

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:

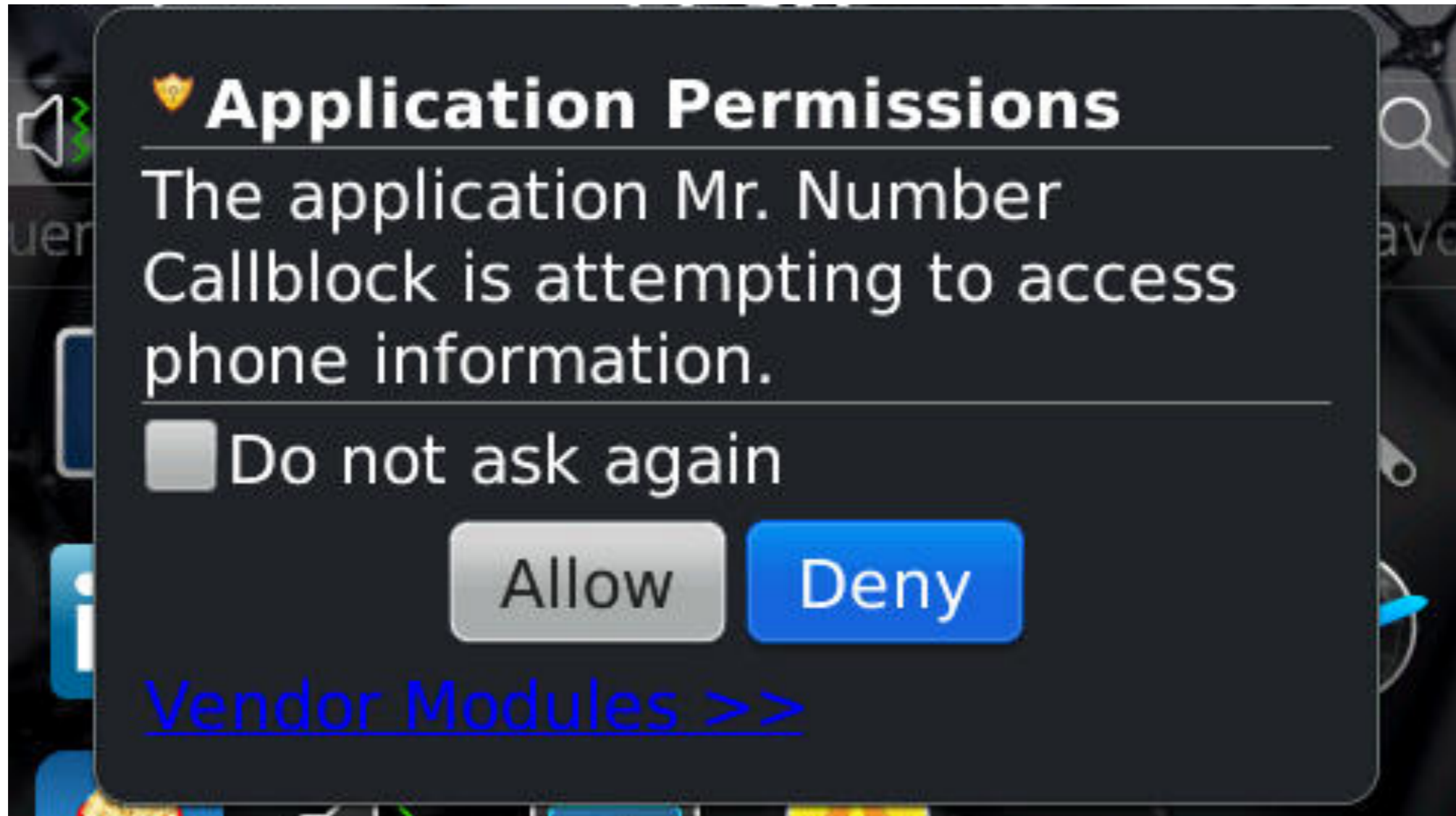
Actively harms the user

GRAYWARE:

Pushes the boundaries of legality

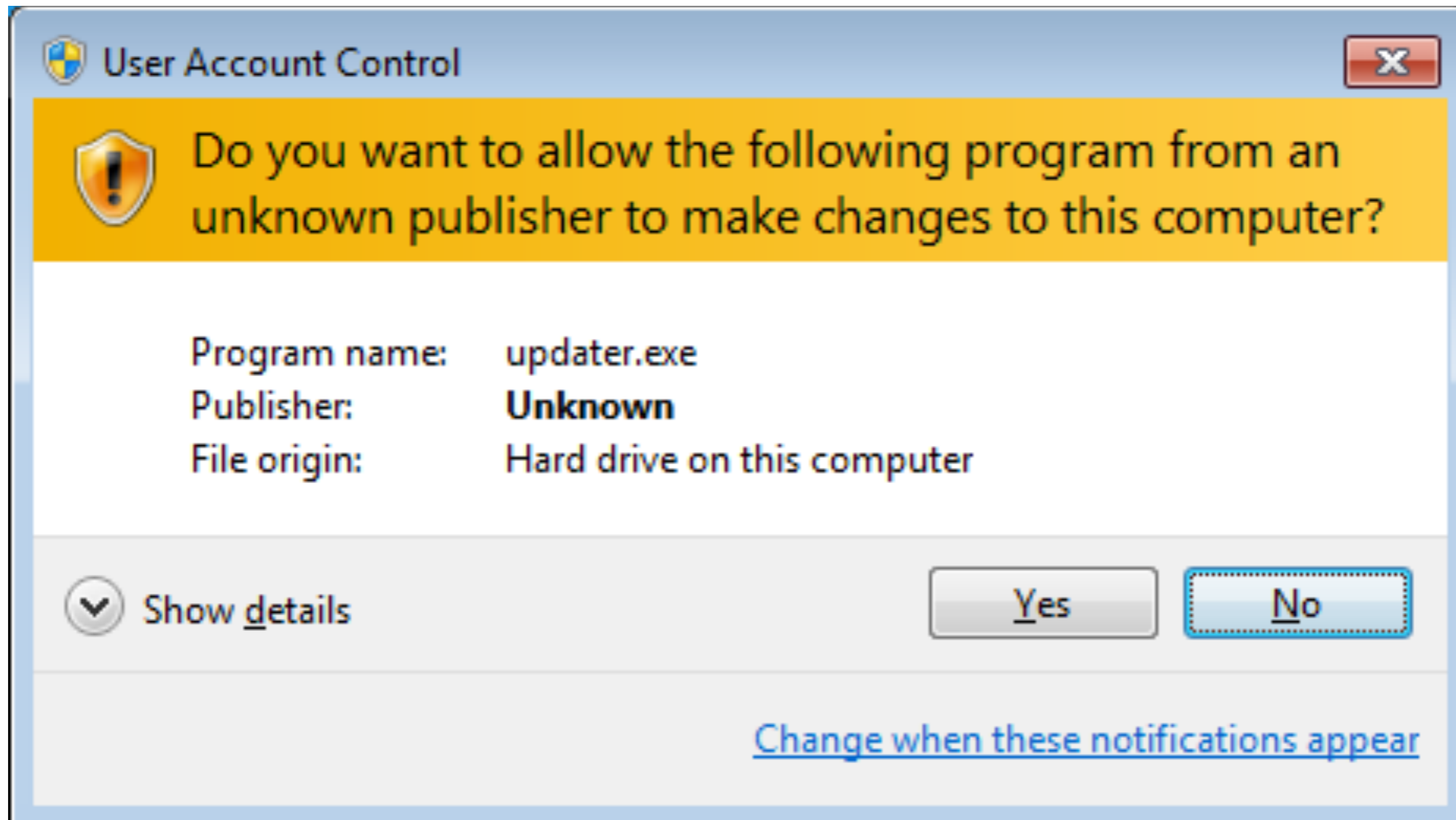
LEGITIMATE:

Benign, but it has unwanted features

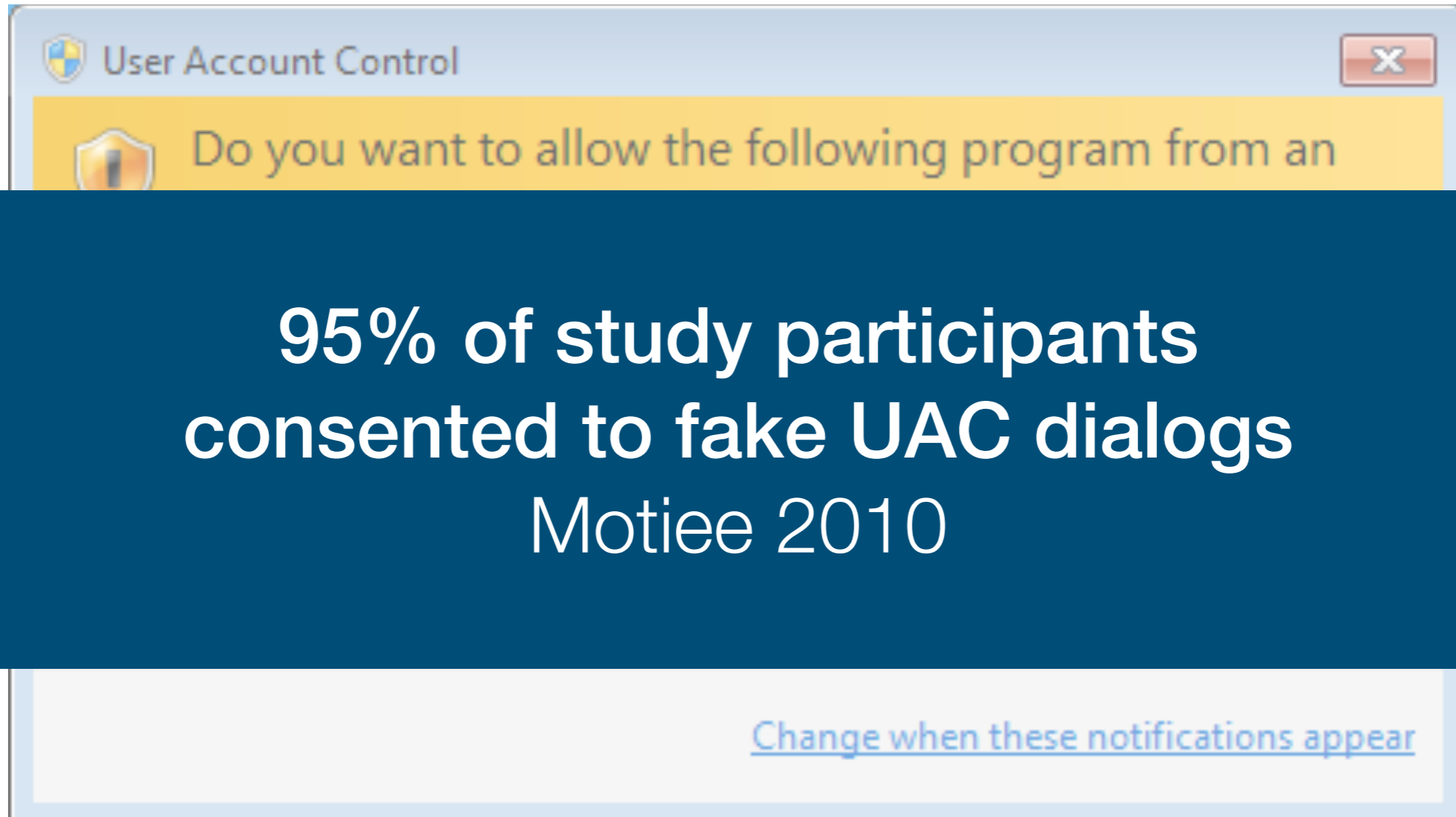


APP-BASED PERMISSIONS

Permissions are
supposed to help users
control their applications

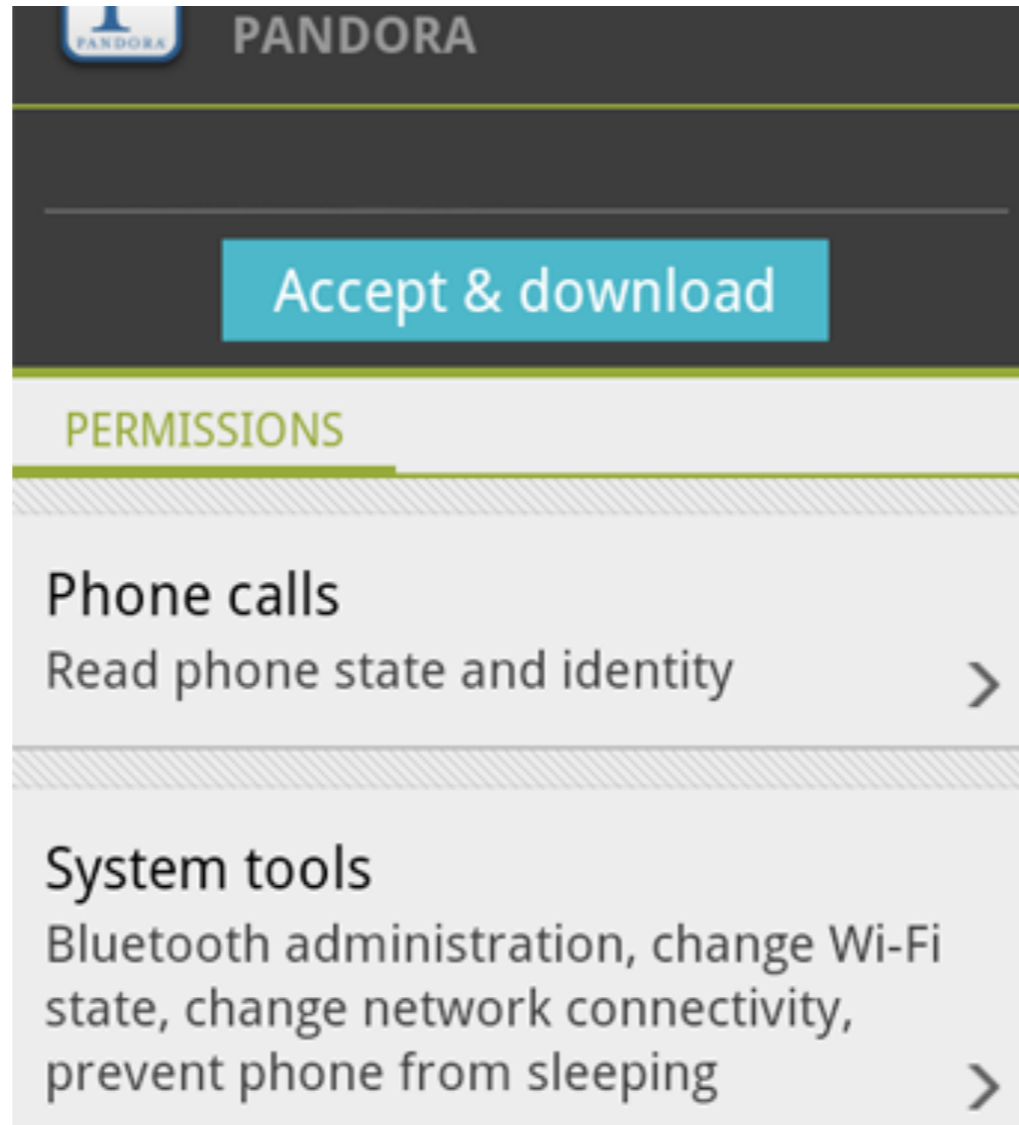


WINDOWS

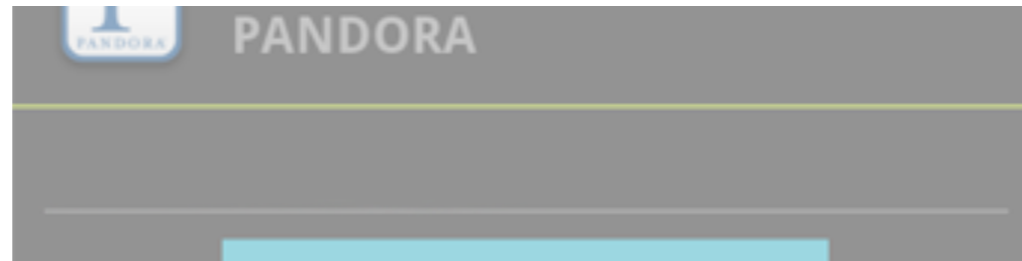


**95% of study participants
consented to fake UAC dialogs**
Motiee 2010

WINDOWS



ANDROID



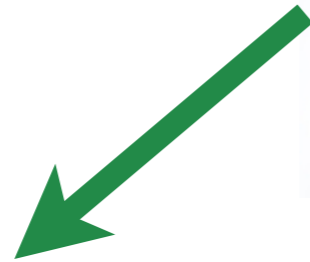
**42% of study participants
had never noticed the permissions
Felt 2012**

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

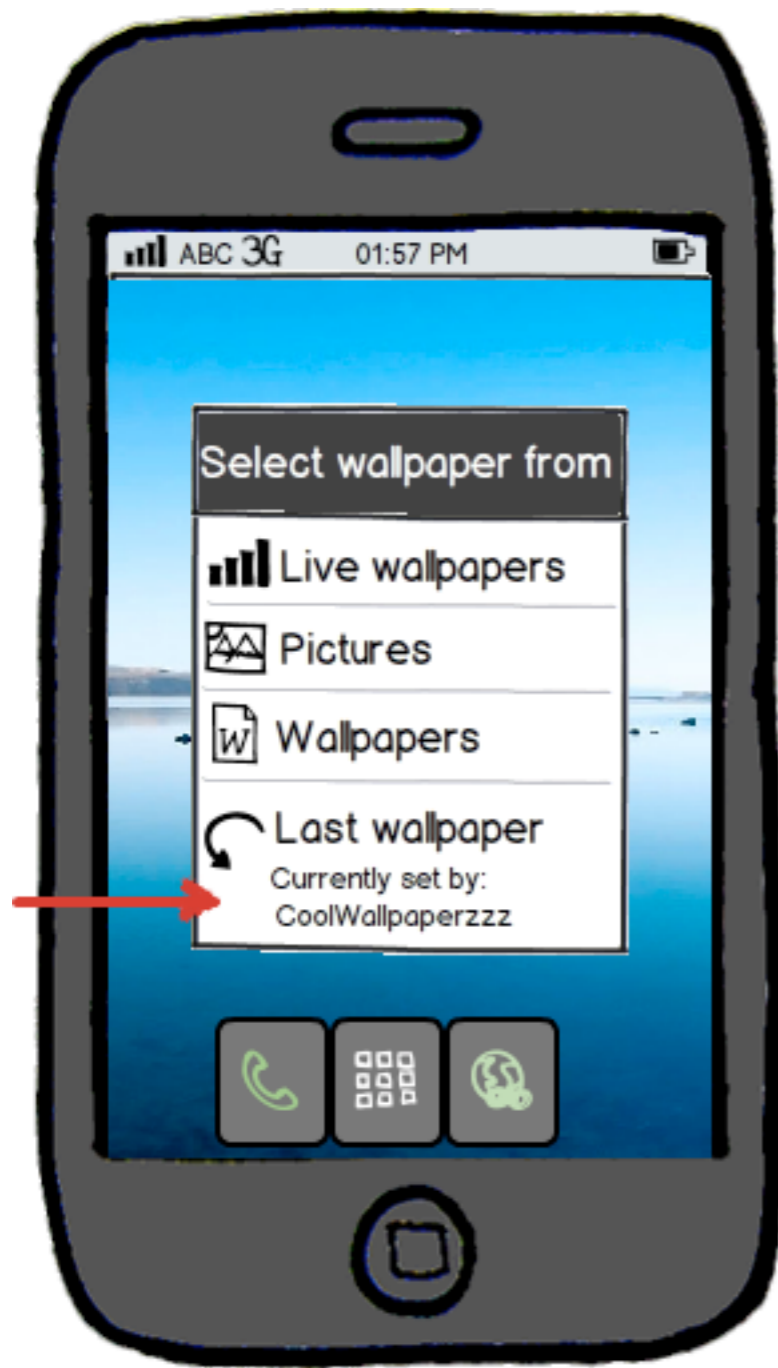
does not understand
retrieves cues
relies on heuristics

DUAL PATH MODEL

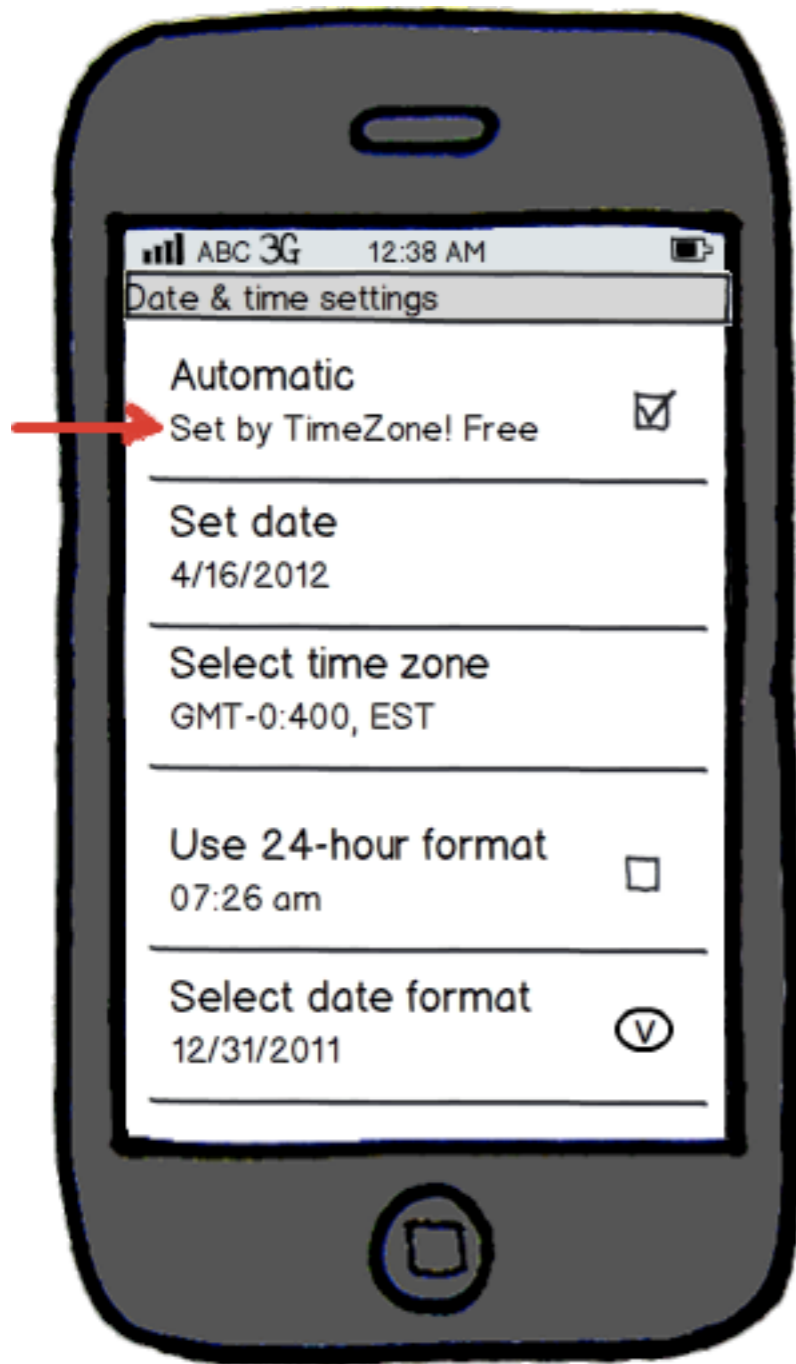
Conserve user attention

**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



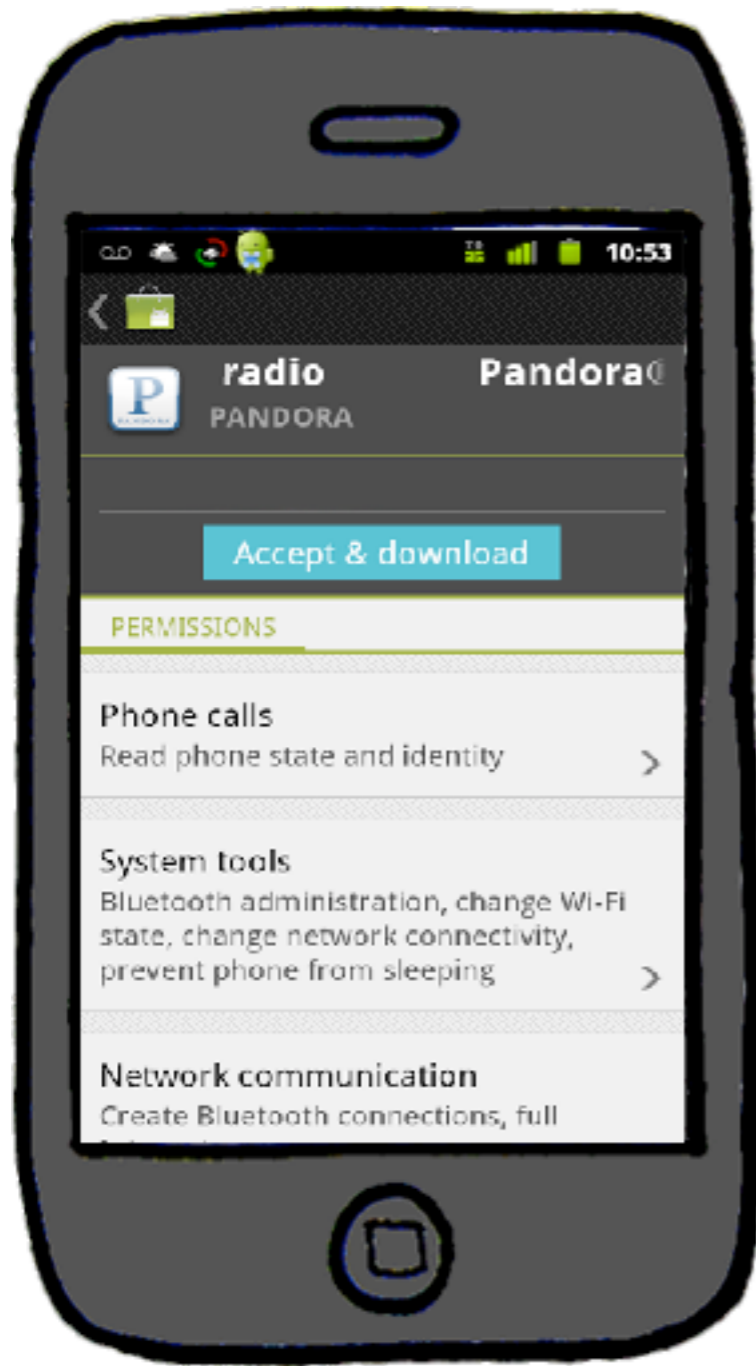
PRO

Applicable to almost all permissions

CON

Interruptive, habit-forming, not useful for advance approval

RUNTIME CONSENT DIALOGS



PRO

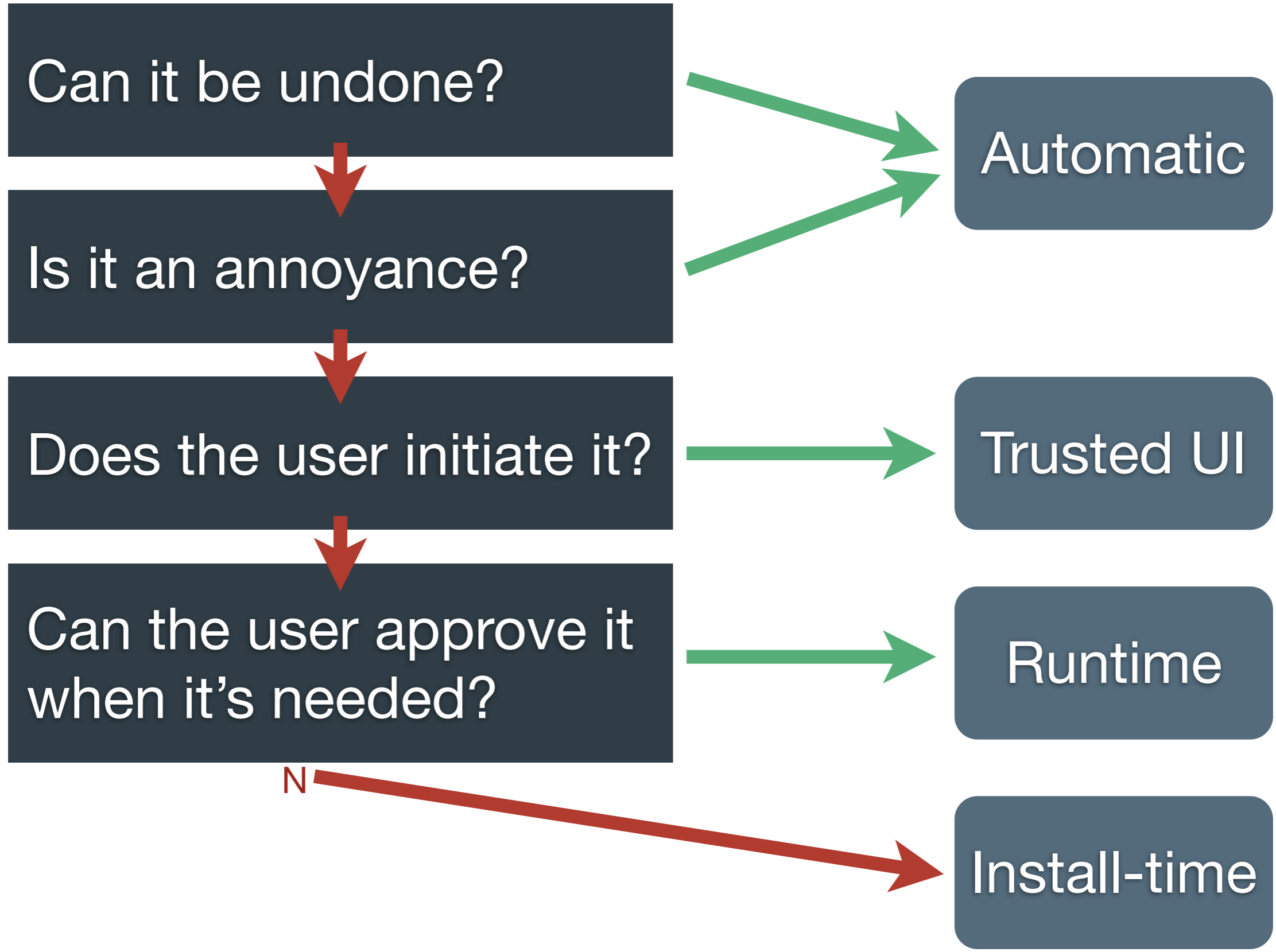
Applicable to all permissions, even advance approval

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