

Users Really Do Plug in USB Drives They Find

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Aug 30, 2016



“Do NOT plug any USB drive you find on campus into your workstation.”
-- Google Security Training



Experimental Setup

- Dropping 297 USB drives on UIUC campus
 - 30 locations
 - 5 types
 - 2 times a day
- Appearances



(a) Unlabeled drive



(b) Drive with keys



(c) Drive with return label



(d) Confidential drive



(e) Exam solutions drive

- .html files track when a file is opened

USB-STICK				
Name	Date Modified	Size	Kind	
Documents	Apr 26, 2015, 1:21 AM	--	Folder	
reflective_essay_02.docx.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
resume_old.pdf.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
resume.pdf.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
Math Notes	Apr 26, 2015, 1:21 AM	--	Folder	
2-13.docx.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
2-15.docx.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
2-20.docx.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
2-27.docx.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
3-5.docx.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
3-7.docx.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
Pictures	Apr 26, 2015, 1:21 AM	--	Folder	
Winter Break	Apr 26, 2015, 1:21 AM	--	Folder	
0101150001.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
0101150002.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
0101150117.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
0106151415.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1224142242.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1224142256.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1224142347.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1226141212.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1226141431.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1226141505.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1226141506.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1230141922.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1231142356.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1231142357.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	
1231142359.jpg.html	Apr 26, 2015, 1:21 AM	13 KB	HTML	

Results

Category	Drives Opened		<i>p</i>
Drive Type			
Confidential	29/58	(50%)	0.72
Exams	30/60	(50%)	0.71
Keys	32/60	(53%)	0.47
Return Label	17/59	(29%)	0.10
None	27/60	(45%)	–
Location Type			
Academic Room	25/58	(43%)	0.35
Common Room	26/60	(43%)	0.36
Hallway	24/59	(41%)	0.23
Outside	28/60	(47%)	0.58
Parking Lot	32/60	(53%)	–
Location Geography			
North	49/100	(49%)	0.26
South	46/97	(47%)	0.36
Main	40/100	(40%)	–
Time of Day			
Morning	71/149	(48%)	0.52
Afternoon	64/148	(43%)	–
Day of Week			
Tuesday	58/147	(39%)	0.05
Tuesday (no Return Label)	41/88	(47%)	0.57
Monday	77/150	(51%)	–

- 290/297 drives were picked up
- Files on 135/297(45%) drives were opened
- 58/135 took the survey
- Drives with return label showed less likely to be plugged in

Data Interpretation -- Fisher's Exact Test

P-value indicates how likely two datasets comes from the same distribution.

E.g. Are male and female equally likely to be on a diet?

$$p = \binom{10}{1} \binom{14}{11} / \binom{24}{12} = \frac{10! 14! 12! 12!}{1! 9! 11! 3! 24!} \approx 0.001346076$$

A diet example^[1]

	Men	Women	<i>Row total</i>
Dieting	1	9	<i>10</i>
Non-dieting	11	3	<i>14</i>
<i>Column total</i>	<i>12</i>	<i>12</i>	<i>24</i>

[1] Fisher's exact test, https://en.wikipedia.org/wiki/Fisher%27s_exact_test

- How vulnerable are the participants compared to general people?
 - UIUC students and staffs
- Baselines:
 - DOSPERT^[2]
 - Risk taking and risk perception of 359 participants
 - SeBIS^[3]
 - Security compliance of 3,619 participants
- Method
 - Reuse the same questions in the survey
 - Compare results

[2] Blais, Ann-Renée, and Elke U. Weber. "A domain-specific risk-taking (DOSPERT) scale for adult populations." *Judgment and Decision Making* 1.1 (2006).

[3] Egelman, Serge, and Eyal Peer. "Scaling the security wall: Developing a security behavior intentions scale (sebis)." *Proceedings of the 33rd Annual ACM Conference on Extended Abstracts on Empowering People*. ACM, 2015.

Example questions

- DOSPERT
 - Admitting that your tastes are different from those of a friend.
 - Betting a day's income at the horse races.
 - Drinking heavily at a social function.

Risk taking, English						
1	2	3	4	5	6	7
Extremely	Moderately	Somewhat	Not Sure	Somewhat	Moderately	Extremely
Unlikely	Unlikely	Unlikely		Likely	Likely	Likely

Risk perception, English						
1	2	3	4	5	6	7
Not at all	Slightly	Somewhat	Moderately	Risky	Very	Extremely
Risky	Risky	Risky	Risky		Risky	Risky

Example questions

- SeBIS
 - I frequently backup my computer.
 - I am careful to never share confidential documents stored on my home or work computers.
 - I never give out passwords over the phone.

I would prefer to live in a large city rather than a small city. [Strongly disagree (1), (2), (3), (4), (5), (6), Strongly agree (7)]

Data Interpretation -- Take Aways

- Participants are more risk averse than general population. (v.s. DOSPERT)
- The security behavior of participants is not significantly different from peer students. (v.s. SeBIS)

Discussion

- What are the key contributions?
- What is the limitation of this paper?
- Do you agree with the claims made in this paper? E.g.
 - Participants picking up the drives are altruistic and curious.
 - College students are more risk averse than general population.
 - Social engineering attack will work on general people.
- What would you do if you spot a USB drive somewhere?

“If you do find a USB drive, turn it to security desk.”

-- Google Security Training

Thanks.