Moore Family Center

for Whole Grain Foods, Nutrition & Preventive Health

Nutrition and Health Update Plenary Session

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2:15-3:00 PM

Using Technology to Promote Healthy Eating in Our Youth

Acknowledgement

Video Producer

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Like

Scope and Definition

Using Technology to Promote Healthy Eating in Our Youth

Technology

The methods and tools that a society has developed in order to facilitate the solution of its practical problems.

(Ologies and Isms Thematic Dictionary)

Health and fitness technology

Healthy Eating

Involves moderation, balance, and variety.

(Croll, 2001)

But it doesn't matter now.

Youth

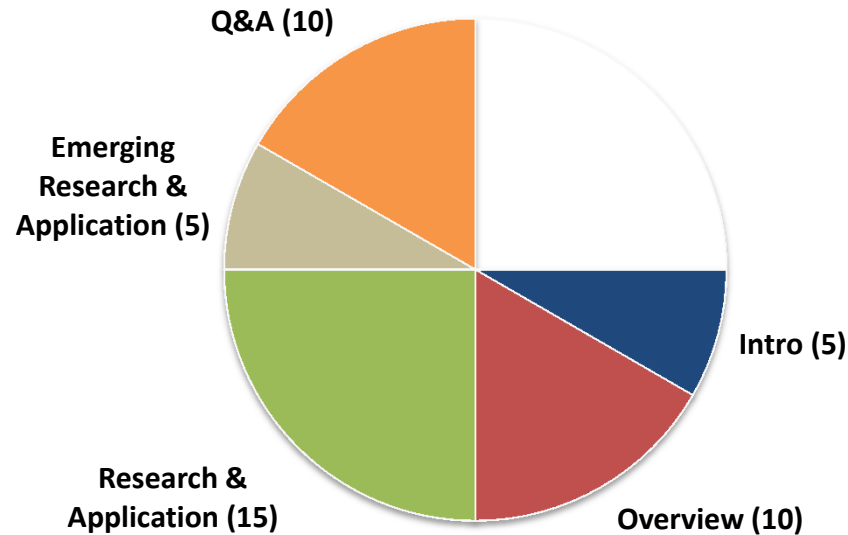Adolescent ~ Young Adulthood

Ages 12-24

(Modell & Goodman, 1990)

~

Ages 18-22

(Kenniston, 1970)

Outline

A. Overview of Evolution in Health and Fitness Technology

B. Related Research and Applications

C. Emerging Research and Applications

D. Question and Answer

A. Evolution In Health And Fitness Technology

1920s: Refrigerator

1950s: Home-use microwave oven

1970s: Personal computer, hand-held mobile phone, video games
reached mainstream popularity

1980s: @Palmtop

1990s: WorldWideWeb, Bluetooth, Google

2000s: Wikipedia (2001), Facebook (2003),
Second Life (2003), YouTube (2005),
My Fitness Pal (2005), iPhones (2007)
Open Sim (2007), Android (2008),
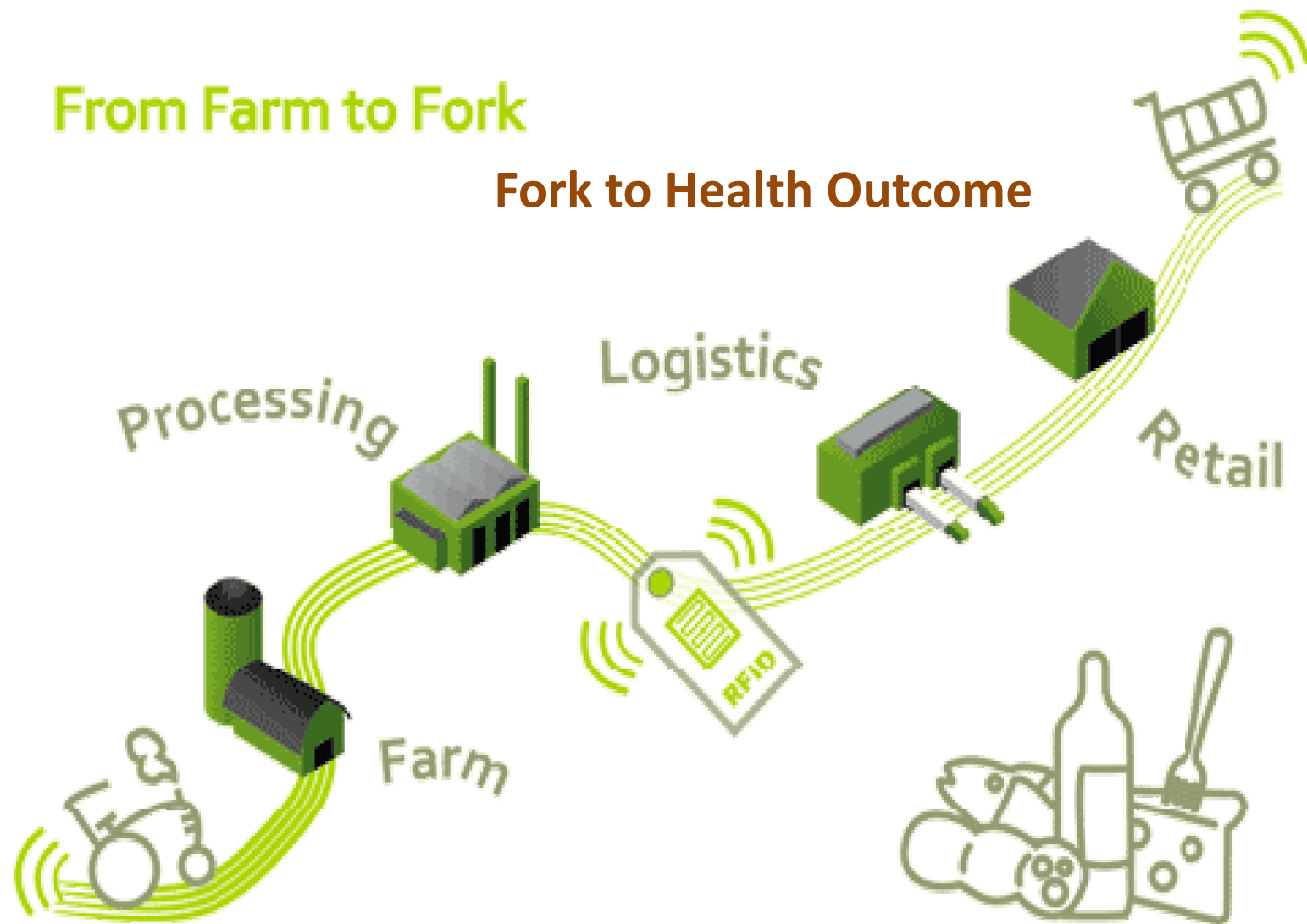
A. Evolution In Health And Fitness Technology

2011: USDA MyPyramid Tracker

2013: USDA SuperTracker Food Tracker

From Farm to Fork

Fork to Health Outcome

Processing

Logistics

Retail

Farm

RFID

B. Related Research and Applications

School-Based Interventions (5)

Home-Based Intervention (1)

Afterschool and Camp-Based Interventions (2)

Medical Setting Intervention (1)

(Whiteley 2008)

B. Related Research and Applications

School-Based Interventions (5)

	Approach	Sample size (intervention /control)	Intervention Period	Theory
Winett, 1999 *Eat 4 Life*	Web-based learning modules	103/77	45 min/week for 5 weeks	Social Cognitive Theory
Reed, 2002 *Clueless in the Mall*	Scavenger hunt game	148	50 mins	Precede-Proceed Health Education Planning Model
Frenn, 2005	Web + 4 videos (2-3 min each)	43/60	8 x 45 min in 1 month	Health Promotion, Trans-Theoretical Model
Long, 2004	Web + Classroom	63/55	5hr Web + 10hr classroom in 1 month	Social Cognitive Theory
Long, 2006	Web	21	5hr over 3 weeks	- none -

B. Related Research and Applications

(School-Based Intv.)	Winett, 1999	Reed, 2002	Frenn, 2005	Long, 2004	Long, 2006
Regular meals (freq)	↑			*no change*	
Fruit intake	↑			*no change*	*no change*
Veg intake	↑			*no change*	*no change*
Soda intake	↓			*no change*	*no change*
Fat intake			↓		↓
Ca knowledge		↑			
Ca attitude		↑			
Dietary knowledge				↑	
Self-efficacy for eating adeq. Fruit				↑	
Self-efficacy for eating adeq. Veg				↑	
Self-efficacy for lower fat intake				↑	

B. Related Research and Applications

(School-Based Intv.)	Winett, 1999	Reed, 2002	Frenn, 2005	Long, 2004	Long, 2006
Lack of control group		X		X	X
Nonrandomized assignment to groups	X	X	X	X	X
Use of self-report measures only					X
Short intervention period					X
Lack of follow-up			X	X	X

Mobile Phone-Based Game (Pollack, 2010)

**Target audience:** 7th and 8th graders (n=53)

**Location:** A rural middle school in upstate NY

Duration: 1 month

Method: Take care of a virtual pet using an iPhone to track daily breakfast intake and quality.

Results: Intervention group ate a healthy breakfast 52% of the time. Control group ate a healthy breakfast only ~20% of the time. No gender effect. Players needed + and – feedbacks from their virtual pet.

Mobile Phone-Based Game:

Time To Eat

(Pollack, 2010)
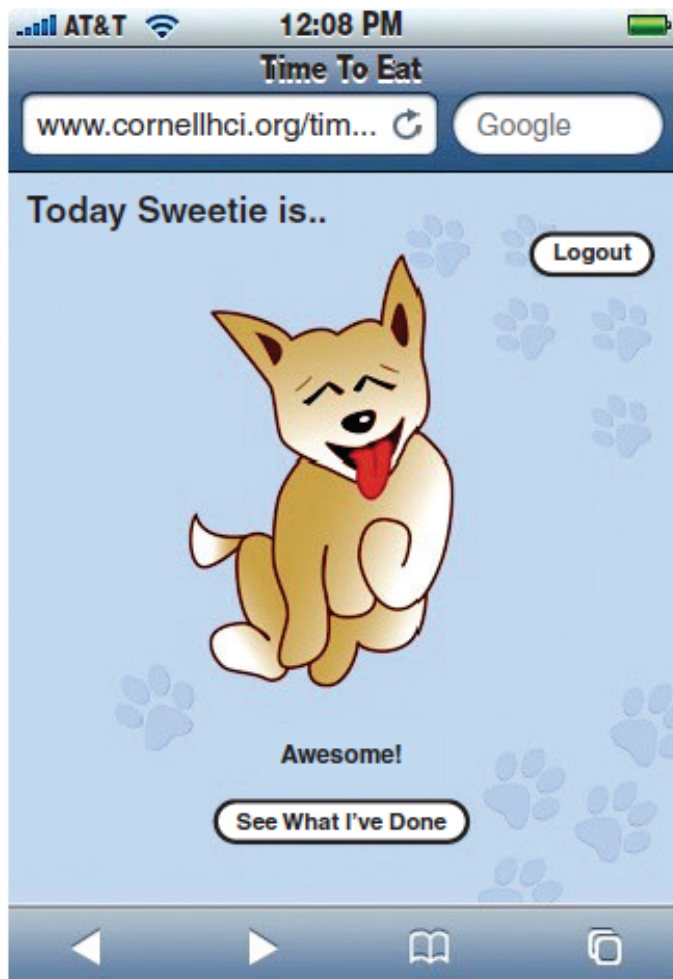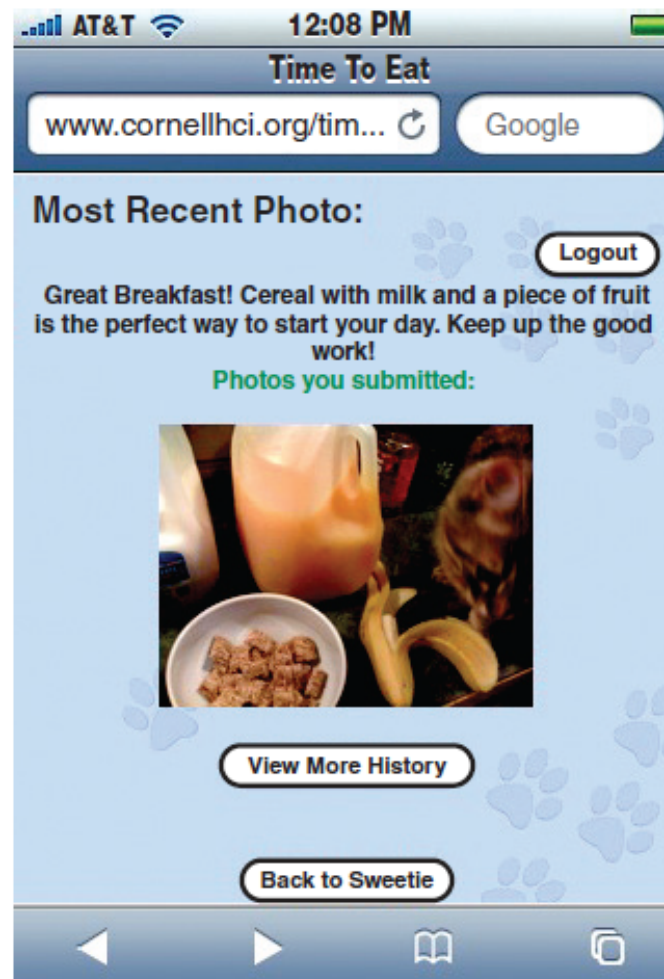
Figure 2. The Time to Eat user interface: (a) the home screen, depicting the pet's current emotional state and (b) the feedback screen with the corresponding food photo. The pet's emotional state reflects the quality of meals the player has recently eaten and submitted. Navigating to the feedback screen lets players see recent photos and their corresponding feedback and hopefully make a connection between their actions and their pet's state.

B. Related Research and Applications

Scaling Up: Provide incremental rewards

Social:

Chat, competition between peers, ability to view and comment on another's pet.

Game level:

- Increases with pet's interaction capabilities (e.g., play fetch, walk pet, bathe pet)
- Unlocks certain items (e.g., after eating 3 healthy balanced meals, a player could unlock a new outfit for the pet or choose a new toy for it)

B. Related Research and Applications

Scaling Up: Provide incremental rewards

Efficiency for immediate feedback:

Let peers rate each other's breakfast quality; AI to detect food and portion size.

Geotagging:

Place 'What + Where + When' on the map → reveal eating habits and problem areas → strengthen tailored prompts/warnings/recommendations.
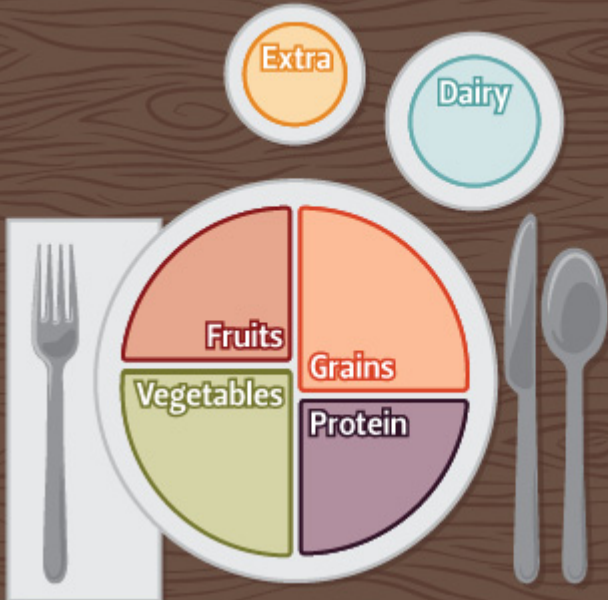
(Pollack, 2010)

Evolution of New Media

Category	Environment	Level of Embodiment
Text Chat	Textual only	On screen text displays
Audio Chat	Audio	Voice and icon
Text MUDS and MOOS	Textual only	On screen text displays
Pictorial social environment	2D pictorial environments and text	User represented by 2D avatar
3D Networked	3D interactive virtual environment	User represented by 3D avatar with various levels of expressive capability
Highly immersive networked virtual environments	Body surrounding 3D virtual environments	Avatar and user's body occupy same position in space. Natural body motion as input and immersive displays

(Biocca, 2000)

Better Eating Starts Today (B.E.S.T.) Project
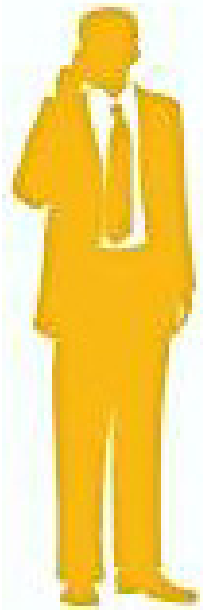
Of the 7 billion people in the world,

4 billion

use a mobile phone while 3.5 billion
own a toothbrush

Virtual care beyond hospitals

Smart Refrigerator

2013

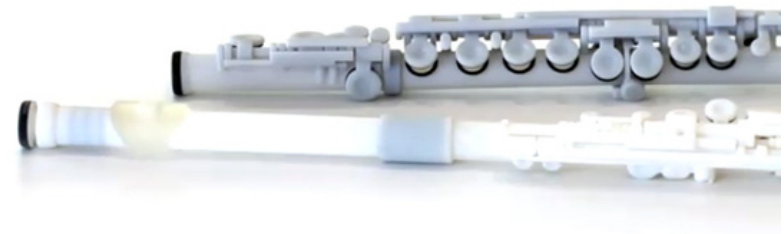Barcode Scanning
Microwave

Internet-
controlled
refrigerator/oven

3D Food Printer

3D Printed Flute

Opportunities and Challenges
from paper to electronic

Mobile Health advancement

Research advancement

C. Emerging Research and Applications

Real-world experience converging with virtual-world experience.

Research

Education

C. Emerging Research and Applications

New Trend: The Data Will Follow You

SoLoMo
Social – Local - Mobile

Interoperability
Linked health records

Seamless/mindless tracking
Just check-in

C. Emerging Research and Applications

New Trend: **The Data Will Follow You**

Goal setting
Don't just 'meet' the goal, 'crush' it!

Personal touch
Nurse follows up with a phone call; tailored message to current location, calendar, social network in proximity, habits and preferences

C. Emerging Research and Applications

Recommendations for future interventions:

1. Adequate sample size
2. Randomized designs
3. Objective measures
4. Males and females
5. Health disparity youth
6. Longer intervention period
7. Theory-based skill building
8. Real-world + virtual world
9. Involvement of parents/caretakers
10. Innovative engagement to sustain interest

(Whiteley 2008)

D. Question and Answer

References

Biocca F. New media technology and youth: trends in the evolution of new media. Journal of Adolescent Health 2000;27S:22-29.

Croll JK, Neumark-Sztainer D, Story M. Healthy eating: what does it mean to adolescents? JNEB 2001;33:193-198.

Kenniston K. Youth: A "new" stage of life. American Scholar 1970;39:631-641.

Modell J, Goodman M. Historical Perspectives. In Feldman S and Elliot G (Eds.), *At the threshold: The developing adolescent*. Cambridge, MA: Harvard University Press, 1990; 93-122.

Pollak JP et al. It's Time to Eat! Using mobile games to promote healthy eating. IEEE Persuasive Computing 2010; 21-27.

Thai AM et al. Game changer: investing in digital play to advance children's learning and health. 2009. Available at http://www.joanganzcooneycenter.org/wp-content/uploads/2010/03/game_changer_final_1_.pdf.

Whiteley et al. State of the art reviews: Using the internet to promote physical activity and healthy eating in youth. American Journal of Lifestyle Medicine 2008; 2(2):159-177.