Intruders Versus Intrusiveness: Teens' and Parents' Perspectives on Home-Entryway Surveillance

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Photo taken by the authors.

Internet-Connected Security Devices

- Advantages include:

  - Convenience
  - Remote operation
  - Transparency
  - Auditability

		Type	Source	Time	Description	Device	Format
☐	✉	f(x)	f(x)	15:27:38	_Kwikset Door Lock	3	🔓 ✖
☐	✉	f(x)	f(x)	15:24:02	_Kwikset Door Lock	3	🔓 ✖
☐	✉	f(x)	f(x)	15:23:47	_Kwikset Door Lock	3	🔓 ✖
☐	✉	f(x)	f(x)	15:22:32	_Kwikset Door Lock	3	🔓 ✖
☐	✉	f(x)	f(x)	10:24:19	_Kwikset Door Lock	3	🔓 ✖

☐ Select / Unselect all   Wit

_Kwikset Door Lock   ?

Control   Pin codes   Settings   Advanced   Device Options   Logs   **Notifications**

Room: no r

Add notification for:

Notification name:

- Please select -
A door is locked or unlocked
Bad PIN Code entered
A PIN Code is entered
Lock button is pressed
Lock fails to operate
User code entered outside of valid date
Low battery
Very low battery

Add

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Home security

Teen monitoring

System is
Ready to Arm < >
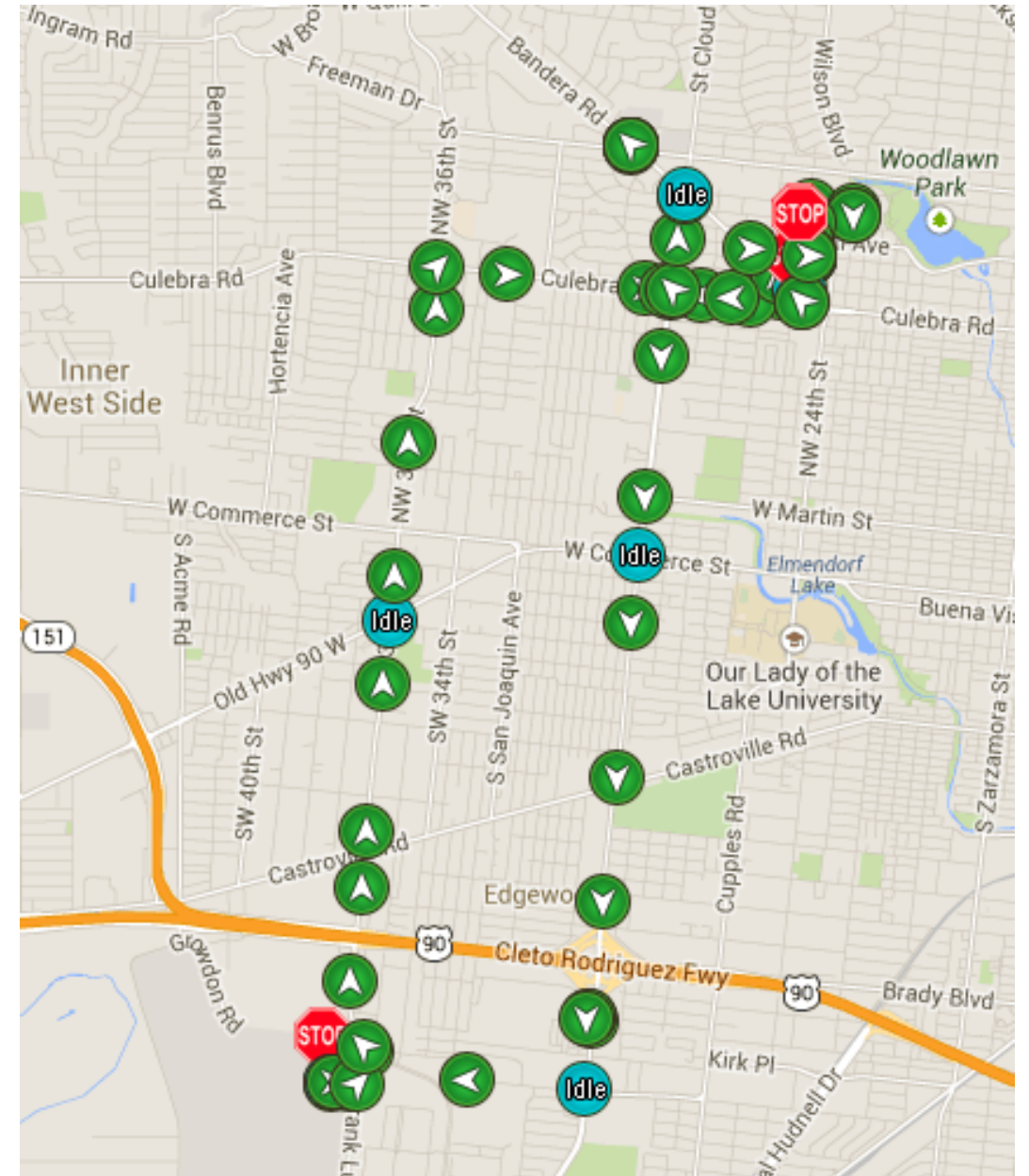
Home security and teen monitoring

Understand teenagers' and parents' perspectives on auditable locks and cameras in the home

Methodology

- Two studies:

    - Interviews of parents and teenagers
    - Online configuration study

Interview Study Methodology

- Interviewed 13 teenagers and 11 parents
  - Recruited from Microsoft's participant pool
  - All from different households
  - Limitation: Not a representative sample
  - Limitation: Hypothetical deployment
- Interviews lasted ~1 hour
  - Compensation: $50 gift card or equivalent

Interview Structure

- Parenting-style survey
- Familiarity with, and use of, home technology
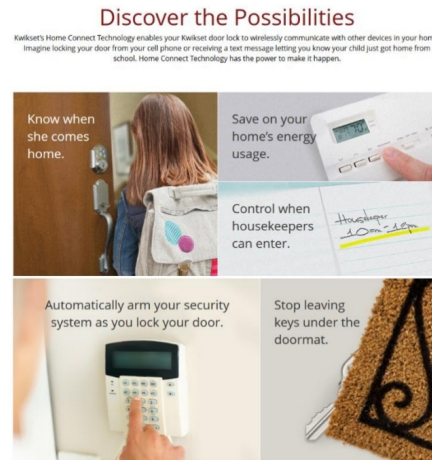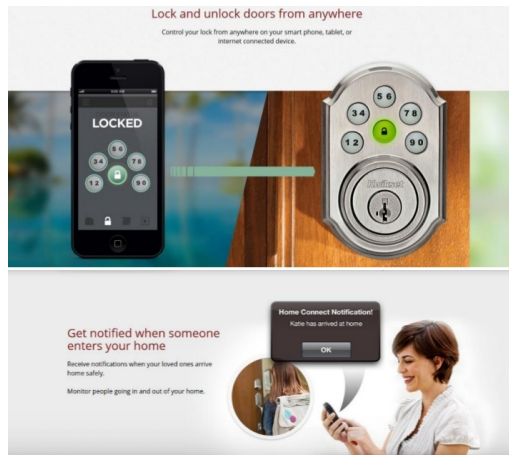
- General reactions to Internet-connected locks
- Use of traditional keys and home security
- Reactions to potential interfaces for audit logs
- Current monitoring practices and attitudes

Images Fair Use from Kwikset and Schlage promotional materials

Analysis

- Transcribed all interviews
  - Two researchers tagged 1,852 quotes as explanatory
- Collaboratively performed affinity diagramming
  - Identified 28 primary themes representing attitudes and influences

Participants

- 13 teenagers (7 male, 6 female)
  - Age 15 – 17
  - Range of family circumstances
- 11 parents (4 male, 7 female)
  - Age 35 – 59
  - Two single parents
  - One parent uses an Internet-connected lock

Participants Liked Connected Locks

- Benefits include:
  - Convenience
  - Added control
  - Safety from burglars
- Drawbacks are:
  - High cost
  - Fear of hackers

Auditing Interfaces

Auditing Interfaces

Photo log

What?	How? / Who?	When?
Rear door ⬀		19 minutes ago
Rear door 🔓	Aurora's Phone	20 minutes ago
Front door ⬀		39 minutes ago
Front door 🔓	Billy's PIN Code	40 minutes ago
Rear door ⬃		4 hours ago
Rear door 🔒	Billy's Phone	4 hours ago

Auditing Interfaces

Text log

What?		How?	When?
Rear door	🔓	Aurora's Phone	20 minutes ago
Front door	🔓	Billy's PIN Code	40 minutes ago
Rear door	🔒	Billy's Phone	4 hours ago

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Auditing Interfaces

No log

Parents' and Teens' Preferences Differed

- All 11 parents preferred photo log

  - "For safety purposes" (P7)
  - "If there was a break-in or a theft" (P10)

- 3 specified monitoring teens as a goal

  - "As my son gets older, I'm going to need to verify if he's coming home alone" (P4)

What?	How? / Who?	When?
Rear door 🔒		19 minutes ago
Rear door 🔓	Aurora's Phone	20 minutes ago
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Front door 🔓	Billy's PIN Code	40 minutes ago
Rear door 🔒		4 hours ago
Rear door 🔒	Billy's Phone	4 hours ago

Monitoring Teens

- Some parents wanted to monitor teens
- Others chose photo log in spite of monitoring
  - "It's just a human nature thing that nobody likes when people keep tabs on anybody" (P2)
  - "I think [my children] would be paranoid or intimidated by the photos" (P6)

Parents' and Teens' Preferences Differed

- 6 teens preferred photo log
  - 4 nonetheless expressed privacy concerns
  - "Kind of weird that they could just always look and see exactly who's over" (T6)
- 3 teens preferred text log
  - Photo "invasion of privacy, `big brother'...thing" (T11)
- 4 teens preferred no log
  - Photo log "would pretty much ruin a strict parent's kid's social life...This is like parents going psycho" (T8)

Current Monitoring Practices

- Unconstrained monitoring (2 parents)
- No monitoring (3 parents)

  - "I'm just waiting to see if she gives me a reason not to let her just be free" (P1)

- Intentionally limited monitoring (6 parents)

  - "I feel like that's a violation of their privacy if I were to [log onto their Facebook]. I know that I have their permission. I know that I have the access. But that's going further than I want to." (P5)

Potential Unintended Consequences

- Reduced parent-teen trust
  - Spend time at friends' houses instead
- Circumvention reducing security
  - Leaving doors unlocked and windows open
  - Removing window sensors
  - Disabling camera

What decisions would parents actually make when configuring an auditable security system?

Methodology

- Online configuration study

  – Access & audit settings for entryway security system

- 19 parents recruited from classified ad sites

  – Compensated with $15 gift card

Configuration Task

Users

First name or nickname	Email address or mobile phone #	Age	Lock PIN	Role	Lock and unlock records can be audited
You, age 50					
Alice	alice@foo.com	50	••••	administrator	only with permission
Husband, age 53					
Bob	bob@foo.com	53	••••	administrator	anytime with notice
Daughter, age 16					
Charlie	202-555-9873	16	••••	user	anytime with notice
Uncle Joe	joe@foo.com	40		user	anytime w/o notice

add user   save

Notifications

Send a notification to [alice@foo.com] whenever [Charlie ▼] [unlocks ▼] the door(s) [add]

Email address or SMS phone #

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Configuration Task

Results

- 4 / 19 participants would allow themselves to be audited without permission or notice

- 8 / 14 participants configured settings to audit spouse/partner without permission or notice

- 19 / 19 participants configured settings to monitor teens without permission or notice

  – "She doesn't have anything to hide, so it shouldn't be a problem"

How can we disentangle decisions about home security and teen monitoring?

Possible Directions

- "Outsource" auditing…
    - …to a security company
    - …to each individual

Possible Directions

- Technology-assisted auditing

  - Face detection
  - Context-sensitive auditing

unknown face

Kristin

Possible Directions

- Change the interaction with logs
    - Pull instead of push notifications
    - Show less granular logs

Image Fair Use from Kwikset promotional materials

Conclusions

- New technologies can alter dynamics in the home

- Parents and teens had differing perspectives on audit

- Privacy and security consequences of conflating decisions about home security and teen monitoring

  - Potential interfaces and interactions that disentangle these decisions

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