

# HOW TO ASK FOR PERMISSION

Adrienne Porter Felt, Serge Egelman, Matthew Finifter,  
Devdatta Akhawe, David Wagner  
University of California, Berkeley



# USER-BASED PERMISSIONS

# ADVERSARIAL APPS

## **MALWARE:**

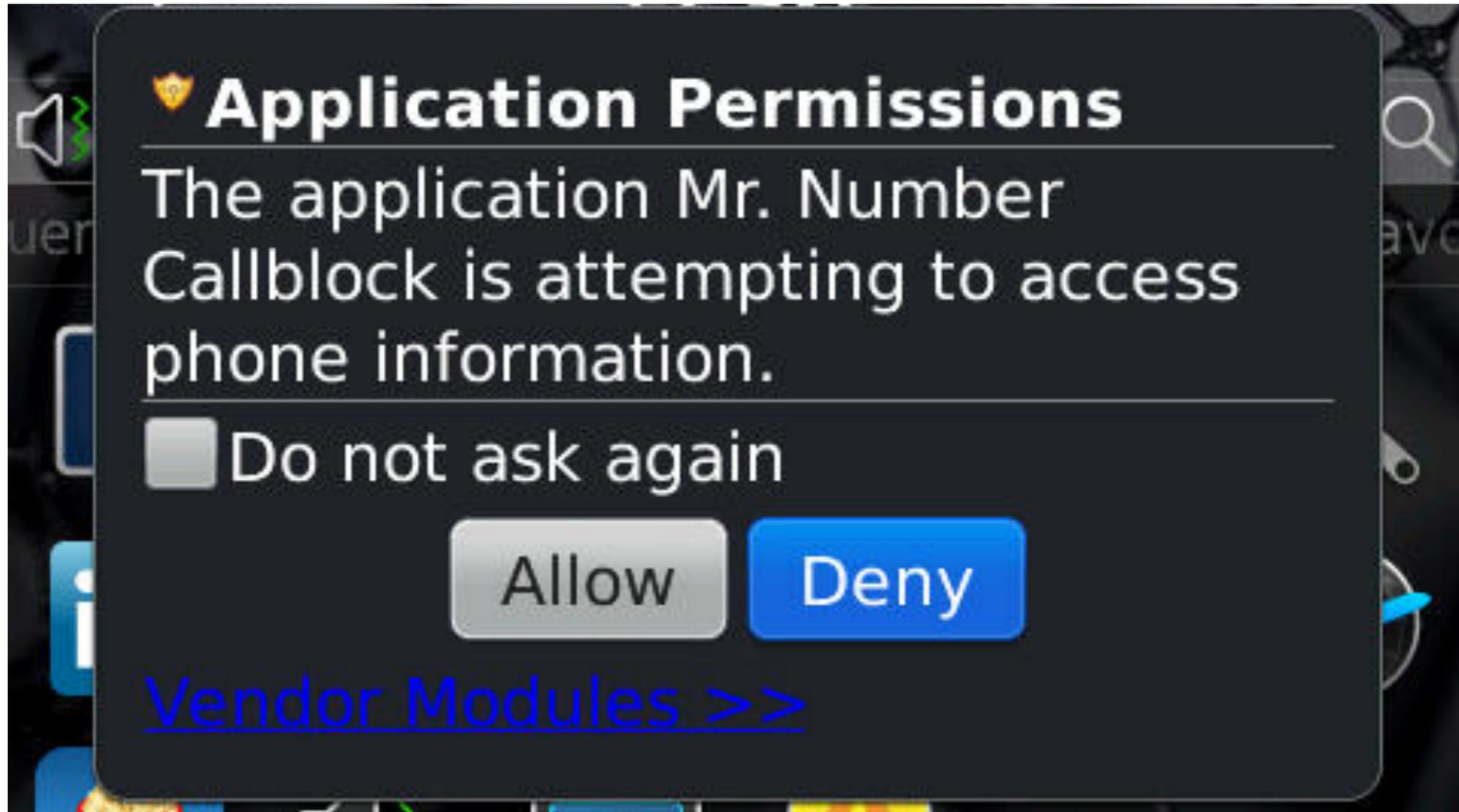
Actively harms the user

## **GRAYWARE:**

Pushes the boundaries of legality

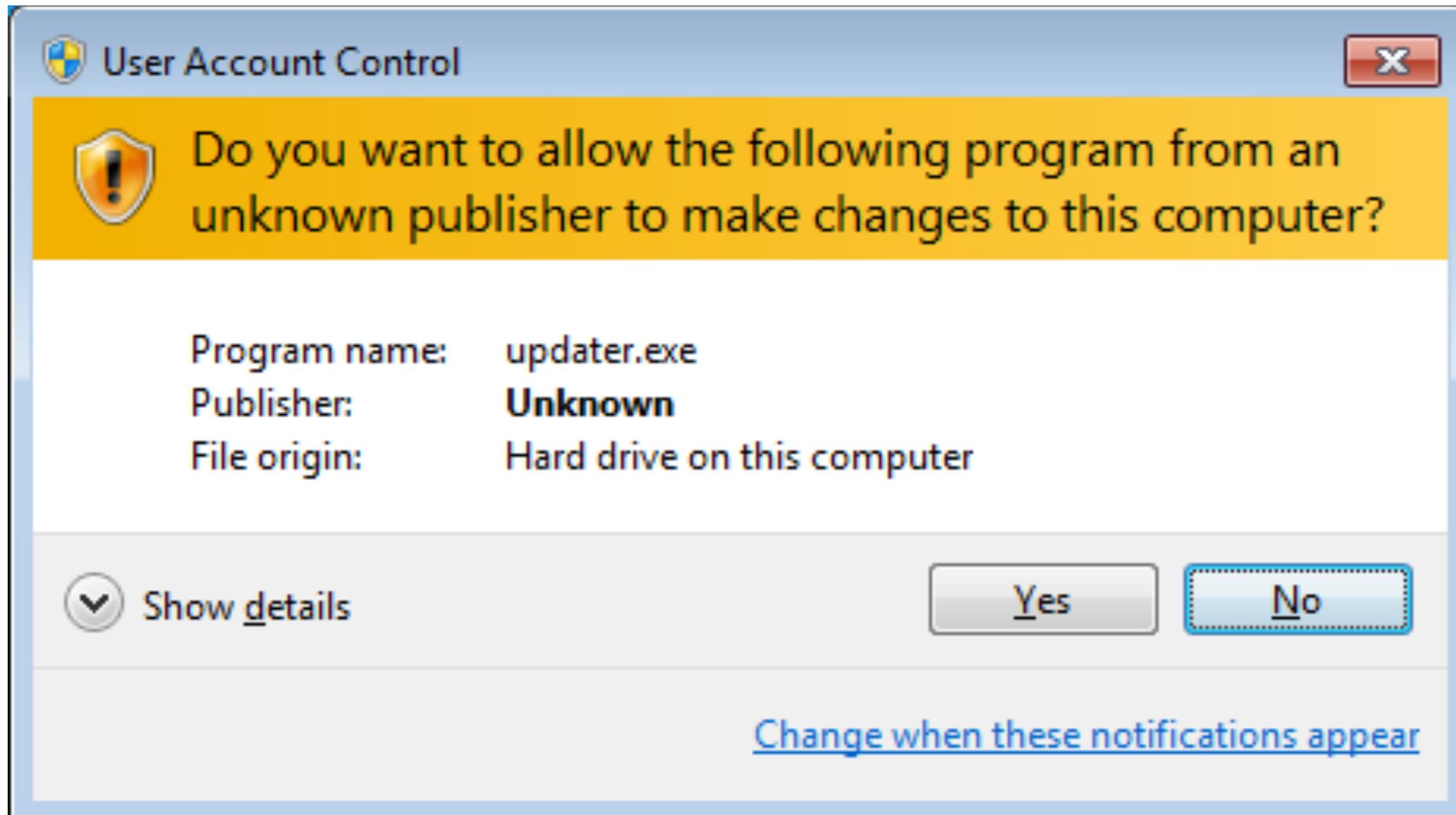
## **LEGITIMATE:**

Benign, but it has unwanted features

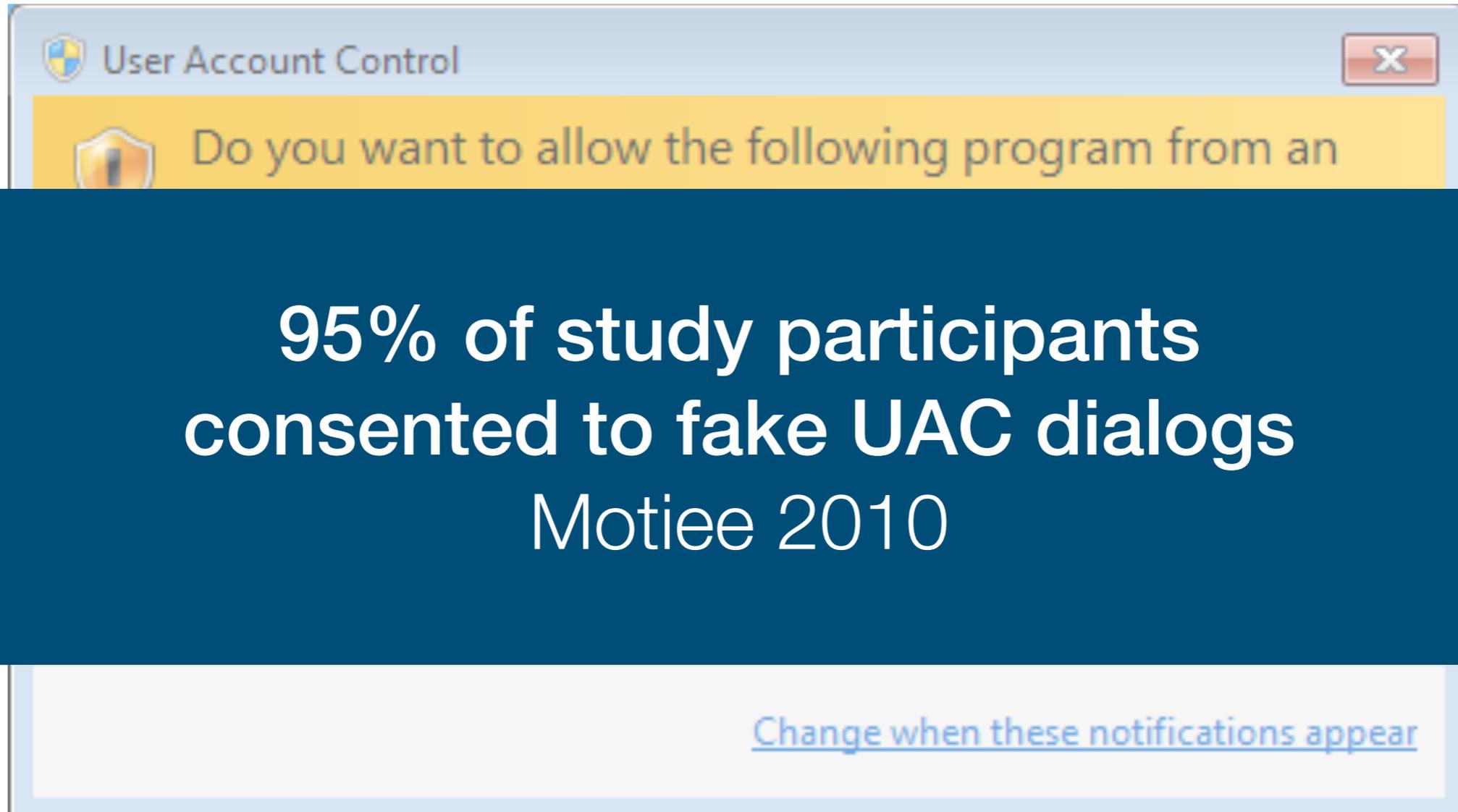


# APP-BASED PERMISSIONS

**Permissions** are  
supposed to help users  
control their applications

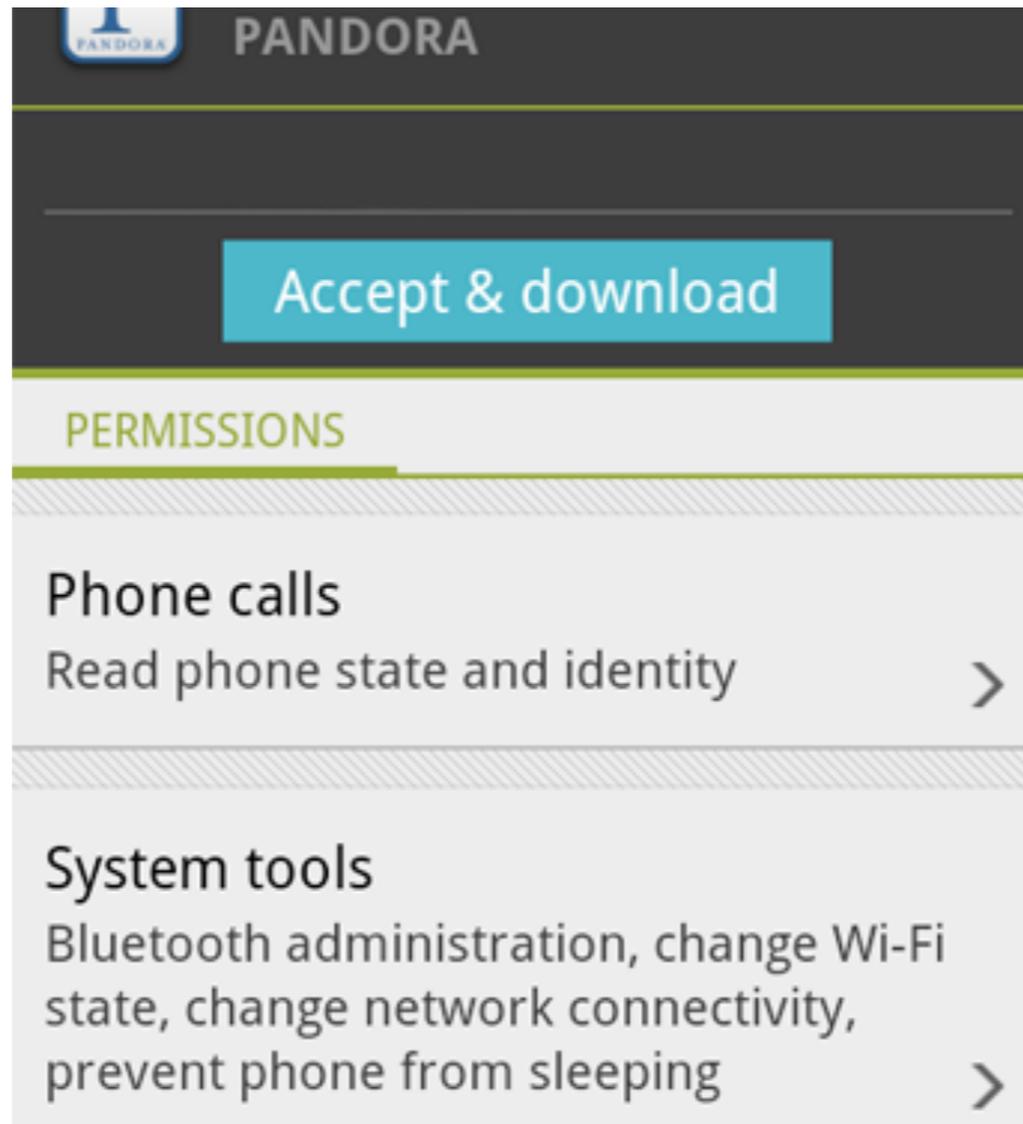


**WINDOWS**

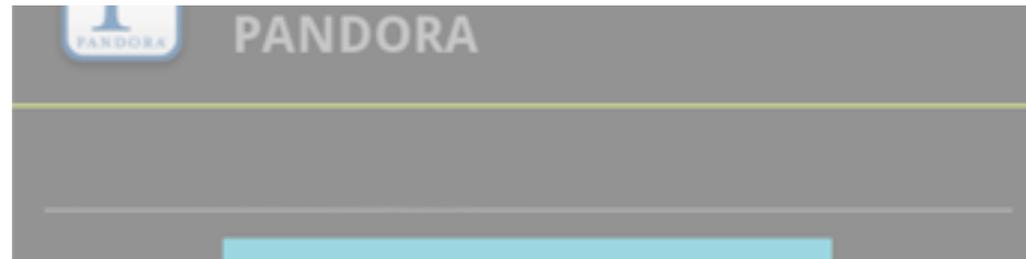


**95% of study participants  
consented to fake UAC dialogs  
Motiee 2010**

**WINDOWS**



# ANDROID



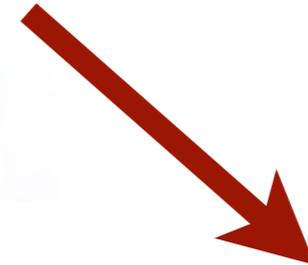
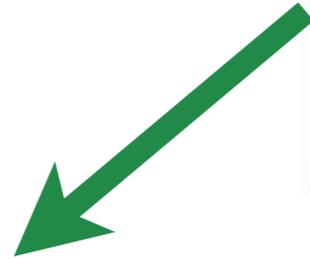
**42% of study participants  
had never noticed the permissions  
Felt 2012**

Bluetooth administration, change Wi-Fi  
state, change network connectivity,  
prevent phone from sleeping >

**ANDROID**

How do we ask users to  
make **informed decisions**  
about app permissions?

# GUIDING PRINCIPLES



## **optimizing**

reads the question  
retrieves memories  
makes a decision

## **satisficing**

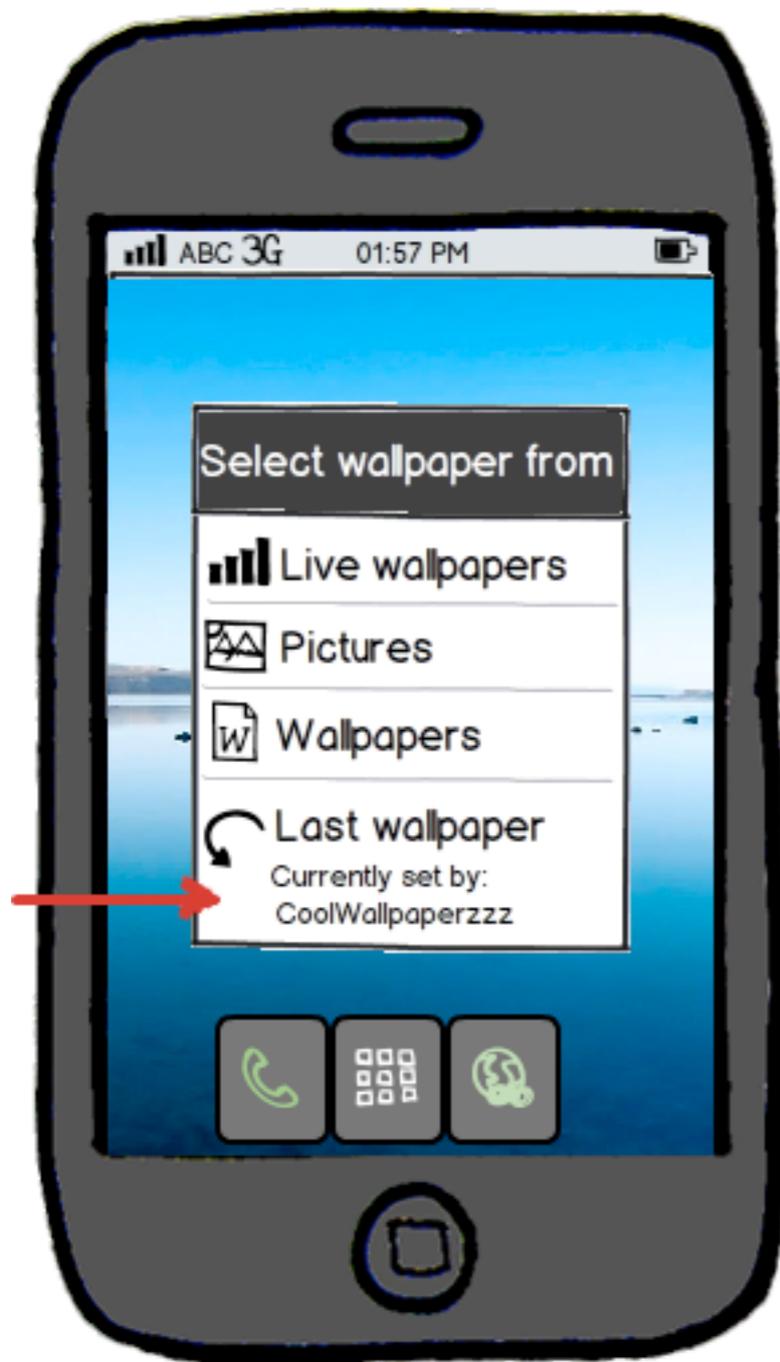
does not understand  
retrieves cues  
relies on heuristics

# DUAL PATH MODEL

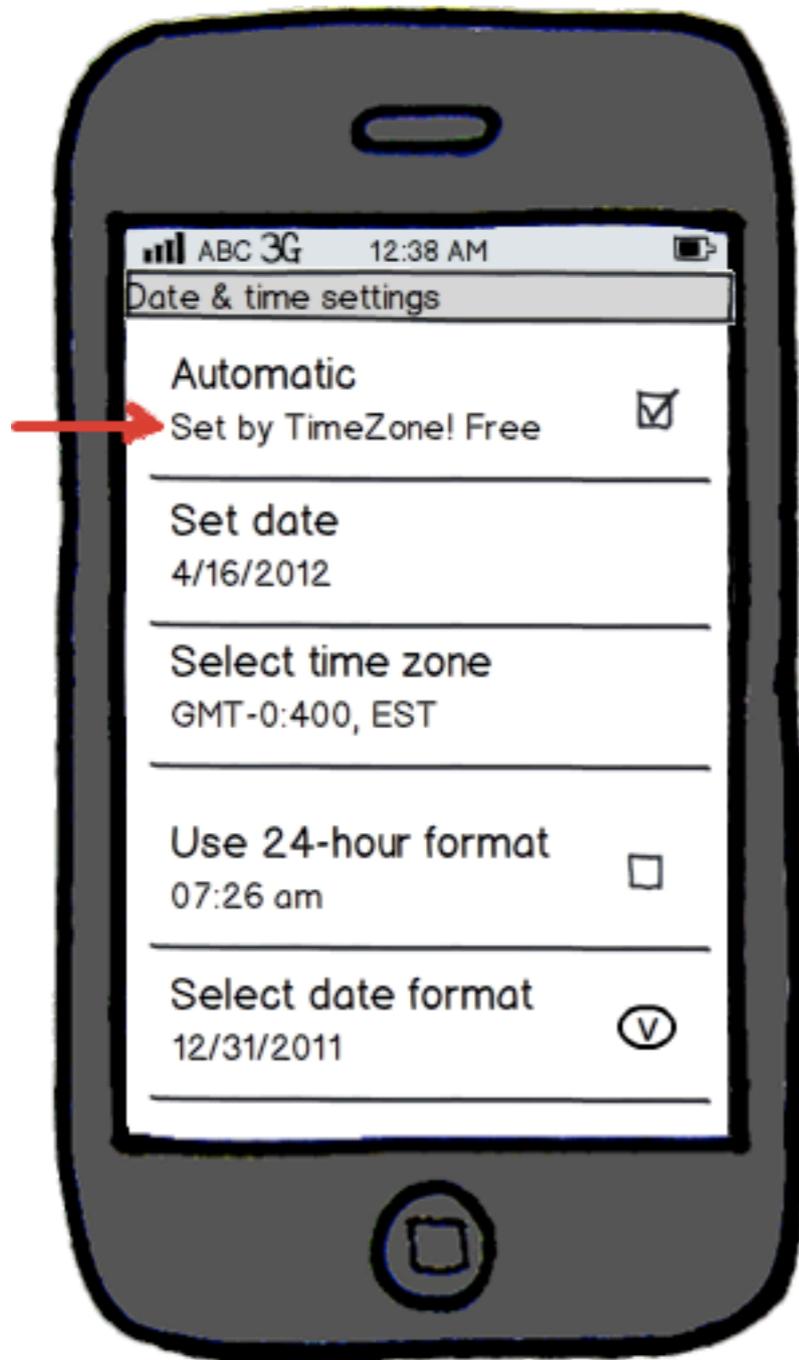
**Conserve user attention**

**Don't interrupt the user's  
primary task for security**

# PERMISSION-GRANTING MECHANISMS



**AUTOMATIC GRANT**



## PRO

Does not consume user attention

## CON

Only appropriate for revertible or low-severity permissions

# AUTOMATIC GRANT



TRUSTED UI



**PRO**

Non-interruptive

**CON**

Only appropriate for  
user-initiated actions

**TRUSTED UI**



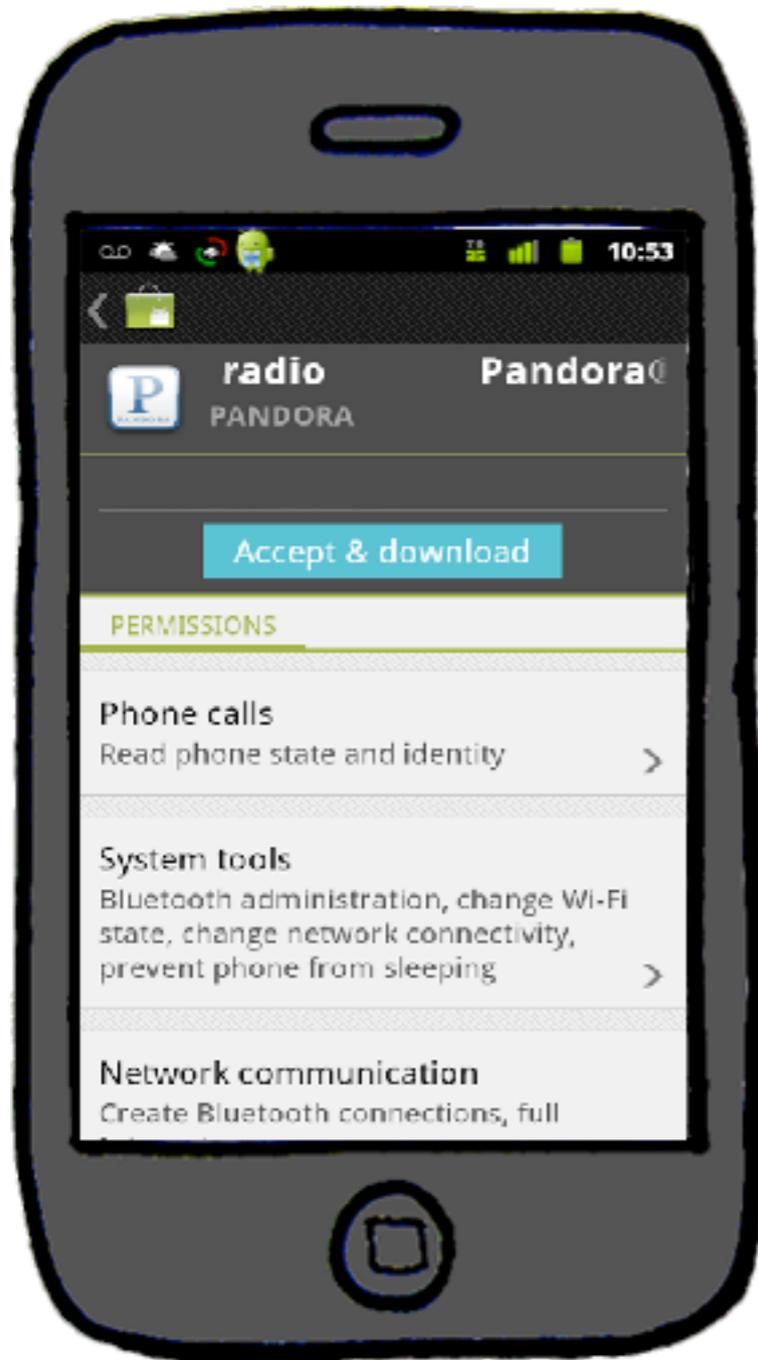
## PRO

Applicable to almost all permissions

## CON

Interruptive, habit-forming, not useful for advance approval

# RUNTIME CONSENT DIALOGS



## PRO

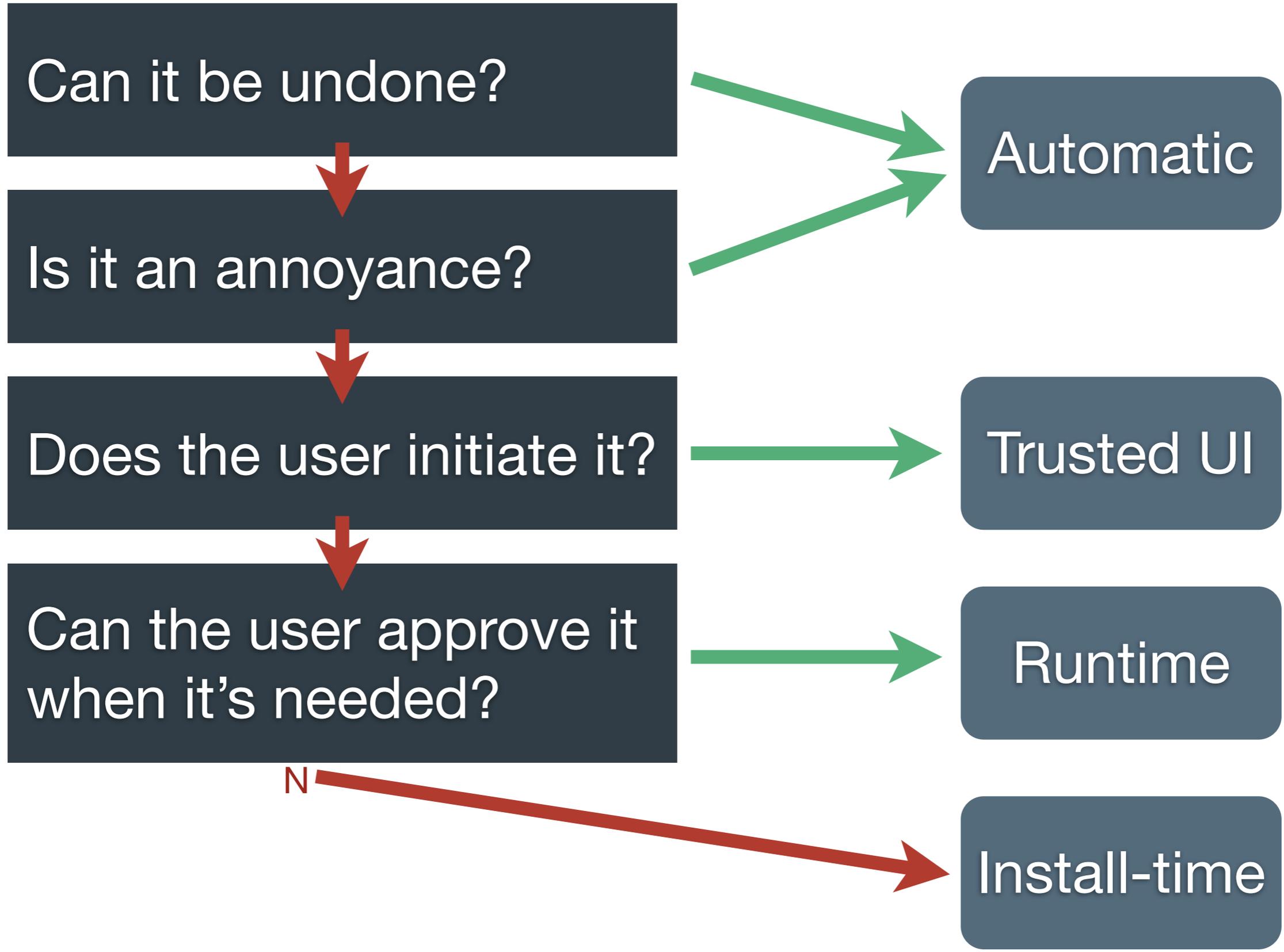
Applicable to all permissions, even advance approval

## CON

Interruptive, looks like EULAs, habit-forming

# INSTALL-TIME WARNINGS

Instead of choosing one  
mechanism for a system,  
**choose the best for each  
permission**



Can it be undone?



Is it an annoyance?



Does the user initiate it?



Trusted UI

Can the user approve it  
when it's needed?

**RECORDING WITH THE MIC**

Automatically granted	60%
Trusted UI	21%
Runtime consent dialogs	11%
Install-time warnings	7%

76 platform-neutral permissions

# PERMISSION ASSIGNMENT

**Which is better, run-time  
or install-time?**

Which is better, run-time  
or install-time?

**Wrong question!**

**We propose guidelines  
for how to ask users for  
permission with minimal  
interruptions**

**QUESTIONS?**

**adriennefelt@gmail.com**

[www.adrienneporterfelt.com](http://www.adrienneporterfelt.com)