Using Real-Time Mobile Phone Technologies in Physical Activity and Eating Behavior Research

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Why Use Mobile Phones in Physical Activity and Eating Behavior Research?

- Mobile phones are becoming affordable and easy to use
- Mobile phone ownership is common (68% of adults worldwide and 75% of US high school students)
- Widely adopted across SES groups and in developing countries
- Smart phones have built-in accelerometer, GPS, camera, and video technology
- “Apps” can deliver real-time surveys and interventions
- Able to synch with other ambulatory sensors via bluetooth (e.g., heart rate, inhalers, air pollution, UV)

Riley, Rivera, Atienza, Nilsen, Allison & Mermelstein, *Transl Behav Med*, 2011.

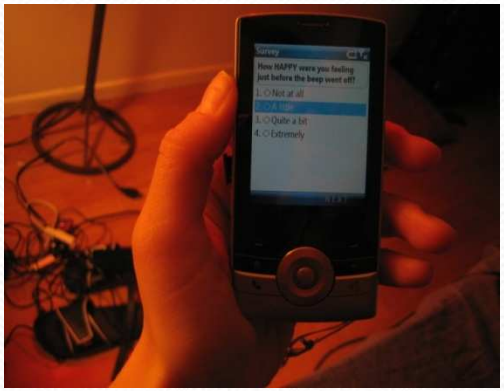
Ecological Momentary Assessment (EMA) and Ecological Momentary Intervention (EMI)

- Real-time interactions in naturalistic settings
- Can measure or intervene on:

  1) Behavior (eating, watching TV)
  2) Where (home, playground, trail, sidewalk)
  3) With whom (alone, friends, siblings)
  4) Perceived characteristics (safety, traffic)
  5) Mood (positive affect, negative affect, stress)
  6) Cognitive/motivational factors (self-efficacy)

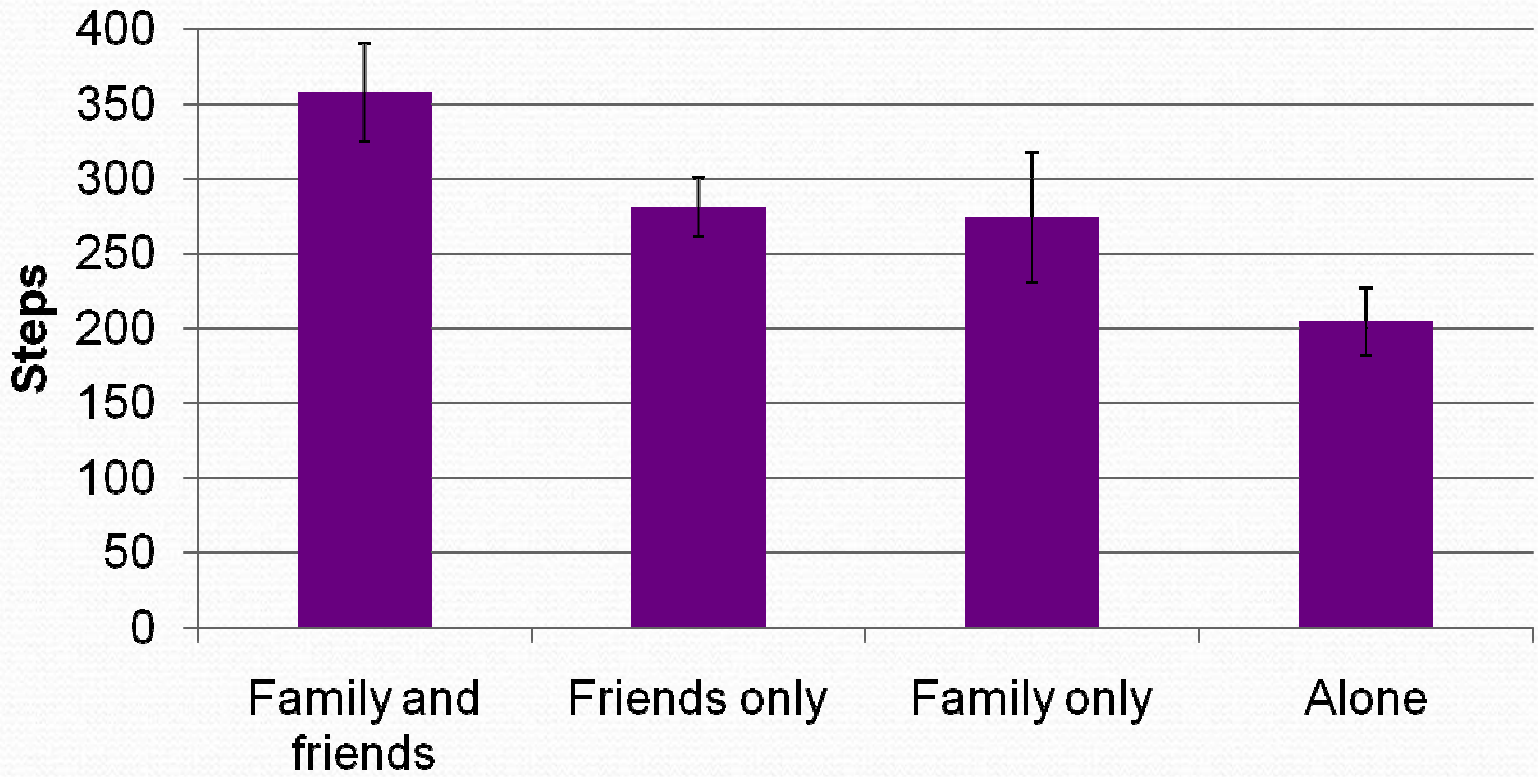
Benefits of EMA and EMI

- Multiple observations/interactions across the day
- Ecological validity
- Context-sensitivity (can assess or intervene when it really matters)
- Reduced memory errors and biases
- Time-stamped
- No manual data entry



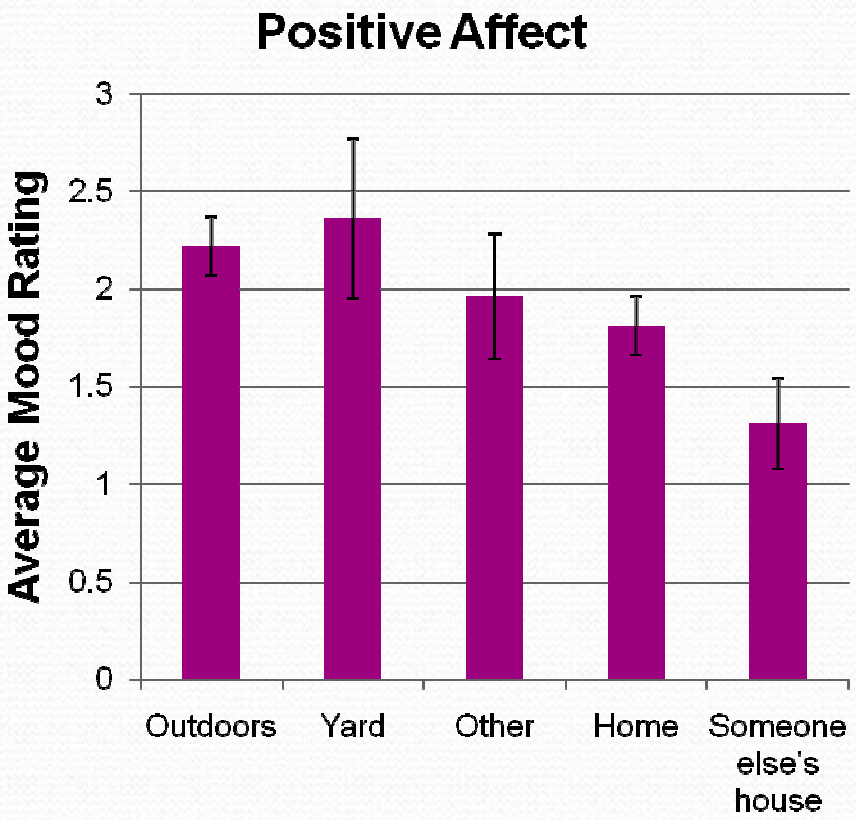
Physical Activity Level by Social Context

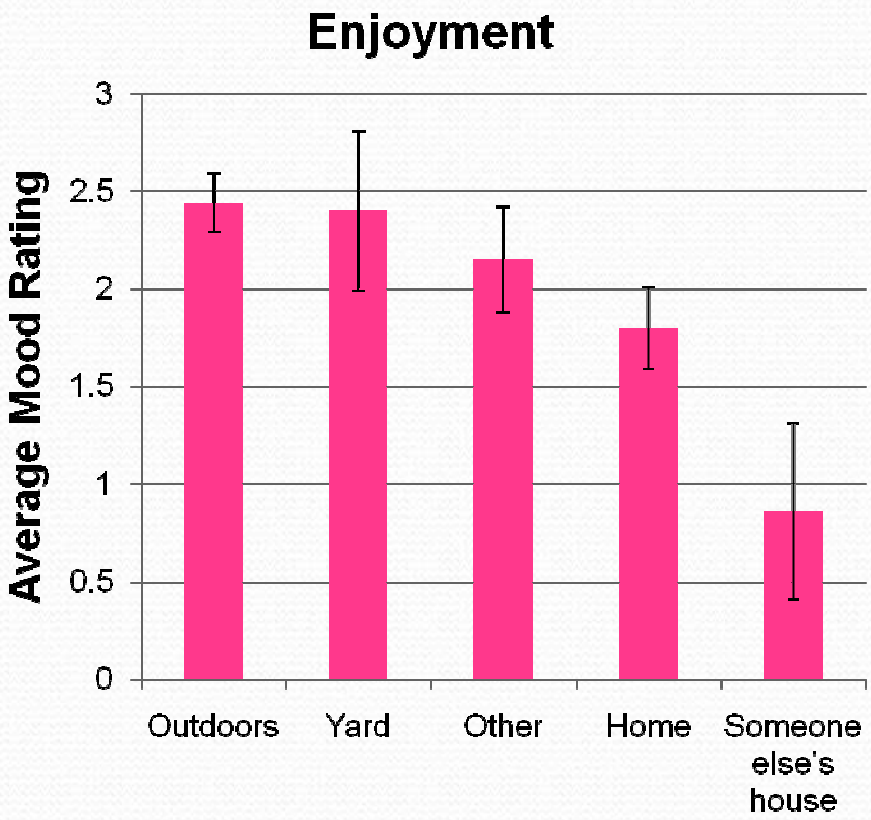
(30-min. before EMA prompt)



Dunton, G. F., Liao, Y., Intille, S., Wolch, J., & Pentz, M. Social and physical contextual influences on children's leisure-time physical activity: An Ecological Momentary Assessment study. *Journal of Physical Activity and Health*, 8(Suppl 1), S103-S108, 2011.

Differences in Affective Response to and Enjoyment of Physical Activity by Context





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Symposium Overview

- EMA of situational triggers to eating in the absence of hunger
- Development of custom mobile phone apps for diet and physical activity research
- Programming and design issues related to the integration of native phone features and external wireless sensors to provide context-sensitive prompting and feedback