



CHI2025

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I Was Told to Install the Antivirus App, but I'm Not Sure I Need It: **Understanding Smartphone Antivirus Software Adoption and User Perceptions**

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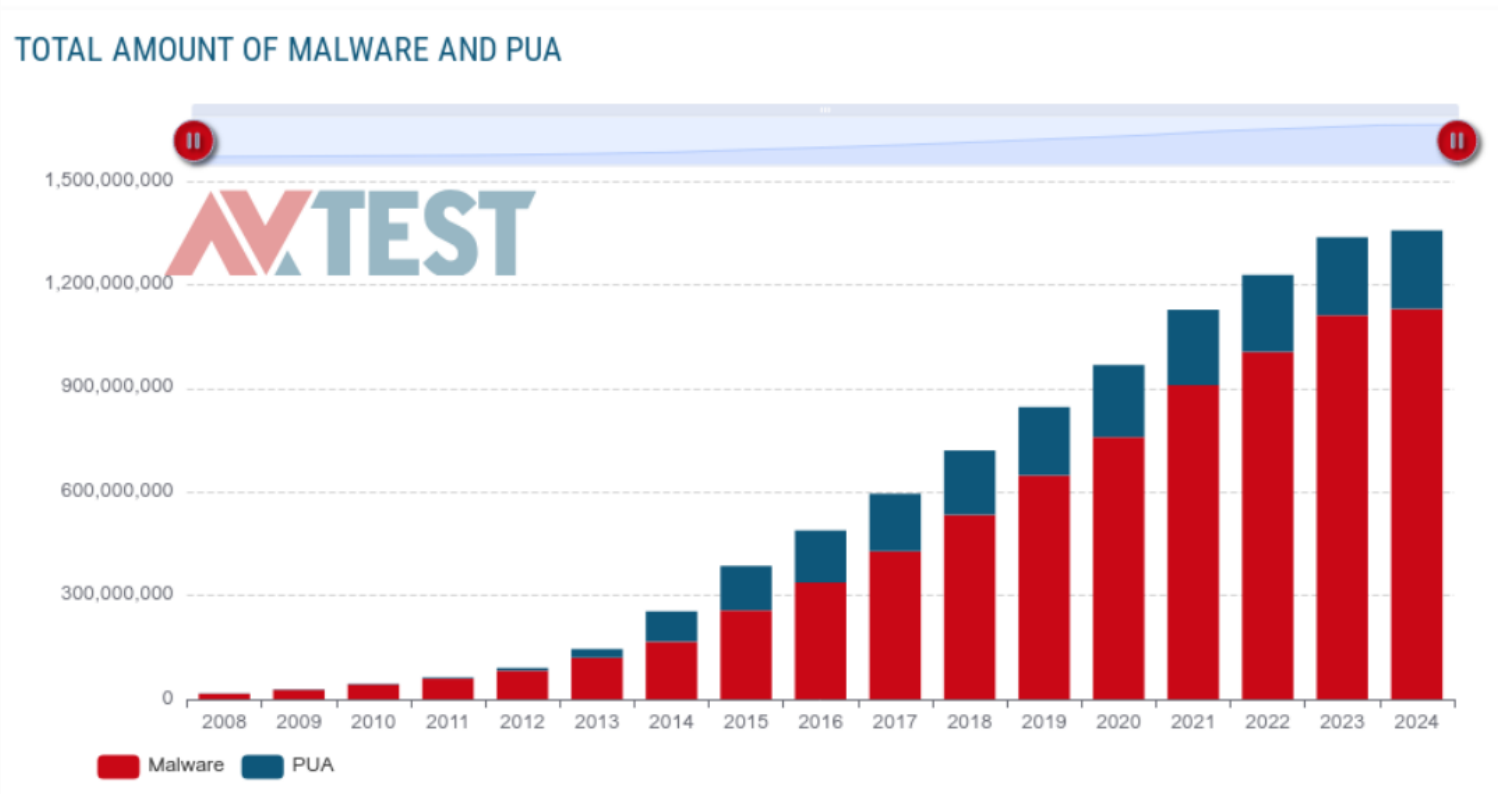
Security Lab



Interactive Computing
Laboratory

Mobile malware continues to increase alongside the growth of smartphones

Total malware



Attacks using mobile malware reached over **10M cases** from Q4 2023^[1].

[1] Kaspersky. 2024. "IT Threat Evolution in Q1 2024. Mobile Statistics." in <https://securelist.com/it-threat-evolution-q1-2024-mobile-statistics/112750/>

[2] AV-TEST, "TOTAL AMOUNT OF MALWARE AND PUA." in <https://www.av-test.org/en/statistics/malware/>

Security vendors recommend using antivirus software as one effective safeguard

Updated on 18/03/2025

10 Best Antivirus Software

Our Team of Experts have Reviewed Over 150 Top Antivirus Software for PC, Mac, iOS & Android. Easily Compare Security Features, OS, Deals and More. Get the Highest Level of Digital Protection!

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Surfshark

Most Popular

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TOTALAV

2025 Editor's Choice

9.8 ★★★★★

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Guardio

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Antivirus software can **prevent, detect, and remove** malware effectively.

Mobile antivirus software usage rates remain low

Despite advice from security vendors and experts, **31%** of smartphone users in South Korea utilize such security measures^[4].

These low usage rates are particularly **concerning given the growing malware threat landscape.**

**What are the fundamental reasons
for this low adoption rate?**

Research objectives

Identifying key reasons for the low adoption of smartphone antivirus software by examining real-world user **perceptions** and **experiences**.

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RQ1

What are smartphone users' **perceptions** and **usage patterns** regarding antivirus software?

RQ2

What are the **reasons** for smartphone users' **adoption, discontinuation, or non-use** of antivirus software?

RQ3

How do users' usage patterns and reasons **differ between smartphones and PCs?**

Overview of studies

**Interview Study
(N=23)**

**Survey Study
(N=250)**

Overview of studies

Interview Study (N=23)

Investigating users' **perceptions** and **usage patterns** (RQ1), and the **reasons for adoption, discontinuation, or non-use** of antivirus software (RQ2).

Survey Study (N=250)

Overview of studies

Interview Study
(N=23)

Investigating users' **perceptions** and **usage patterns** (RQ1), and the **reasons for adoption, discontinuation, or non-use** of antivirus software (RQ2).



Survey Study
(N=250)

Investigating **key adoption factors** (RQ2) and **platform-based differences** in usage patterns and their reasons (RQ3).

Interview Study Findings

RQ1

What are smartphone users' **perceptions** and **usage patterns** regarding antivirus software?

RQ2

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RQ3

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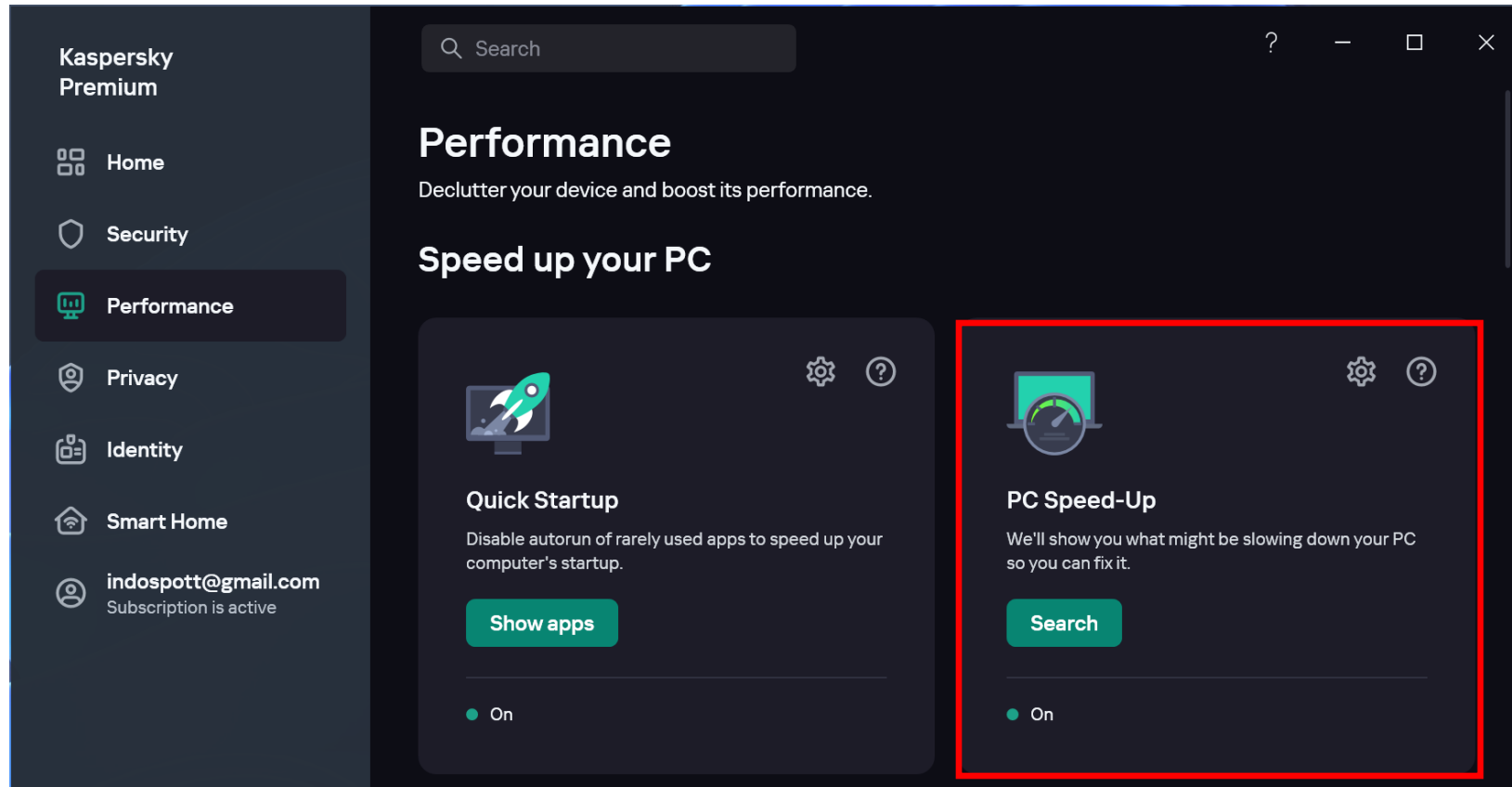
Users' perception and usage patterns

Q: Please explain the primary purpose of antivirus software.



*“Well, it seems like it catches things like malicious codes, **optimizes the battery**, and also **gets rid of duplicate files and the trash**, making it a bit **more optimized for using the phone**.” (P1)*

Users' perception and usage patterns



Device optimization function
is in antivirus software.

Users' perception and usage patterns

43% of users (10 out of 23) **misunderstood** the **purpose** and **functionality** of antivirus software, often confusing it with **general security features** or **performance optimization tools**.

Users' perception and usage patterns

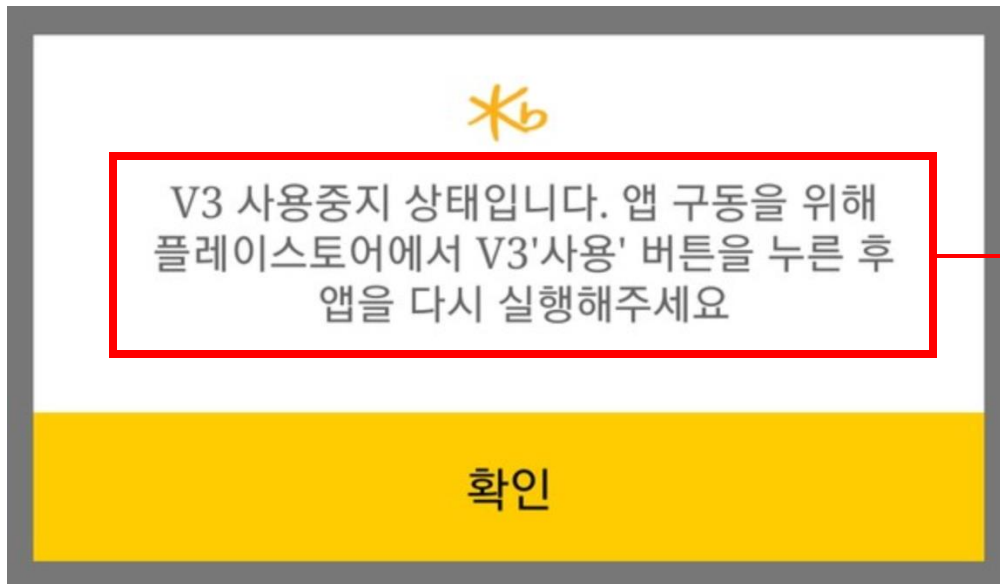
Q: What features of the antivirus software do you primarily use?



“I was told to install the (antivirus) app if I wanted to use banking apps, so I just installed it, but if I’m not sure I need it. Even if I don’t want to, I have no choice but to install it” (P6)

Users' perception and usage patterns

Many Korean financial institutions **mandate the installation of bundled antivirus apps** (e.g., V3 Mobile Plus^[6] and V-Guard for Web^[7]).



“V3 is disabled. To run the app, press the 'Enable V3' button in the Play Store and run the app again.”

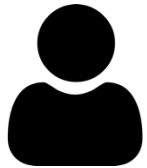
('OK' button)

[6] AhnLab Inc. 2024. V3 Mobile Plus. <https://play.google.com/store/search?q=V3%20Mobile%20Plus&c=apps&hl=en>.

[7] Infraware Ltd. 2024. V-Guard for Web. <https://play.google.com/store/apps/details?id=kr.co.shiftworks.vguardweb&hl=en>.

Users' perception and usage patterns

Antivirus software is installed under financial institutions' security requirement, but **users do not know how to use it or what it protects against.**



“I think the antivirus app runs automatically in the background, but I’m not really sure. ... I just use the main app without thinking much about the antivirus thing.” (P8)

Users' perception and usage patterns

Financial institutions' security requirements **increased adoption, but failed to raise user awareness**, ultimately leading to negative perceptions or a false sense of security.

Users' perception and usage patterns

Financial institutions' security requirements **increased adoption, but failed to raise user awareness**, ultimately leading to negative perceptions or a false sense of security.



Financial institutions can increase user awareness by providing **practical guidance** on the security requirements and antivirus tools they mandate.

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Reasons for use, discontinuation, or non-use

Q: What reasons led you to start using it or decide not to use it?



User

*“It's popular in **online communities**.” (P1)*



Non-User

*“If someone suggested I try to use it, I might have tried it, but **no one around me** uses it.” (P15)*

Reasons for use, discontinuation, or non-use

Social influence significantly impacts **users' decisions** about security software, affecting both adoption and non-use.

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Antivirus
providers

Leverage social influence to promote the adoption of smartphone antivirus apps by displaying **peer usage statistics** and **highlighting expert advices**.

(e.g., "40% of your friends use antivirus apps")

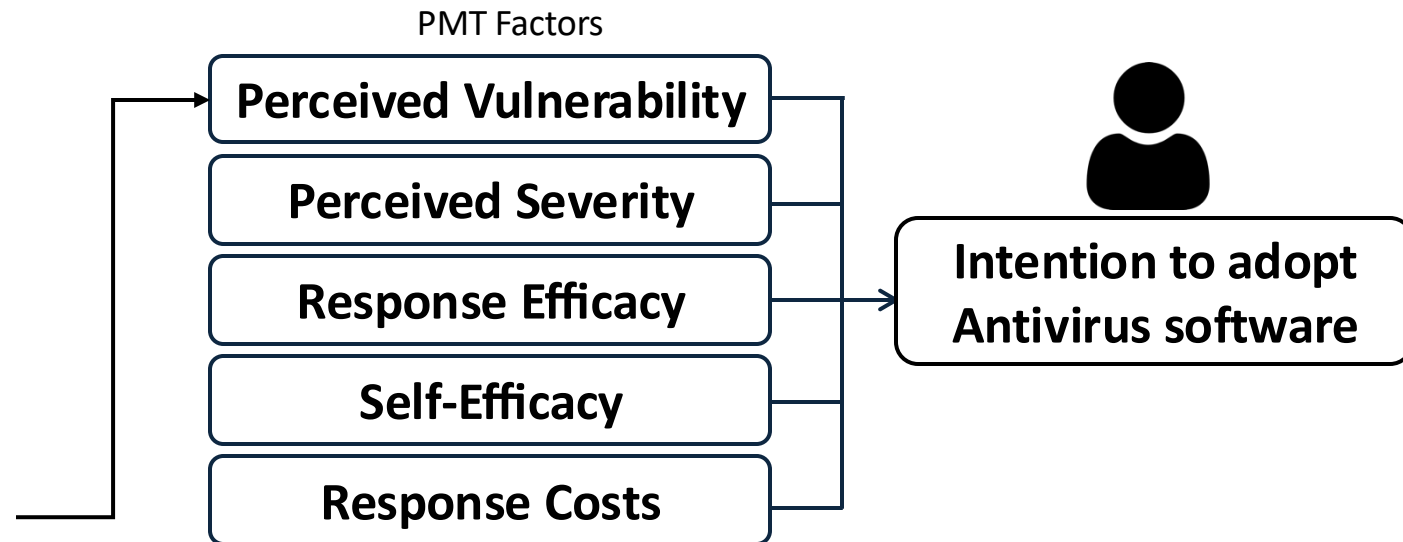
(e.g., "70% of cybersecurity experts recommend using standalone antivirus")

Survey Study Findings

What are the most influential factors in antivirus use?

Used the theoretical framework of ***Protection Motivation Theory (PMT)***^[8] that explains how users engage in protective behaviors.

*Q. How **likely or unlikely** do you think you are to **experience a malware infection** on your smartphone?*



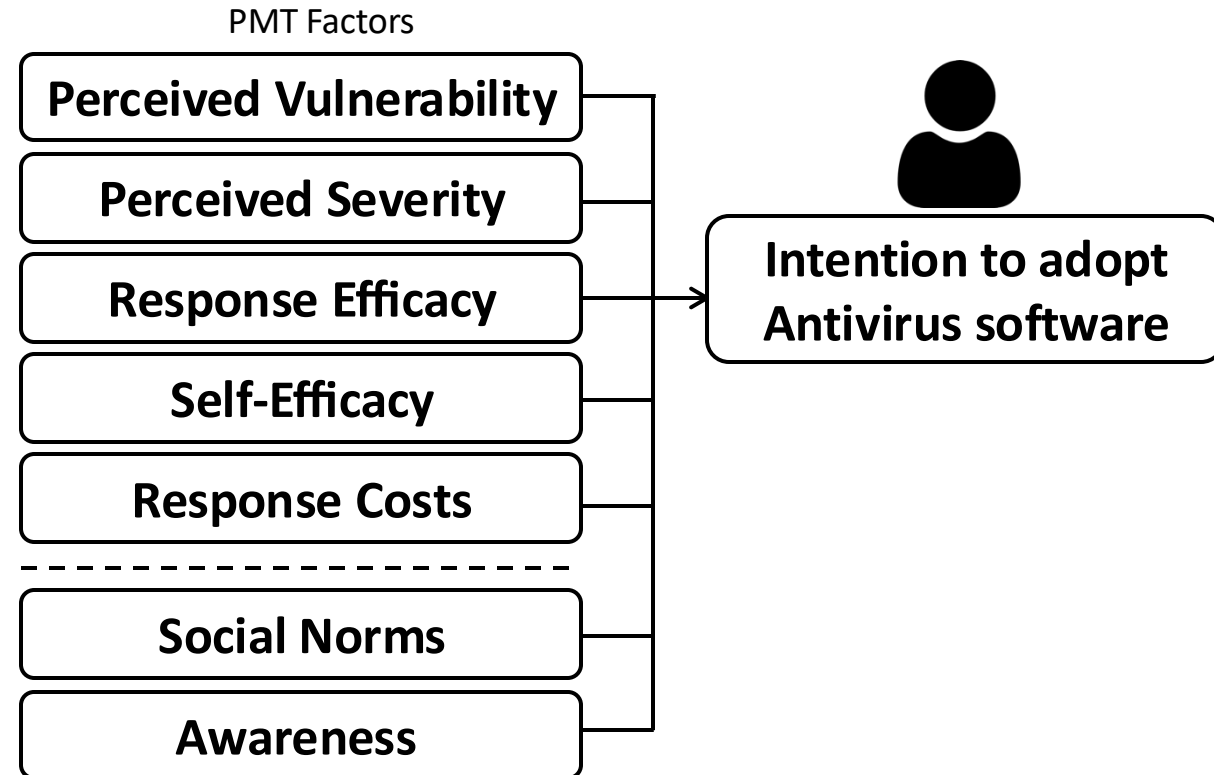
What are the most influential factors in antivirus use?

Incorporated two factors:

Social norms^[9,10] and **Awareness**^[11]

Insights from the interview study

Social Influences	(e.g., others' recommendations, or non-use within their social circle)>
Limited Knowledge	(e.g., regarding the purpose and functionality)>



[9] Waleed Al-Ghaith. "Extending Protection Motivation Pheory to Understand Security Determinants of Anti-Virus Software Usage on Mobile Devices." in International Journal of Computers (2016).

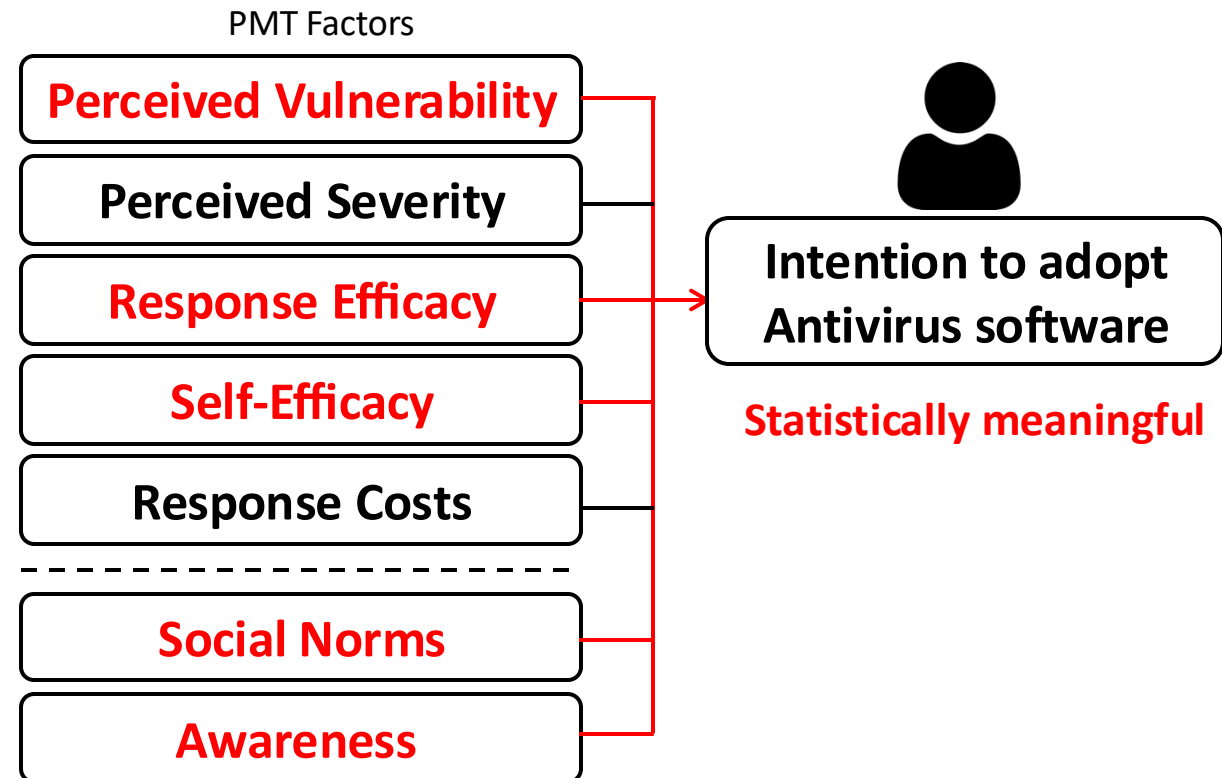
[10] Nik Thompson et.al., "Security Begins at Home": Determinants of Home Computer and Mobile Device Security Behavior." in Computers & Security (2017).

[11] Tamara Dinev and Qing Hu. "The Centrality of Awareness in the Formation of User Behavioral Intention Toward Protective hformation Technologies." in Journal of the Association for Information Systems (2007).

Key factors in influencing the intention to adopt smartphone antivirus software

We identified **key adoption factors unique** to smartphones.

- ✓ These findings aligned with those from our interview study: **Social norms (social influence)** is a **key factor**.
- ✓ These factors should **be considered** when developing **effective adoption strategies for smartphone** antivirus software.



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Differences Between PC and Smartphone Antivirus Adoption

Prior Research on PC Antivirus Adoption

- Common adoption factors for PCs include *perceived severity, response cost, response efficacy, and self-efficacy*^[12,13].

Smartphone Context: Unique Characteristics

- Greater performance and resource constraints
- App-based installation and management
- Higher reliance on default security settings

✓ Therefore, a PC-centric model may not fully explain how users adopt antivirus software on smartphones

[12] Gurung et. al, "Consumer Motivations in Taking Action Against Spyware: An Empirical Investigation," Information Management & Computer Security (2009).

[13] Woon et.al, "A Protection Motivation Theory Approach to Home Wireless Security," ICIS 2005.

Cross-platform usage patterns and reasons

Q: What reasons led you to decide to discontinue or not use antivirus software?

Main reasons for **discontinuation**

 Smartphones: **System overhead (35%)**

 PCs: **Financial costs (19%)**

Main reasons for **non-use**

 Smartphones: **Lack of knowledge to install /use an antivirus app (24%)**

 PCs: **Low PC proficiency /Infrequent use (24%)**

Cross-platform usage patterns and reasons

On smartphones, **system overhead** and **a lack of knowledge** about installation and usage are major barriers to using antivirus software.



Security
developers

Work to **minimize the system overhead** of smartphone antivirus software — for example, by scanning only downloaded APK files or running full scans during late-night charging when the device is idle.

Conclusion

- ✓ **Low User Awareness and Understanding**
 - Many users **misunderstand the purpose and functionality**.
 - **Adoption is often driven** by financial institutions' requirements, **but users either vulnerable or falsely reassured**.
- ✓ **Key Adoption and Usage Factors**
 - **Social influence** significantly impacts **users' decisions** about security software.
 - Key smartphone antivirus adoption factors are **perceived vulnerability, response efficacy, self-efficacy, social norms, and awareness**.
- ✓ **Different Usage Patterns Between Smartphone and PCs**
 - Unlike the **cost of purchasing** antivirus software on PCs, the **overhead of system performance** is a greater barrier on smartphones.



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Thank you for listening.

If you have any questions, please feel free to contact me at 22sysy@skku.edu.

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