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Negative Effects of Social Triggers on User Security and Privacy Behaviors

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Background

- Many previous studies have focused on **positive** aspects of social effects on user security and privacy (S&P) behaviors.
 - e.g., non-expert users learn lessons from S&P stories from others such as family, friends, and colleagues.
- Das et al. showed that social triggers were more common than proactive and forced triggers when it came to users S&P behaviors.

Problem

- Researchers should not turn away from the **negative** aspects of social effects.
 - i.e., the possibility that non-expert users may be encouraged by others to engage in risky or insecure behaviors.
- Not enough systematic research has been done on the negative aspects, as opposed to the positive aspects.

To understand triggers for risky user behaviors, we arranged Das et al.'s questionnaire that investigated social triggers for user S&P behaviors.

Research Questions

RQ1: How frequent are the social triggers for *risky* user behaviors?

RQ2: By whom are users triggered to engage in *risky* behaviors?

RQ3: What are the factors of the social triggers for *risky* user behaviors?

RQ4: How often and why do users share their *risky* behaviors with others?

Method: online survey about user risky behaviour

The six potentially risky behaviors we focus on:

- **Public Wifi:** Connecting to an unknown, potentially unsecured public Wi-Fi and then engaging in sensitive data exchanges, such as transmitting credit card or password details through this connection.
- **Pwd Reuse:** Reusing the same or similar passwords for different accounts.
- **Illegal DL:** Downloading illegal or unofficial software/applications and media (e.g., videos, music, and games).
- **Delayed Update:** Ignoring or delaying software/application updates.
- **Sensitive Post:** Sharing sensitive personal information online (e.g., location-based information, real-time activities, and pictures of yourself/others) to strangers on social media.
- **Account Sharing:** Sharing accounts with family, friends or others.

Method: online survey about user risky behaviour

Participants were also asked:

- **Whether they engaged in the risky behaviors:** (if they did) the triggers of each behavior in the past 6 months.
 - Social trigger: observation of others or advice from others
 - Organizational trigger: request from their organization
 - Voluntary: no experience with social or organizational triggers
- **Reason they did/didn't engage in the risky behaviors**
- **Whether they shared their risky behaviors**
- **Expectations of others' risky behaviors:** what percentage of the public they thought engaged in each risky behavior.
- **Security attitudes:** SA-6 known as the security attitudes scale (*Faklaris, 2019*).
- **Demographics:** e.g., age and identified gender.

Recruitment and instruction

Instruction: To reduce the social desirability bias, we told participants that we did not consider engaging in risky behaviors to be bad or uncommon and requested honest responses.

Recruitment: We used the representative sample tool (U.S. Census) of Prolific. We obtained a total of **417** valid responses after attention checks and data validation.

RQ1: How frequent are the social triggers for risky user behaviors?

Frequency of behavioral triggers for each behavior

Behavioral Triggers		Public Wi-Fi	Pwd Reuse	Illegal DL	Delayed Update	Sensitive Post	Account Sharing	All
		N=68 (16.3%)	N=297 (71.2%)	N=76 (18.2%)	N=225 (61.2%)	N=76 (18.2%)	N=135 (32.4%)	
Social	Observation	33.8%	17.5%	48.7%	14.1%	26.3%	35.6%	23.8%
	Advice	4.4%	1.3%	13.2%	5.5%	10.5%	17.0%	6.8%
Organizational		8.8%	3.0%	1.3%	2.7%	6.6%	2.2%	3.4%
Voluntary		61.8%	79.8%	47.4%	78.8%	63.2%	52.6%	70.0%

Non-negligible percentage (approx. 20-50%) of participants experienced social triggers

RQ2: By whom are users triggered to engage
in risky behaviors?

Person who triggered the participants' behavior

	Public Wifi (N=23)	Pwd Reuse (N=52)	Illegal DL (N=37)	Delayed Update (N=36)	Sensitive Post (N=20)	Account Sharing (N=48)	All
Friend	65.2%	65.4%	70.3%	47.2%	80.0%	64.6%	64.4%
Family	39.1%	55.8%	16.2%	38.9%	55.0%	77.1%	49.1%
Stranger/Online posts	30.4%	34.6%	67.6%	36.1%	40.0%	25.0%	38.4%
Colleague	52.2%	26.9%	18.9%	27.8%	20.0%	20.8%	26.4%
Media	21.7%	13.5%	10.8%	11.1%	15.0%	12.5%	13.5%
Influencer	13.0%	5.8%	10.8%	8.3%	25.0%	8.3%	10.2%
Teacher/Mentor	4.3%	3.8%	2.7%	0.0%	5.0%	4.2%	3.2%

- Users are primarily triggered by friends, family, and online strangers.
- Younger participants were more likely to be triggered by online strangers.

RQ3: What are the factors of the social triggers for risky user behaviors?

Factors of socially-triggered risky behaviors

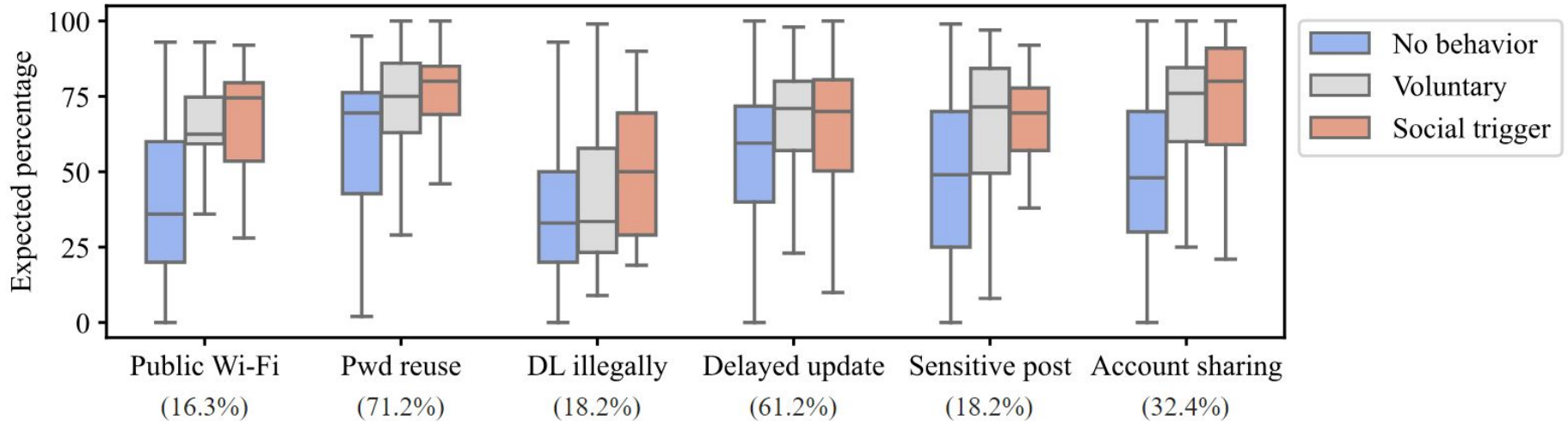
- While individual demographics (age, gender and SA-6) were significantly correlated with the likelihood of risky behaviors, they were less correlated with the likelihood of social triggers.
- The type of risky behavior was significantly correlated with the likelihood of social triggers; account sharing and illegal downloading are often caused by social triggers.

Logistic regressions for risky behaviors and social triggers (coefficients and p-values).

	Social Trigger	Risky Behavior
Age	- 0.001	- 0.050 ***
Male (vs Female)	0.334	0.420 *
SA-6	0.068 *	- 0.099 ***
DL (vs Pwd)	2.503 ***	
Account (vs Pwd)	2.139 ***	
Update (vs DL)	- 2.424 ***	
Account (vs Update)	2.060 ***	

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001

Expectations of others' risky behaviors



- Behavior Groups expected a higher percentage than the No-Behavior Group.
- Social-trigger Group had a higher median than the Voluntary Group.

RQ4: How often and why do users share their risky behaviors with others?

Frequency of sharing

	Public Wifi (N=68)	Pwd Reuse (N=297)	Illegal DL (N=76)	Delayed Update (N=255)	Sensitive Post (N=76)	Account Sharing (N=135)	All
Overall shared	26.5%	24.2%	52.6%	27.2%	46.1%	80.7%	37.8%
Family	55.6%	70.8%	40.0%	53.6%	48.6%	86.2%	65.6%
Friend	50.0%	45.8%	77.5%	39.1%	51.4%	47.7%	49.6%
Colleague	38.9%	6.9%	5.0%	21.7%	11.4%	7.3%	12.0%
Online discussion	11.1%	2.8%	10.0%	11.6%	28.6%	1.8%	8.2%

- On average, 37.8% of risky behaviors were shared with others.
- Participants mostly shared behaviors with family and friends.

Reason and factors of sharing

- We found that participants predominantly (41.7%) shared their risky behaviours to share the perceived benefits.
- We found significant correlations between user sharing practices and the type of risky behaviors. Account sharing, illegal downloading were more likely to be shared, followed by sensitive post.
- If a participant engaged in risky behavior due to social triggers, they were more likely to share it with others (i.e., **negative social chains**).

Logistic regression for sharing practices

	Coeff
Age	0.004
Male (vs Female)	- 0.231
SA-6	0.024
Account (vs Wi-Fi)	2.794 ***
Account (vs Pwd)	2.833 ***
Account (vs DL)	1.684 *
Account (vs Update)	2.696 ***
Account (vs Post)	1.997 **
Social Trigger	2.062 ***

Recommendations

- **Interventions on online platforms:**

- **[Finding]** Participants were often triggered by online strangers/influencers.
- Online platforms should strengthen their guidelines regarding posts that report risky behaviors and present warnings for such posts.

- **Removal of expectation that most of public engages in risky behavior:**

- **[Finding]** Participants engaging in a risky behavior (by social triggers) had such expectation.
- Present the percentage of security experts who would not engage in a risky behavior.

Recommendations

- **Security education with emphasis on risky behaviors:**
 - **[Finding]** Certain risky behaviors are often socially triggered. Participants share them in favor of benefits (e.g., convenience)
 - Not only introduce non-recommended behaviors but also convey the risks in an impressive way (e.g., graphic and video)

Summary

- Non-negligible percentage (20-50%) of the participants experienced social triggers: they observed others engaging in risky behaviors or were advised to do so. (**RQ1**)
- Risky user behaviors are primarily triggered by friends, family, and online strangers. (**RQ2**)
- Certain behaviors (account sharing and illegal downloading) are often caused by social triggers. (**RQ3**)
- Risky behaviors caused by social triggers are more likely to be shared with others (i.e., negative social chains). (**RQ4**)