Cyber-victimization Trends In Trinidad & Tobago: The Results Of An Empirical Research

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INTRODUCTION

The Problem
Research into cybercrime victimization is still scarce although cybercrime is increasing rapidly within the Caribbean and Latin America regions[1,2]
- Increasing frequency and sophistication of cyber-attacks in the Caribbean[3]
- T & T Police Service Media Reports
  - 2018: loss of TTD 14.5 M due to credit fraud
  - 2019: increase in incidents of Online Harassment and Cyber-bullying

Routine Activities Theory (RAT)
- The RAT was chosen for this study because it has been successfully applied in the examination of cybercrime victimization[4,5]
- Further, comparison to previous research will be more intuitive given the same theoretical base for the identification of independent variables was used.
- Provides a framework easily transferable to policy (see Table 1)

Table 1. Tenet of RAT and its relation to crime policy

Routine Activity Theory	Situational Crime Prevention
A likely offender	Reduce the number of likely offenders
A suitable target	Harden prospective targets
The absence of a capable guardian against the offense	Increase capability and/or number of guardians

Facebook as a Target Population
- 715 500 Facebook users in Trinidad and Tobago in June 2019, which accounted for 51.9% of the country's population[6,7]
- Facebook allows access to large and diverse samples of persons in their natural environment while being parsimonious[8]
- Facebook could potentially address the issue of overreliance on samples based on secondary data, or student populations in past research[9]

Contribution
This research contributes to the existing literature and the understanding of cybercrime in three ways:
1) It identifies the activities that contribute to two forms of cybercrime victimization and developing risk models for these crimes, and
2) It explores the similarities and differences in factors that lead to victimization in Trinidad and Tobago in relation to past studies in North America and Europe.
3) It contributes much needed data on cybercrime victimization within Trinidad and Tobago to deepen situational awareness and encourage future research

METHODOLOGY

Aims of the Study
- To identify cybercrime patterns among Facebook users in Trinidad and Tobago
- To investigate the human-centric factors associated with two forms of cybercrime victimization

Sample / Data Collection

Sample (94)
- G*Power
  - 80 - 164 data points for a medium-small effect; Power = 80, α = 0.05

Independent Variables
- Target Accessibility
- Internet browsing hours, online shopping hours, social media hours, watching adult content and downloading music or videos

- Target Exposure
- (nonverbal communication such as pictures posted of self, posting of personal information, and/or direct sharing of this information with persons online

- Guardianship
- Physical/Technical (e.g. antivirus)
- Personal (awareness)

Dependent Variables
- Cyber-dependent: Unauthorized Access
- Cyber-enabled: Cyberbullying

Demographics
- Age
- Sex
- Ethnicity

Analysis
- Random Forest
  - Effective visualization of interrelationships and the cumulative effect of predictors on the responses
  - Can deal with "small n large p"-problems, high-order interactions, correlated predictor variables, unbalanced data sets, and is generally unsurpassed among current algorithms10
- Logistic Regression
  - indicates the size & direction of the effect on the outcome variable

RESULTS

Cybercrime victimization rate
- **Unauthorized Access**
  - **34%**
- **Cyberbullying**
  - **18%**

Sex Differences
- For both unauthorized access and cyberbullying female participants were twice as likely to report victimization than their male counterparts.
  - Cyberbullying was twice as prevalent among females

Age Differences
- Cases of cyberbullying were particularly high among persons in the "15-24" age group.
- For unauthorized access the occurrences were spread among the age groups observed.
  - However, the age group of "45-54" showed the highest relative prevalence with 82% of the persons within that age bracket reporting victimization.

Classification Modelling
- **Unauthorized Access**
- Model Performance: Accuracy = 59%; F1-Score = 0.222 ; AUC = 0.588
- Target exposure increased risk of victimization
  - Posting personal information online
  - Posting location online
- Use of antivirus software reduced risk of victimization
- Demographic factors
  - Sex had the greatest effect on victimization (8-fold greater risk by females)
- **Cyberbullying**
- Model Performance: Accuracy = 94%; F1-Score = 0.8 ; AUC = 0.750
- Target Exposure and Target Accessibility increased risk of victimization
  - posting personal information online (increased risk 6-fold)
  - social media hours
- Technical guardianship measures of spam filters and pop-up blockers reduced risk of cyberbullying
- Demographic factors
  - Female were at 4 times the risk of males for cyberbullying
  - The most at risk age group was "25-34"

CONCLUSION

The RAT has a higher utility in relation to cyberbullying than unauthorized access victimization
- The RAT may be better suited for cyber-dependent crimes than cyber-enabled crimes
- Findings suggest that the RAT may have different explanatory capability depending on the category of cybercrime.

Technical Guardianship measures have some utility in the mitigation of cybercrime victimization, however, spectrum of such solutions may be necessary for holistic protection

Posting of personal information online exposes users to victimization as it increases target suitability both from a Target Congruence Theory and a Victim Facilitation perspective

Simply increasing time spent online is not necessarily risk causing, rather the activity or the 'location' of activity is the important factor
- This is possibly inline with the Deviant Places Theory, which states an individual is more likely to become the victim of a crime when exposed to dangerous areas

Demographic factors are important in determining risk of cybercrime victimization
- Demographic factors may have a constraining effect on online activities, similar to their effect in relation to conventional crime[11,12]
- Females are at a generally higher risk of victimization possibly due to higher levels of engagement online

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