

Predicting Phishing Victimization: Roles of Protective and Vulnerable Strategies and Decision-Making Styles

Eric Chan-Tin, Loretta Stalans, Spencer Johnston,
Daisy Reyes, Shelia Kennison

SNTA 2022





Click to Support Reducing Deaths from Cancer



International Cancer Foundation <intcancerfoundation...>

Wed, Oct 2, 2019, 2:13 PM



Reply



to me ▾

Images are not displayed.

[Display images below - Always display images from intcancerfoundation@gmail.com](#)

Hello there!

As a Loyola student, are you concerned about social justice enough to take a second to help? If you click [here](#), JT Morgan Inc. will donate \$10 to the International Cancer Foundation (or another charity of your choice). Death from cancer has declined 26% since 1991, but the economically disadvantaged have much higher death rates.

Thank you for your support of reducing cancer death rates for the disadvantaged or your preferred charity. Every click matters.

International Cancer Foundation

Goal: Predict Phishing Success

- Based on
 - Decision-making style
 - Vulnerable/protective strategies
 - Previous victimization

Decision-Making Styles

- Systematic
- Self-control
- Avoidant

Protective Strategies

- Check sender email address
- Check URL
- Use spam filters
- Delete unknown emails

Vulnerable Strategies

- Click on links
- Visit websites despite warning
- Download software without paying attention

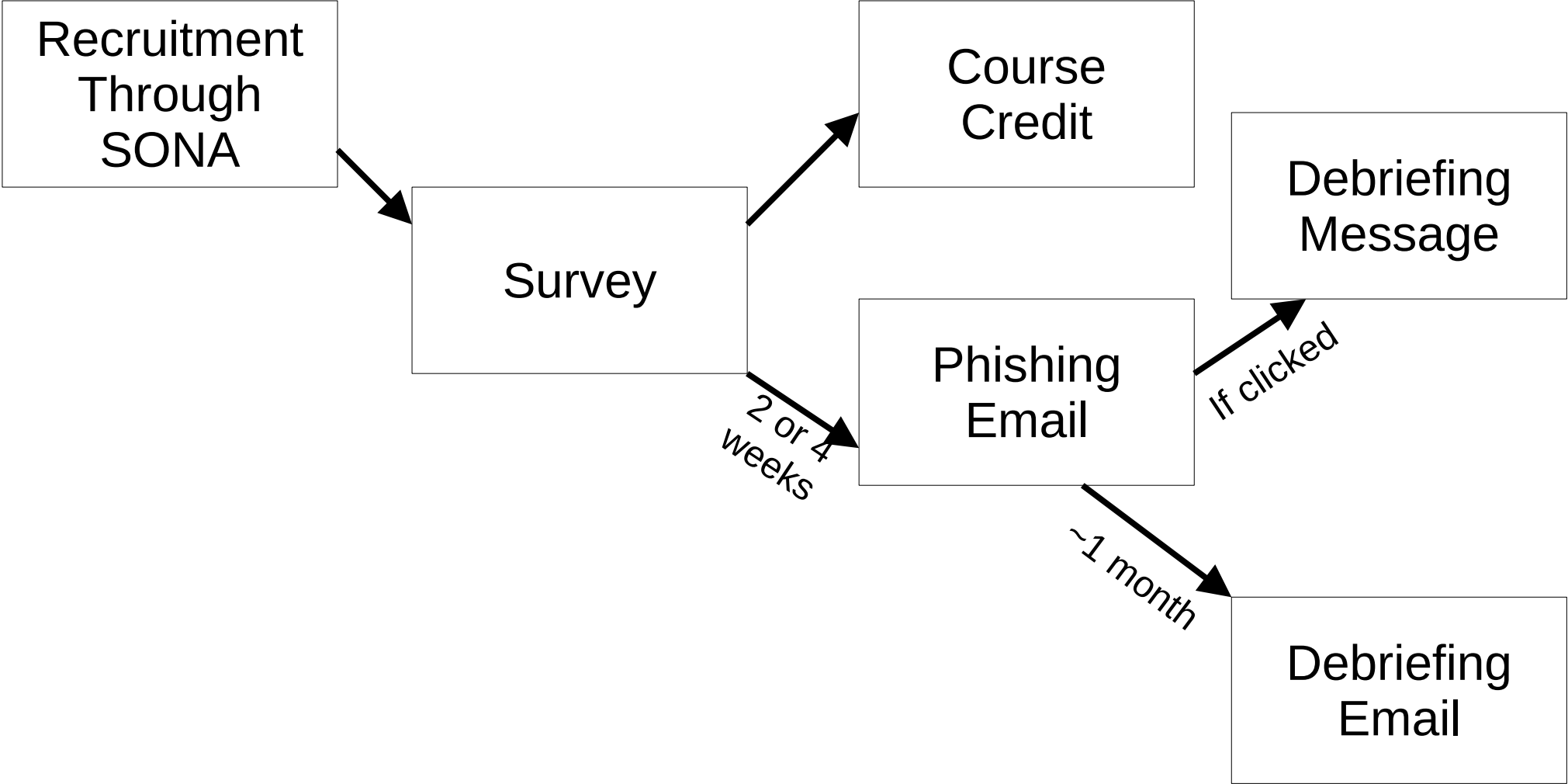
Victimization

- Catphishing
- Identity theft
- Phishing

- Novelty – from previous work
- Survey then Phishing

Hypotheses

- 1) Systematic decision-making style and protective strategies reduces the likelihood of being phished
- 2) Individuals with vulnerable strategies such as clicking on links, and those with greater general trust would have a higher likelihood of being phished
- 3) Individuals with avoidant decision styles, which are often associated with anxiety, would be more likely to have vulnerable strategies



Survey

- Use of email
- Behavioral strategies
- Decision-making thinking styles
- Self-control
- Trust in people
- Previous victimization

Click to Support Reducing Deaths from Cancer



International Cancer Foundation <intcancerfoundation... Wed, Oct 2, 2019, 2:13 PM



← Reply



to me ▾

Images are not displayed.

[Display images below - Always display images from intcancerfoundation@gmail.com](#)

Hello there!

As a Loyola student, are you concerned about social justice enough to take a second to help? If you click [here](#), JT Morgan Inc. will donate \$10 to the International Cancer Foundation (or another charity of your choice). Death from cancer has declined 26% since 1991, but the economically disadvantaged have much higher death rates.

Thank you for your support of reducing cancer death rates for the disadvantaged or your preferred charity. Every click matters.

International Cancer Foundation

Tracking

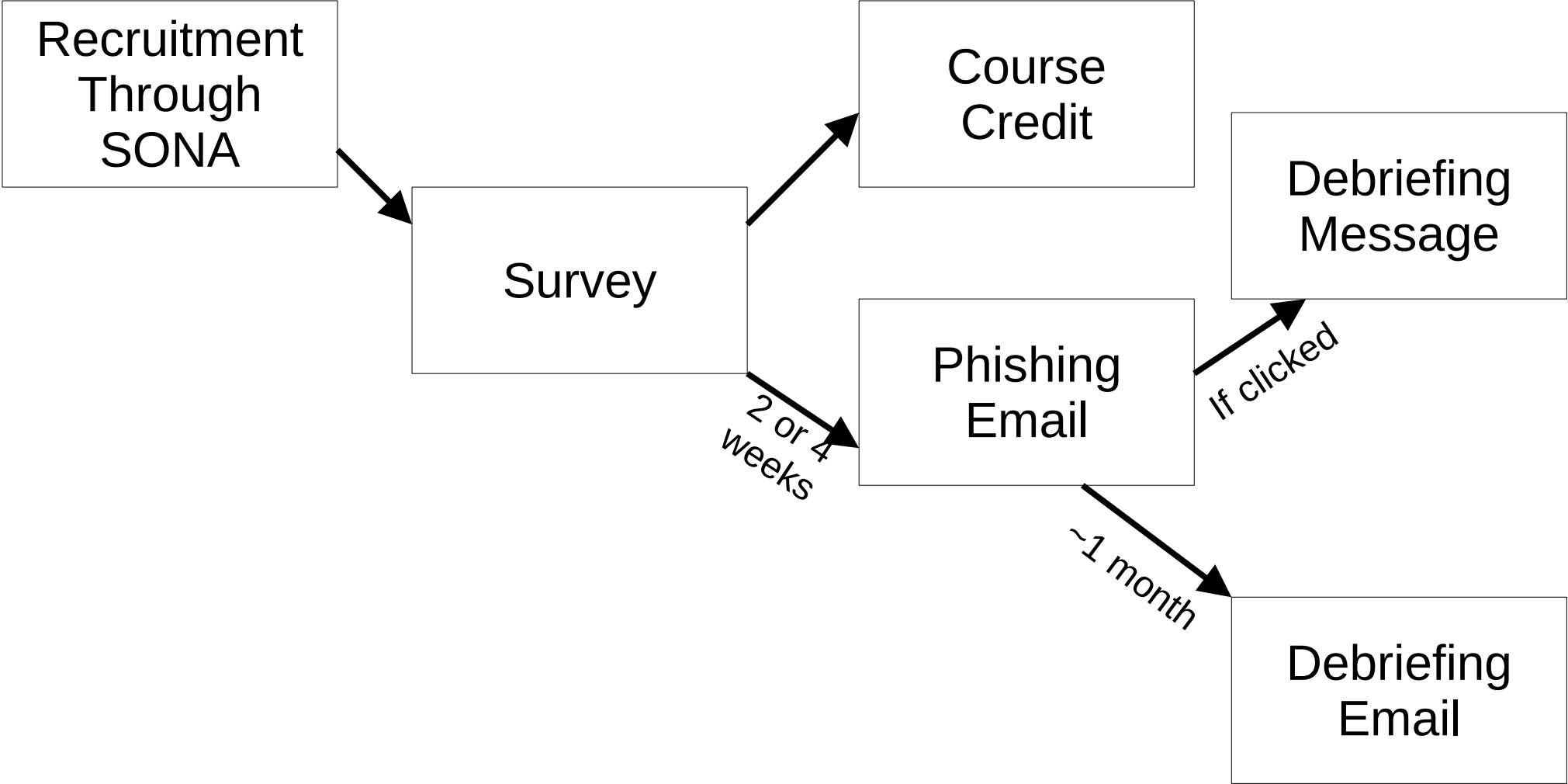
- 1x1 invisible pixel in each email
- Link is unique to each participant

Track

1) View email

2) Click on link

3) Submit information on webpage



Participants

- 327 college students
- 84% women
- 62.5% first year and 24.5% sophomore
- Mean age: 18.87
- 60.8% White, 19.9% Asian, 14.5% Latinx, 3.9% Black, 0.6% Native American

Results

- IRB approval
- 327 responses
- 128 viewed email
- 23 clicked on link
- 20 submitted information

Results

- Systematic decision-making style → greater number of protective strategies, but not vulnerable strategies
- Avoidant decision styles more likely to have vulnerable strategies
- Use of dating apps → greater number of vulnerable strategies

Results

- Greater number of protective strategies → less likely to be victim
- Vulnerable strategies unrelated to victimization
- High avoidant decision-making styles → 1.41 times more likely to be victim than those with low avoidant
- More trust in people → less likely to be victims
- Lower self-control → more likely to be victims

Results

- High avoidant style and systematic thinking or lower trust in people → less likely to click
- Low avoidant style and greater number of vulnerable strategies → 11.6 times more likely to click
- Previous victimization != less likely to click

Which Hypotheses Confirmed?

- 1) Systematic decision-making style and protective strategies reduces the likelihood of being phished
- 2) Individuals with vulnerable strategies such as clicking on links, and those with greater general trust would have a higher likelihood of being phished
- 3) Individuals with avoidant decision styles, which are often associated with anxiety, would be more likely to have vulnerable strategies

Future Work

- More diverse population than college students
- Different types of phishing email
 - Authority, urgency

Summary

- Recruitment → Survey → Phishing Email → Debriefing
- Found some surprising correlations

Thank you!

- Contact: chantin@cs.luc.edu

