Beyond Counting Steps
Using Context to Improve Monitoring of Physical Activity

Ian Li
Anind Dey
Jodi Forlizzi

HCI institute
Carnegie Mellon University
Ubicomp
Activity    Location    People
How can we use contextual information from ubicomp technologies to improve self-awareness of physical activity?
Why might this work?

Awareness of opportunities is critical.

Finding opportunities remains a challenge.

Research with diabetes patients show that associating blood sugar level with food intake improves disease management.
3 Aspects to Explore

Benefits of Contextual Information
Easing the Burden of Manual Recording
Advantages and Disadvantages of Automatic Recording
Approach

Focus on self-reflection

Sedentary people / Walking

User-centered approach
Benefits of Contextual Information
Diary Study

3 weeks
1. No pedometer
2. Pedometer
3. BodyMedia SenseWear

Wrote in diary: activities, location, people
Associated context and steps

P1 matched the peaks on her charts with activities in her journal.

P2 found opportunities for short periods of physical activity, which she called “mini-bursts”
Real-time and Historical Review

Pedometer
- Real-time
- Aggregate counts

BodyMedia SenseWear
- After synchronization
- Detailed counts
7-Week Deployment

Baseline       1 week
Steps-Only     3 weeks
Plus-Context  3 weeks

30 participants
More awareness of opportunities

Plus-Context > Steps-Only

“It turns out I get the most walking done to and from work...and walking around my neighborhood for an hour or two made a difference.” P35
IMPACT was not easy to use

“Plus-Context was a lot of writing”
Easing the Burden of Manual Recording
IMPACT with cellphone and GPS
Other contextual information

How busy the user is

Weather

What other types of contextual information may be useful for physical activity?
Advantages and Disadvantages of Automatic Recording
8-Week Deployment

35 participants

Baseline 4 weeks
Intervention 4 weeks
• Control
• Steps-Only
• Plus-Context
No difference in awareness

Maybe because users were less engaged with data

But contextual information was still valuable.

- Six months later, users who collected contextual information reflected on their data better.
More Questions

What is the balance between cost of monitoring and value of feedback?

What are some effective feedback techniques for users to gain benefit from their data?
Personal Informatics Systems

Physical Activity

Finance

Computer Usage

Health

Mood

MoodJam
Thank you!

Ian Li
ianli@cmu.edu
http://ianli.com/

Funded by NSF QOLT

Quality of Life Technology Center
a National Science Foundation Engineering Research Center