Gerontechnology I

Psych 485 / CptS 485

Fall 2017
Dr. Diane J. Cook
Dr. Maureen Schmitter-Edgecombe

Today's Class

- Gerontechnology Overview

- Class and Syllabus Details

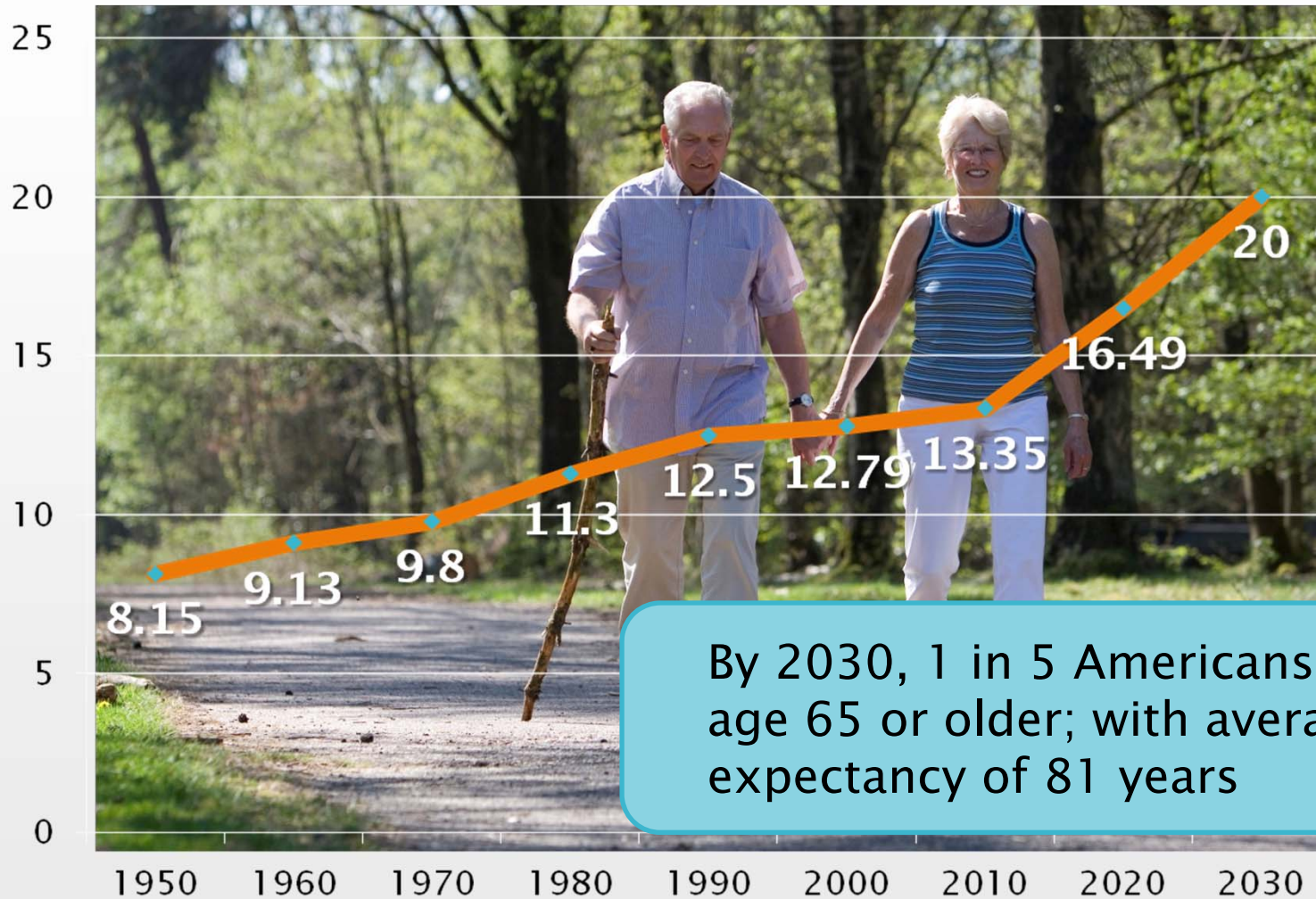- Service Learning Details

Introduction to Gerontechnology

Did you know...

- Everyday in the United States
  - 6,000 Americans celebrate their 65th birthday
  - 3,800 American celebrate their 85th birthday

- American seniors now outnumber the entire population of Canada: currently at 35 million people
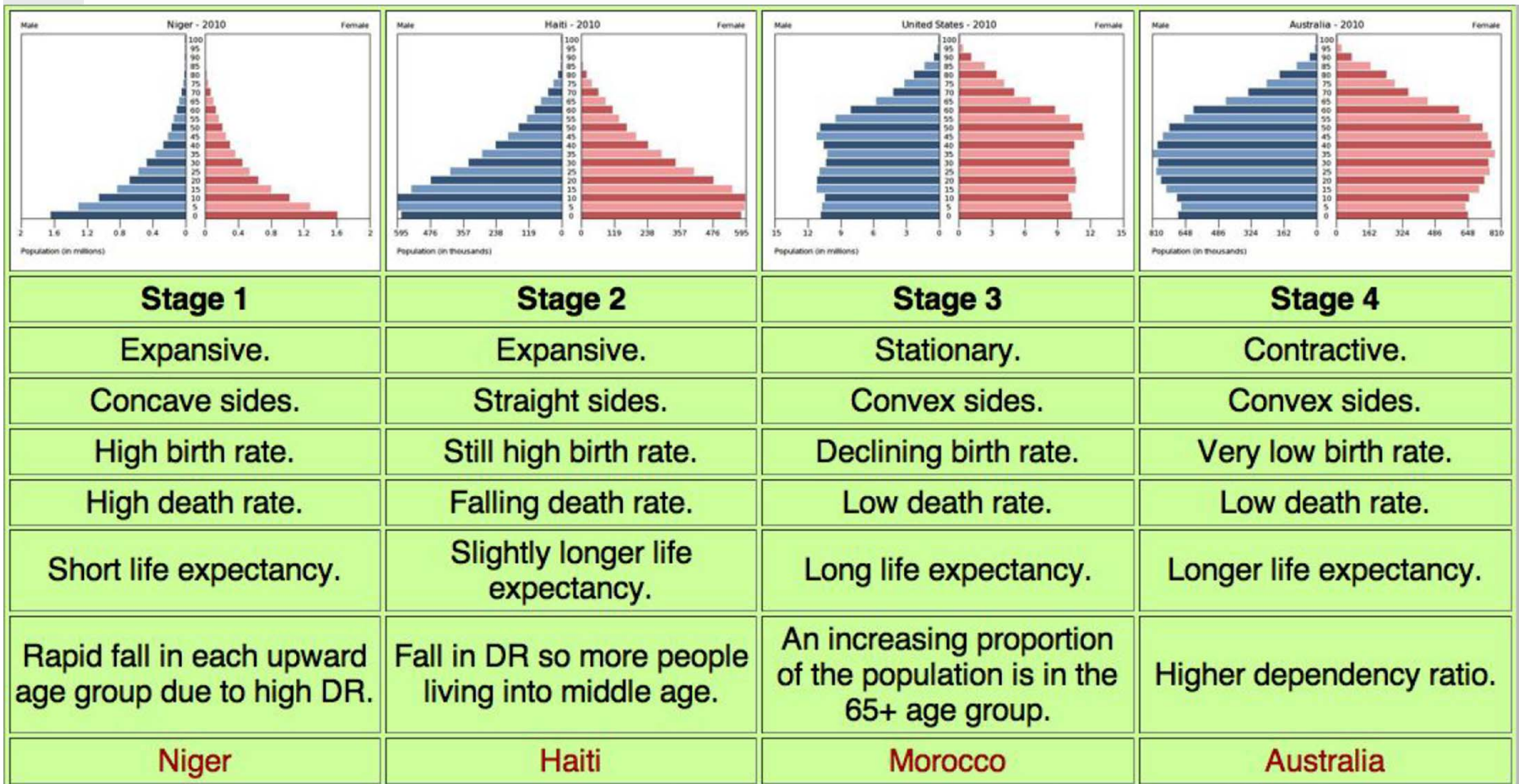
Aging of America

Trend in percent of individuals 65+

By 2030, 1 in 5 Americans will be age 65 or older; with average life expectancy of 81 years

The Changing Nature of Population Pyramids

The demographic transition of developing nations

Stage 1	Stage 2	Stage 3	Stage 4
Expansive.	Expansive.	Stationary.	Contractive.
Concave sides.	Straight sides.	Convex sides.	Convex sides.
High birth rate.	Still high birth rate.	Declining birth rate.	Very low birth rate.
High death rate.	Falling death rate.	Low death rate.	Low death rate.
Short life expectancy.	Slightly longer life expectancy.	Long life expectancy.	Longer life expectancy.
Rapid fall in each upward age group due to high DR.	Fall in DR so more people living into middle age.	An increasing proportion of the population is in the 65+ age group.	Higher dependency ratio.
Niger	Haiti	Morocco	Australia

Pillars of Successful or:

"Good" Aging"

- Healthy nutrition

- Daily physical exercise

- Regular cognitive and mental activities

- Maintaining social contacts inside and outside the family

- Keeping an active interest in society

Age-related Changes

- Smell & Taste

- Vision & Hearing

- Muscle Mass, Strength & Mobility

- Cognition

- Functional abilities

- Age-related Diseases

8 scripted tasks

Fill medicine dispenser
Watch a DVD
Water plants
Talk on phone
Write birthday card
Prepare a meal
Sweep and dust
Select an outfit

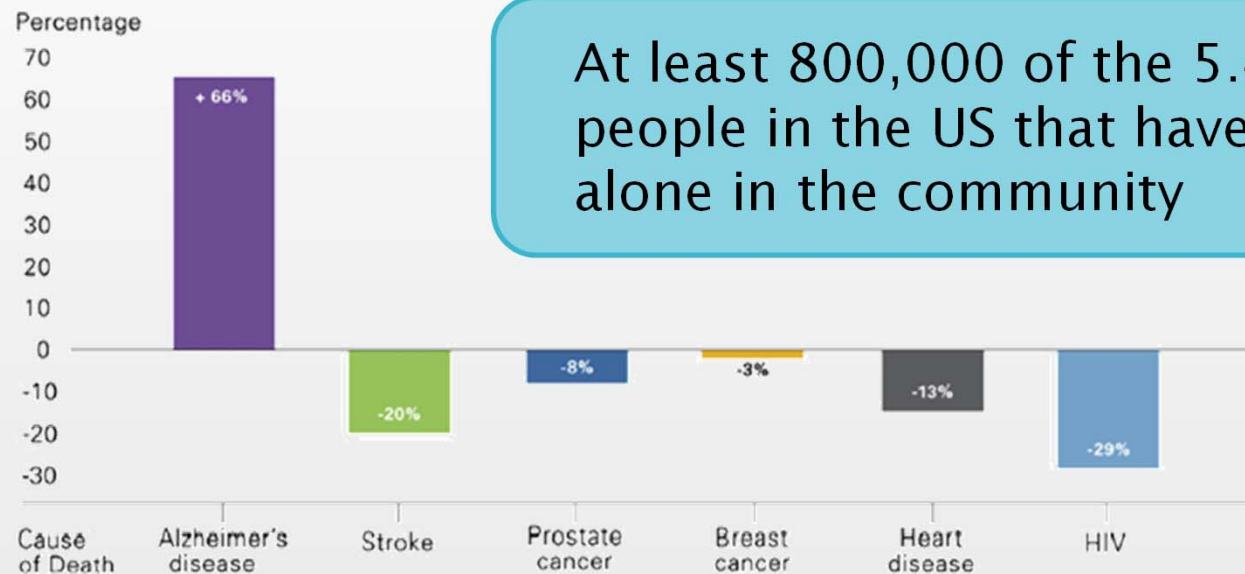|	Middle-Aged	Young-Old	Old-Old	MCI
Age	54.55	67.14	80.00	70.86
Education	16.95	16.91	16.77	15.56
Activities Score	11.18	13.55	16.45	18.04

Lets try this

Estimated Prevalence of Alzheimer's disease (AD)

by Age

Nearly 45% of individuals age 85 and older are estimated to have Alzheimer's disease

At least 800,000 of the 5.4 million people in the US that have AD live alone in the community

Percentage

70	
60	+ 66%
50	
40	
30	
20	
10	
0	
-10	-8% -3% -13%
-20	-20%
-30	-29%

Cause of Death | Alzheimer's disease | Stroke | Prostate cancer | Breast cancer | Heart disease | HIV
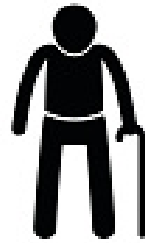
Care-partners Health

Care-partners of individuals with AD experience higher levels of emotional distress and physical health problems than other care-partners and non care-partners

The Circle of Care for Seniors

All stakeholders in the Circle need new tools.
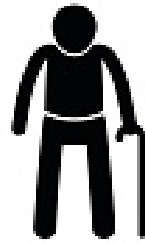
Self Care

Administrative / Tech

Clinicians

Family

The Circle of Care for Seniors

All stakeholders in the Circle need new tools.

Consider needs of all members of the aging population: the sick, the frail, the healthy, the professional caregivers, the informal caregivers

Self Care

Administrative / Tech

Clinicians

Family

Gerontechnology

- Interdisciplinary academic and professional field
  - Gerontology
  - Technology

- Use technology to study aging
- Design technology to provide solutions to deal with the challenges of aging

- Relatively young field, emerged in 1990s

- Very multidisciplinary!

WSU History of Gerontechnology

Gerontology

- Neuropsychological tests
- Memory notebook

Technology

- Smart Home in a Box
- Activity recognition / prediction

Gerontechnology
since 2007…

- Automated health diagnosis
- Automated intervention
- Automated impact analysis for different technologies
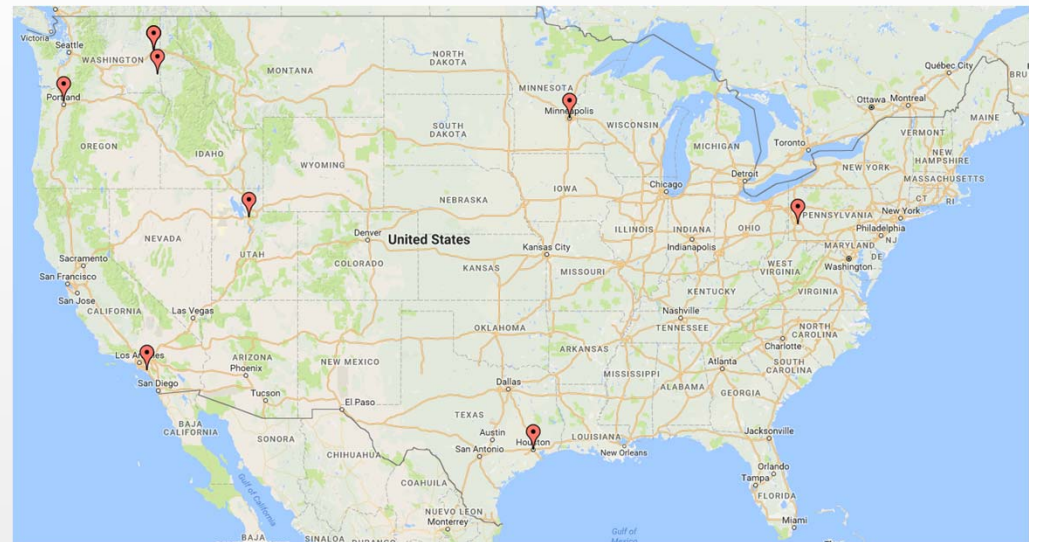
What we offer you in this class

- **Classroom training**

  - Research methods
  - Smart environments
  - Sensors
  - Machine learning
  - Activity recognition
  - Ethics
  - Aging and senses
  - Aging, mobility, and exercise
  - Aging, cognition, and everyday function

What we offer you in this class

- **Guest speakers**

  - Intervention compliance
  - Technology acceptance
  - Clinician in the loop smart homes
  - Memory and thinking
  - Iterative design
  - Working with rural communities and Indian reservations
  - Designing training interfaces for individuals with diabilities
  - Sleep, circadian rhythms, learning, and memory

What we offer you in this class

- **Other unique components**

  - Service learning
  - Multidisciplinary team projects
  - Working with smart watches and machine learning toolset

What we ask you to do in this class

- Service learning project
- Critical questions
- Summaries of guest speakers
- Homework assignment
- Research project
- Participate in class!

Class Syllabus

Gerontechnology I

Fall 2017

Tuesdays / Thursdays 9:10 – 10:20

Course Instructors

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Course Web Page

The class web page is available at http://eecs.wsu.edu/~cook/gt1. Most of the class materials are available online, including the syllabus, homework assignments, papers, and lecture materials. *Instructional materials can be accessed at this web page.*

Catalog Course Description

Psych 485 / CptS 485 Gerontechnology I 3 Course Prerequisite: Certified in major or consent of instructor.

Required Instructional Material

Given that this is an emerging area of study, there are no available textbooks that fully cover the integrated aspects of the course material. Instead, students will be reading original research articles as well as book chapters to develop both breadth and depth in the subject matter of Gerontechnology. A list of reading materials that may be updated to include additional readings can be found at the end of the course syllabus. There are a few Gerontechnology books that are available as optional resources, these are listed at the end of the syllabus as well.

Course Overview

In this class, we will introduce the principles of Gerontechnology, an interdisciplinary field that combines gerontology and technology. The class will consist of lectures, group discussion, guest presentations, an experiential component working with older adults, and a multi-disciplinary research project. It is assumed that students enrolled in Gerontechnology I will also register and complete the follow-on class in the spring, Gerontechnology II. Following completion of this course, students should (1) have an understanding of the major topics of research in Gerontechnology, (2) have a basic understanding of the aging process and research methodology in aging, which will provide the foundation for development of assistive technologies, (3) have a working knowledge of basic technologies that are used to monitor, assess and assist the health of older adults, and (4) have gained experience working with older adults and in multi-disciplinary research teams.

Guest Speaker Summary

Grade = 0

Class Syllabus

Grade = 1

Dr. Cook talked today in class. She gave an overview of Gerontechnology. Her talk was very informative.

Class Syllabus

Grade = 2

Dr. Cook talked today in class and gave an overview of Gerontechnology. This overview included a motivation of why it is important to design and study technologies to assist with aging. (detail about relationship with other class discussions here)

Class Syllabus

Grade = 3

Dr. Cook talked today in class and gave an overview of Gerontechnology. This overview included a motivation of why it is important to design and study technologies to assist with the challenges of aging. (detail about relationship with other class discussions here)

This discussion raises questions on the extent to which technology can address aging challenges. Can technology allow individuals to remain functionally independent in the face of debilitating diseases such as Alzheimer's? What is the limit of the benefits for current technology?

One point that was not discussed in the lecture was what types of devices are considered technology. For example, eyeglasses, wheelchairs, grab bars, and bath mats currently help older adults. The boundaries of assistive technology may very well move over time.

Example Critical Question

Dr. Fritz's paper described a method for identifying health events from smart home sensor data. What types of health events cannot be detected from this type of data?

Submission through Blackboard

Service Learning Visitor