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Scam Susceptibility: Determining the Dominant Factor for an Adolescent's Decision-making

Arianna Guerra[1] and Kelly Taylor[#]

[1]Antioch Community High School, Antioch, IL, USA
[#]Advisor

ABSTRACT

This research seeks to investigate the dominant factor in adolescent scam susceptibility using personality type–assessed by the NERIS type explorer–and income. The data consisted of 73 participants, all of whom were utilized for income, while 52 were analyzed for their personality type, from a suburban high school. Each individual accessed an online survey where they differentiated between genuine and scam emails through a multiple-choice question, followed by a free-response question to express their reasoning behind their decisions. Findings revealed that income exhibited a significant effect on scam vulnerability, while personality does not; however, qualitative data suggests that personality may influence one's perception of scams. Through this study, governmental intervention programs can be implemented to garner greater awareness of scams to educate people.

Introduction

In this day and age, due to our dependency on the internet, there has been a heavy reliance on malware-detecting software to keep us safe. Unfortunately, this software is not infallible as 90% of the world is still vulnerable to a type of fraud called phishing (Fatima et al., 2019; Kleitman et al., 2018). Phishing is when the attacker attempts to gain confidential or financial information through email. With the familiarity of the internet, scammers have become sophisticated to outsmart consumers (Gavett et al., 2017). The greater authenticity of a phisher's email design, the more cooperating a victim may be to accept the scam (Williams & Polage, 2018).

The Federal Trade Commission (FTC) finds many cases ranging from a relative needing help, to false claims of being the government (FTC, 2019). The diversity in the types of complaints shows that the deceiver is not limited to one category of fraud but can choose from multiple forms. As such, it becomes difficult for federal authorities to detect specific patterns in email designs of scams to create a warning system. The intricate and detailed work that goes into creating scams is said to be equal to the effort needed to produce a skillful piece of art that fascinates its observers (Pendas, 2018). The overall growing reports of phishing scams—more than thirteen times—since the year 2000, are due to the romanticization of these practices (FTC, 2008; FTC, 2019; Pendas, 2018).

In a scam study by Williams and Polage, to an extent, truth bias was prevalent in people. Truth bias is the belief that something is legitimate unless given a reason not to (Williams & Polage, 2018). Through this train of thought, many fall victim to phishing since their success relies on lapses in judgment (Jones et al., 2019). As a result, many researchers have inquired about the factors that may contribute to susceptibility in scams. They find that endogenous, which are innate in each individual, and exogenous factors, which are uncontrollable, external factors, are the two driving elements in discovering consumer vulnerability (Lee & Soberon-Ferrer, 1997; Loureiro, 2020).

As experiments on phishing is a somewhat new field, looking into these two contributing factors is vital. Within these factors, individual components can lead to greater vulnerability to scams. While the endogenous factor of personality traits and its effect on decision-making is greatly understood by the research community, personality types have little to no research conducted (Chen et al., 2018; Gavett et al., 2017). For exogenous factors, race and

gender have been studied but seem to have a weaker correlation with susceptibility, whereas income should be explored (Lee & Soberon-Ferrer, 1997). Therefore, looking into personality type and income would be an advantageous approach to explore scam vulnerability.

Literature Review

Before advancing into factors of susceptibility, one must understand its historical role in American society. In addition to the downfall of the American economy from the 1929 stock market crash, law and order declined as high counts of fraud were prevalent during this time (Greif, 2018). Throughout history, this has been the case, and its continuance can be traced to humans' trusting nature. In risky transactions, such as that of fraud, the presence of a seller-advisor (someone who advises the customer poorly for self-gain) can motivate a consumer to participate in making a risky decision (Sevier & Williams, 2018). This same concept can apply virtually, as the scammer abuses the consumer's trusting nature to obtain money.

The increase from 2008 to 2019 in reported fraud from 52% to 53% shows that scams are still present (FTC, 2008; FTC 2019). In alignment with the data, a study conducted with gambling showed that 80% were willing to place bets based on past experiences due to the practice of heuristics. Heuristics use mental shortcuts to make quick decisions based on general assumptions or automatic responses (Bilek et al., 2016). Heuristics lead to misconceptions, as past successes do not always merit future success. In general, heuristics have a serious impact on decision making, but whether they have a positive or negative influence depends on the situation.

Referred in Reitter and Grossklag's study, they looked into heuristics through a risk assessing game where individuals were asked to flip a card based on when they believed the computer would flip it. Subjects with low-risk propensity had uncoordinated movements, while high-risk individuals had peak efficiency that produced better outcomes. Their goal was to guess the computer's movement of the card, and with more experience, the risk-takers shifted their aggressive timing to something more practical, while the low-risk people tended to be late in catching a pattern. In this case, risk was beneficial, as those with a higher cognition used their experiences to learn (Reitter & Grossklags, 2019). The study proved that heuristics is beneficial in some situations, but in scams, the opposite is true as these mental shortcuts create a greater chance of considering scams genuine (Williams & Polage, 2018).

To counteract scams, the implementation of laws has been used for fraud but has not been successful since it can be a tedious process for consumers (Sevier & Williams, 2018). The justification for the process is that many victims do not have direct evidence and only their claims. If they were to receive a solution, it would be a settlement as frauds are considered a white-collared crime, meaning that there is no reason for punishment as it lacks severity as opposed to murder. For the prosecution of major companies, it takes many consumer complaints to establish a pattern and reliability of sources to destroy a reputable company. Because of the procedure, many feel discouraged to act upon fraud, causing the system of disputed intervention to be called "decentralized and nonsystematic" (Steele, 1975). Seeing the limitation of legal help, one must understand how people evaluate emails to understand why phishing emails work and how to stop them.

To begin, looking into the impact of age on susceptibility can provide insight into different age groups. Multiple studies have shown that younger consumers between the ages of 18-25 have a reliance on heuristics, raising less suspiciousness when compared to older adults (Fatima et al., 2019; Gavett et al., 2017; Rodrigo et al., 2018). This observation, though seen through adult studies, can also be applied to adolescents as they are overall risk-averse individuals.

In understanding age as a contributing factor, one must look into the biology of an adolescent. During this stage of life, many undergo physical and psychological changes, especially in the central nervous system. The prefrontal cortex, for example, is responsible for assessing situations and dictating actions (Loureiro, 2020; Rodrigo et al., 2018). In an adolescent, the maturation of the brain suggests that many teens make irrational decisions because of their development. Even if adolescents make mistakes, they are more likely to not learn from them due to the hypoactivation of emotional avoidance in potentially harmful situations (Rodrigo et al., 2018). In other words, most teens

tend to focus on whatever outcome will grant them a greater reward. In a lottery study, Magnetic Resonance Imaging showed that adolescents had a greater sense of reward in the core reward system located in the ventral striatum (Goddings et al., 2019). These results demonstrated that the average adolescent shows bias towards a stronger reward-related system and a weaker harm-avoidance. Therefore, it is vital to look into additional factors that may influence an adolescent's sensitivity to potential rewards, such as that of exogenous and endogenous. With this knowledge, more data surrounding this age group can permit a greater understanding of the effects that neural maturation has on their susceptibility (Goddings et al., 2019; Loureiro, 2020; Rodrigo et al., 2018).

Similarly, the FTC concurs that adolescents are a vulnerable group, as from the 1.7 million reported fraud, young adults made up 33% of those that lost money compared to the 13% lost by older adults (FTC, 2019). In general, financial vulnerability is correlated with low income (Hoffmann & McNair, 2019). Those that are underprivileged are at the greatest risk, as they can be easily manipulated to fraud (Hoffmann & McNair, 2019; Lee & Soberon-Ferrer, 1997). Since most adolescents do not have their own source of income, looking into family income, which averages the money made between 2 or more related people (marriage, sibling, adoption) who live in the same household, can provide a better picture of an exogenous factor that may affect their decision-making.

In regards to endogenous factors, psychological variables have been tested for vulnerability. In many phishing experiments, participants are tested for their discernment of phishing and legitimate emails. Studies have shown that an immediate, intuitive response deriving from emotions, equates to rash decisions that led to more errors compared to those who considered a rational, logical approach to the emails (Jones et al., 2019; Loureiro, 2020). This can be attributed to individuals not foreseeing the consequences, making them risk-averse (Chen et al., 2018; Hoffmann & McNair, 2019). Typically, those that are willing to risk and have a sense of curiosity are more likely to see a legitimate email as phishing, thus getting more incorrect overall.

Conversely, when shown legitimate and fake emails, participants with low impulsivity, introvertedness, and distrust were associated with low susceptibility based on their discernment accuracy (Gavett et al., 2017). Along the same lines, those who use a logical and deliberate approach in assessing scams were more likely to make accurate judgments (Lee & Soberon-Ferrer, 1997; Loureiro, 2020). Therefore, a study that focuses on personality types can be more encompassing of an individual rather than traits (Chen et al., 2018; Goddings et al., 2019; Kleitman et al., 2018).

By combining family income and personality type, it can improve understanding of the factors of individual characteristics from personality types concerning positive or negative financial outcomes (Hoffmann & McNair, 2019). In measuring personality type, the NERIS Type Explorer (NERIS) will be used as it designates each person a personality based on five traits.

In this study, it aims to see how techniques, email design, and noticeable current events impact perceptions of emails on adolescents (Williams & Polage, 2018). Based on complaints, 45% of the money lost to scams came from websites, emails, and mail (FTC, 2019). In accordance, using these forms of communication in evaluating vulnerability can expose students to scam formats, but to have an educative intervention, one must look into researching these factors. Thus a question is raised: using family income and personality type, as assessed by NERIS, which is a dominating factor in an adolescent's scam susceptibility?

Hypothesis

Based on the previous studies, I hypothesize that extroverted individuals (E) with intuitive thinking (N), that use emotions to guide their decisions (F) and are open-minded (P) have a greater chance of being susceptible to scams. For this study, the researcher chose to omit assertiveness (-A) and turbulence (-T) and to only focus on the five traits. In consideration of socioeconomic status, those with the most vulnerable personality type in addition to low income are hypothesized to have the most vulnerability compared to those with high or middle income.

Methods

Participants

This study consisted of 73 participants who were categorized into income levels (5 lower, 48 middle, 20 upper). In assessing personality types, 51 participants were used due to the lack of representation of some personalities. Personality types not represented were omitted from the data, but utilized in income levels, as this research sought to look at both variables separately. From the 16 personality types, 6 were represented (ISFJ, ENFP, INFP, ENFJ, INFJ, and INTJ) based on having more than 5 participants per type.

To gather participants, the researcher sent out a school-wide email to two high schools within the same district. Those with an interest in the study filled out consent forms within the email.

Basis for Method

Personality Types

A widely available personality test for modern researchers, NERIS Type Explorer allows ease of accessibility to all as it is free and in thirty languages. Its use of Big 5 personality traits, along with the acronym format of Myer-Briggs Type Indicator, sets NERIS apart from other personality tests. While Myer-Briggs is more widely known and used by the academic community, it focuses on the Jungian theory that centers on cognitive functions and is challenging to measure (Our Framework, n.d). NERIS uses the sum of the traits to generate a personality type for a more cohesive picture of a person. The test asks respondents to rate to which degree they agree or disagree with a given statement using a scale.

Income Calculator

The income calculator used in this study is the latest updated version as of 2018 from the PEW Research Center (Bennett et al, 2020). While this is two years old, this research only requires an estimate of the participant's financial situation. This test categorizes people into lower, middle, and higher income levels that create consistency among participants and avoids bias that may arise from participants self-reporting their financial status.

Implementation of Chosen Method: Reasoning

In examining an adolescent's susceptibility, a mixed-method design utilized close-ended and free response questions through a Google Forms survey, to assess vulnerability based on their personality type and income level.

For the purpose of this study, using legitimate and phishing emails produce more valid results, especially recreating "deception" through the use of real-life email stimuli (Gavett et al., 2017; Jones et al., 2019; Kleitman et al., 2018; Resnik & Finn, 2017). As such, an online survey was administered to participants where they assessed an email and responded whether they believed it was a scam or legitimate. Through screenshots of such emails, hyperlinks within the emails were not active, ensuring that participants were safe in regards to any potential computer viruses.

As adolescents were the main focus of the study, scams were tailored accordingly. Hence, the researcher narrowed the focus to educational scams that were relevant to adolescents. Since 2018, the Department of Education noticed a drastic increase of over 180% in federal student loan scams (Department of Education, 2019). Therefore, focusing on scholarships and honor societies narrowed the types of scams used and gave students the ability to experience how to distinguish genuine versus falsified emails.

In addition to judging the emails, participants were given a cognitive reflection at the end of each screenshot that looked into their thought process (Bilek et al., 2016; Jones et al., 2019). By having a reflection, participants could list any potential cues that were present in both genuine and phishing emails (Williams & Polage, 2018).

As this study measured both personality type and income level in comparison to the number of correctly identified emails, this approach is a convergent mixed method where the analyzed data is qualitative and quantitative which creates a cohesive picture that could be broadly applicable.

Procedure

Before completing the email judgment task, participants completed a demographic information section embedded into the survey. They were directed to complete the NERIS personality test on their Chromebooks with the link provided for their convenience. With their results, they self-reported their personality type and moved onto the next question in this section.

In the following question, participants were instructed to fill out the income calculator to determine their income level provided via link. In the description of the question, they were asked to only complete step 1 as the following steps looked into race/ethnicity which, for this study, was not necessary. In addition, results regarding their financial status could be obtained without completing the additional steps.

Within the income calculator, participants were asked to fill out questions, to the best of their ability, that included: number of family members, household income without taxes, and state. Because the scope of this study was limited to a small-town high school, participants were directed to click no to metropolitan areas. Once they filled out the calculator, they hit the button "calculate," and the results were given. Returning to the google forms, they selected whether they were lower, middle, or higher income level.

Once completed, participants evaluated screenshots of emails that contained genuine and phishing emails of national honor societies and scholarships. At the end of each screenshot, they reflected on their decisions and explored possible email cues they noticed. Bullet points were acceptable as the researcher wanted a general picture of their decision-making process.

Data Analysis

A chi-square test of independence with an alpha value of $p = .1$ sought to measure the categorical variables of income and personality type to the accuracy of scores to determine a relationship; whether these variables are independent or related to each other. While it is not as statistically significant as an alpha level of $p = .05$, it does provide a 90% confidence level. For the purpose of this research, a null hypothesis that various personalities or income levels bear no weight on the accuracy of scores was utilized. Two contingency tables, where rows were by personality types or income and accuracy arranged in columns, analyzed the data. Each cell contained the total number of individuals in a specific income/personality type per score. Accuracy scores were in categories of low (4 or less), middle (5-6), and high scores (7-8) out of a total score of eight. Because the researcher sought to figure out whether differing personality and income levels affect the accuracy in their scores of analyzing emails, using a chi-square test allowed the analysis of both variables.

For analyzing responses to the open-ended questions, participants were grouped in their personality types through keywords or phrases that occurred two or more times in their responses. Based on whether their responses fell under a scam or legitimate email screenshot, participants were organized into a table. Responses were categorized: positive association, where the response is receptive to accepting the email regardless of whether it was a scam or not; negative association, where the response rejected the email; and neutral association, where both positive and negative associations were present in the responses. Through the use of different associations, the researcher believes that it may be indicative of their trust levels.

While not every response was analyzed or truly representative of the entire sample, their repeated words or phrases provided insight into their personalities and thoughts to genuine and scam emails.

Findings and Analysis

Income v. Personality Types

Table 1. Comparison of income levels and accuracy of scores

Income Levels	Low Score	Middle Score	High Score	
Lower	2/1.23	1/2.6	2/1.16	5
Middle	12/11.84	26/24.99	10/11.18	48
Higher	4/4.93	11/10.41	5/4.66	20
	18	38	17	SAMPLE SIZE: 73

Note. Expected values for scores, located after the forward-slash, were calculated by multiplying the total number of one of the rows and one column, then dividing by the sample size (ie. to solve for the expected value of lower-income, low scoring participants, take the total number of lower-income individuals (5) and multiply by the low score (18) then divide by the sample size of 73).

Table 1 displays the contingency table used in Chi-Square calculations that include the actual and expected values. Using this data from the table, expected and actual values were separated into two matrices to conduct Chi-Square analysis for the impact of different income levels on score accuracy.

In the results, there was a significant relationship between the two variables as X^2 (4, N = 73) = 8.213, p = .08. Since the p-value was less than the alpha level of p = .1, income seemed to be a significant factor in the accuracy of scores, leading to a rejection of the null hypothesis.

Table 2. Comparison of personality types and accuracy of scores

Personality Types	Low Score	Middle Score	High Score	
INFJ	2/2.75	7/5.1	1/2.16	10
ENFJ	3/2.75	3/5.1	4/2.16	10
INFP	3/1.92	3/3.57	1/1.51	7
ENFP	3/2.47	5/4.59	1/1.94	9
ISFJ	2/2.75	6/5.1	2/2.16	10
INTJ	1/1.37	2/2.55	2/1.08	5
	14	26	11	SAMPLE SIZE: 51

Table 2 displays a contingency table with personality types in addition to the correctness of participant's scores.

In the results, there was an insignificant relationship between the two variables as $X^2(10, N = 51) = 6.849$, $p = .74$. Since the p-value was greater than the alpha level of p = .1, the null hypothesis that personality types will not affect the accuracy of scores is accepted.

Table 3. INFJ (advocate) key words/phrases

	Scam	**Legitimate**
Participant 1	Money	Detailed information
Participant 2	Formal Signature Short	Specific details
Participant 3	Short	Bolded words Professional
Participant 4	Prior experience (real/scam)	Specific details
Participant 5	Signature Logo Informal	Seems legitimate
Participant 6	Asking for suspicious information	Details (yes/no)
Participant 7	Short	Professionalism (yes/no)
Participant 8	Prior experience Money	Detailed information
Participant 9	Signature Logo	Unprofessional Specific details
Participant 10	Money	Unprofessional
Overall		

Positive Association Neutral Association Negative Association

Table 3 shows the responses of participants in the INFJ personality type. In the scam column, advocates proved to have a general distrustful view of scams, as seen by the majority that viewed scams with a negative association. Deeper into the scam category, three INFJ's saw a negative association in the inquisition of money and a lack of a signature present in the email. On the other hand, legitimate emails seemed to have an overall positive association

by most advocates. Six INFJ's found that detailed information made the email seem trustworthy whereas the lack of information seemed fraudulent.

Across both email types, six participants found that the formality of the emails and specific information played an important role in their distinction between legitimate and scam emails.

Table 4. ENFJ (protagonist) key words/phrases

	Scam	**Legitimate**
Participant 1	Prior experience	Prior experience
Participant 2	Information	Full-ride scholarship not realistic Prior experience
Participant 3	Asks for personal information Brief	Important information
Participant 4	Vague detailing	Real organization
Participant 5	Information Vague	Prior experience Contact information (yes/no)
Participant 6	Very detailed (ie logo)	Links
Participant 7	Looks weird	Too personal
Participant 8	Short	Provides information
Participant 9	Short	Detailed information
Participant 10	Signature	Time & dates Signature
Overall		

Positive Association Neutral Association Negative Association

Table 4 presents the responses of participants in the ENFJ personality type. In the scam column, protagonists proved to have a generally skeptical view of scams, as many viewed scams with a negative association. Within the scam category, a negative association was linked with lack of information and personalization of an email by five protagonists. Conversely, legitimate emails had an overall positive association by many. Of that group, five ENFJ's found specific information in the email made it seem authentic.

In both email types, eight protagonists observed that having access to detailed information played a significant role in their differentiation of genuine and scam emails.

Table 5. INFP (mediator) key words/phrases

	Scam	Legitimate
Participant 1	Seeking money	Personal, yet formal
Participant 2	Detailed information	School organization
Participant 3	Detailed information Many links	Specific information
Participant 4	Brief Specific information	General information Specific information
Participant 5	Formal language	Specific information
Participant 6	Links	Informative
Participant 7	Signatures	Too personal
Overall		

Positive Association Neutral Association Negative Association

Table 5 exhibits the responses of participants in the INFP personality type. In the scam column, mediators were fairly certain that scams were genuine, as numerous INFP's viewed scams with a positive association. Specifically, a positive association was related to detailed information by three mediators in scam emails. Similarly, legitimate emails seemed to have an overall positive association by most participants. Of that group, four participants found that specific information made the email reliable.

Across both email types, five participants found that additional/absent information played a valuable role in their distinction of legitimate and scam emails.

Table 6. ENFP (campaigner) key words/phrases

	Scam	Legitimate
Participant 1	Member testimonies	Professional Specific details
Participant 2	Prior research	Prior research
Participant 3	No additional information	Exact dates & time
Participant 4	Signature & watermarked	Specifical details

Participant 5	Accurate information	Detailed information
Participant 6	Too good to be true	Detailed requirements
Participant 7	Short Lack of information	Prior research
Participant 8	Signature Lack of details	Generic format (Yes/no)
Participant 9	Thorough description Seems sketchy	Doesn't ask for money
Overall		

Positive Association Neutral Association Negative Association

Table 6 shows the responses of participants in the ENFP personality type. In the scam column, campaigners were fairly certain that scams were unreliable, as the majority viewed scams with a negative association. For example, five campaigners noted the inadequacy of information as distrustful. By contrast, authentic emails seemed to have an overall positive association by most participants. Six participants noticed that specific information made the email seem reliable.

Across both email types, eight participants found that supplementary/missing information played a notable role in their perception of legitimate and scam emails.

Table 7. ISFJ (defender) key words/phrases

	Scam	**Legitimate**
Participant 1	Money deposit	Detailed information
Participant 2	Signature Lack of information	Specific information
Participant 3	Detailed dates Not detailed information	Detailed information
Participant 4	Short No information	Very generic
Participant 5	Access bank information Vague on details	Detailed information
Participant 6	Professional sounding Short	Unprofessional language Seemed reliable

Participant 7	Signature & dated No contact information	No contact information
Participant 8	Signature (yes/no)	Detailed information
Participant 9	Asking for money	No mention of money
Participant 10	Too vague	Encourages contact Has deadlines
Overall		

Positive Association Neutral Association Negative Association

Table 7 shows the responses of participants in the ISFJ personality type. In the scam column, defenders were fairly mixed in their responses, landing into a more neutral association. Six ISFJ's viewed the absence of specified information correlated with a negative association. Similarly, legitimate emails seemed to have an overall positive association by most defenders. Seven ISFJ's found that specific information made the email reliable.

Across both email types, eight participants saw that additional/absent information played a valuable role in their discernment between legitimate and scam emails.

Table 8. INTJ (architect) key words/phrases

	Scam	**Legitimate**
Participant 1	Plenty of information Trustable links	Website & information
Participant 2	Looks reputable	Notable organization
Participant 3	Formatting weird	Helpful information Formal, yet personal tone
Participant 4	No information Deposit money	Official-looking
Participant 5	Membership fee	Detailed information Gives a timeline (dated)
Overall		

Positive Association Neutral Association Negative Association

Table 8 shows the responses of participants in the INTJ personality type. In the scam column, architects proved to have a general suspicious view of scams, as many observed scams with a negative association. Three architects found that the formatting of the email weighed heavily on their decisions. If the email contained grammatical errors, it was held in a negative light while links were considered genuine. By contrast, all participants found legitimate emails to have an overall positive association. Three participants found that detailed information made the email appear authentic.

Across both email types, four participants found that having information played a principal role in their distinction between legitimate and scam emails.

Discussion

Chi-Square Analysis

In regards to various income groups, the rejection of the null hypothesis proves that the exogenous factor has a significant impact on scam susceptibility while the endogenous factor of personality types does not affect vulnerability. The Chi-Square analysis elucidates that the financial aspect has a considerable impact on an adolescent's vulnerability when compared to personality types.

While the sample size was not diverse in terms of having all 16 personality types and an equal number of participants in both variables, the findings are significant since they provide insight into these two driving factors of consumer vulnerability.

Response Analysis

Dissecting the responses, advocates (INFJ) were overall suspicious of scams while being more receptive to genuine emails. In line with their behavior, advocates are typically insightful people who can distinguish true motives and tend to be perfectionists, finding any or nonexistent flaws. In this case, INFJ's were at an advantage in differentiating emails successfully (Our Framework, n.d).

60% of advocates considered the use of first-person dialogue to be informal, while third-person relayed professionalism. Moreover, specific information, such as dates and time, also served as important markers to INFJ's that are prevalent in their personality type.

Similarly, their extroverted counterparts, protagonists (ENFJ), are acutely aware of scams and legitimate emails, perceiving with caution and openness, respectively. 80% of protagonists encountered detailed information of the program or scholarship to provide them insight into making their final decision. Their choice aligns with their personality type as ENFJ's are known to be charismatic individuals who are receptive towards mood or motivation (Our Framework, n.d). While protagonists struggle to make decisions, as a collective, they can successfully discern emails.

In the case of mediators (INFP), they were unsuccessful in recognizing the differences in emails as they were responsive towards both email groups. Their failure to identify scams is attributed to their open-mindedness as mediators grant people the benefit of the doubt, making this group an easy target for their naivety (Our Framework, n.d). When classifying emails, 71% of INFP's believe that additional information in an email is trustworthy, while the absence of such information is considered a false email. While the past two personality types were successful in using detailed information to their advantage, the mediators' trusting nature led them to fail in seeing the warning signs of membership fees and links hidden in the emails.

For campaigners (ENFP), they were able to identify the emails accurately. Known to be curious individuals, campaigners tend to not hesitate in their decisions, making themselves quite comfortable with being out of their comfort zone. While this trait is associated with scam susceptibility, ENFP's use their skill of observation to satiate this

desire for curiosity through a keen awareness of their surroundings (Our Framework, n.d). In the emails, 89% of campaigners view supplemental information as a vital part of email trustworthiness, while missing information interconnects to a scam email.

In judging emails, defenders (ISFJ) were able to identify legitimate emails correctly, but in scams, they were neutral, where their responses were a blend of distrust and credulity. Their neutrality in scams, which only occurs in the defender group, is no surprise as they overload their need for perfection, meaning that they will use their observant nature to point out any flaw, whether present or not. In their responses, 80% of ISFJ's found that additional and the absence of information played a valuable role in their assessment of legitimate and scam emails (Our Framework, n.d). Their rationale derives from being patient individuals that take a steady approach in their decisions. While table 7 displays that many correctly identified the amount of information as a measure of credibility in emails, those falling into the neutral zone tended to fall into traps where they found other factors that made the scams seem reliable, but were not.

In the last personality type studied, architects (INTJ) were overall able to correctly identify scams and genuine emails based on their responses. Architects, being informed individuals, tend to find evidence to expand their knowledge to make rational decisions. 80% of INTJ's focused on the given information in the email to make their decisions (Our Framework, n.d). While they are known to be curious individuals, architects only act on their instincts if there is reasoning to back their ideas.

Quantitatively, the results did not show any significant difference between the accuracy of being able to identify scams in personality, however, it is clear that personality potentially influences their perception of whether or not they trust a scam based on their replies.

Generally speaking, responses used heuristics, relying on the quantity of information given in the email rather than other factors, such as the presence of signatures. Their train of thoughts appeared to be influenced by their personality traits, and contrary to Williams and Polage's study, the results yielded positive effects. INFJ's, ENFJ's, ENFP's, and INsTJ's used the information to make accurate decisions, but INFP's and ISFJ's used the same cues but ended up victimized (Williams & Polage, 2018). Despite using the same cues in emails, the results had differing outcomes, proving that heuristics, even in the same situation, tend to have different effects depending on the individual, or in this case, personality type.

Conclusion

This study focused on discovering a dominant factor in an adolescent's scam susceptibility using familial income and NERIS personality types to represent exogenous and endogenous factors, respectively. Through research, the exogenous factor exhibited a significant effect on scam vulnerability unlike the endogenous factor. While personality type was not a significant predictor of scam responsiveness, examining the mental processes provided acuity. Mediators (INFP), in specific, were the most receptive to scams, followed by defenders (ISFJ), who were on the untrusting-trusting border with scams.

Limitations

Due to the unbalanced sample size within each factor, researchers should consider the research in need of further evaluation. The inquiry consisted of 73 participants, but only 51 individuals were assessed for personality types based on the number of individuals found in each. Based on the outcome of the quantitative data, it has the possibility of not being explicative of the phenomenon occurring between the endogenous and exogenous factors. Furthermore, the research failed to identify the extent that income played a role in scam susceptibility, focusing more on the generality of income having an effect rather than a specific category within (i.e. middle income). As a result, the qualitative data

provides insight into possible thought processes of different personality types. Responses further presented adolescents the opportunity of reflecting on their decisions, allowing a long-term improvement in their action-control system in the brain to reinforce less impulsivity (Hoffmann & McNair, 2019; Rodrigo et al., 2018). For further investigation, a larger sample size with equal representation of personality type and income would merit better research.

Implications

While an uneven distribution of the sample size was present in the factors studied, the research still illuminates auspicious information on consumer vulnerability for government officials and those victimized.

Using income susceptibility and statements from personality types, the results can be utilized in training against phishing and help companies tailor phishing awareness programs (Gavett et al., 2017). In schools, simple educational interventions, such as a security quiz that uses fake and genuine emails, may reduce vulnerability to scams by increasing cognizance among adolescents. Nationally, this information is instrumental to the FTC, allowing them to create helpful resources for law enforcement agencies to protect citizens from scams.

Call for Future Research

Based on the lack of diversity in the factors, prospective researchers should examine all 16 NERIS types to see if they contain some level of susceptibility similar to INTP and ISFJ typologies to make broader statements regarding adolescents for greater comprehension.

Since this study focused on two specific examples, other factors should be explored since many combinations of exogenous and endogenous factors exist and may play into susceptibility (Lee & Soberon-Ferrer, 1997; Loureiro, 2020). Regardless, the experience of distinguishing emails can protect individuals from future vulnerability.

Nationally, adolescents make up a small percentage of cumulative scams; however, education to students is imperative to understand the harms that may arise from susceptibility (loss of money). While this study focuses on educational scams, it applies to general scams as they are formulaic with minor differences in target audiences and email design. By raising awareness, adolescents can see how scammers target individuals to produce the maximum damage. As shown in this study, the presentation of scams can be a preventative measure where the results can provide insight and understanding into the psychology behind scams. With that knowledge, researchers and government officials can collaborate to create intervention programs aimed to reduce the overall statistics of those scammed and money lost nationally.

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