The social problem

- Increasing prevalence of behavioral health issues:
  - Obesity
    - 33.8% of US adults
  - Alcoholism
    - Estimated to affect 10-20% of US males and 5-10% of females sometime in their lifetimes
  - Other forms of substance abuse

- US life expectancy is forecast to decrease for the first time (CDCP, 2011)

The social problem continued...

- It's economically impossible to provide health counseling for 13 million obese children much less preventive care for the children who are at risk of obesity or the rest of the population
- We can’t train tens of millions of new behavioral medicine people
- We can only solve this problem through automation

And it gets worse...

- The average American reads at the 8th grade level, 3 to 4 grades below last grade completed
- 20% read below the 5th grade level (Neuhauser & Kreps, 2011)
- Most health information is written above the 10th grade level
- So not only do they not want to read the NIH web pages, many are not able

What are avatars?

- Avatars or Embodied Conversational Agents are:
  - digital anthropomorphic virtual characters
  - who can enter into a dialog with their users
  - by speaking in natural languages
  - using natural non-verbal social cues
  - and who can live on a PC at home, on the internet, or even on a mobile phone

Avatars can help solve the social problem

- Avatars that deliver computer-based interventions (CBIs) for behavior change can:
  - increase accessibility because we know that people accept computer-based assessment and feedback programs (Skinner, 1994; Cunningham, 1999) and avatars can be programmed to deliver these
  - address low literacy problem by talking in the native language of the patient
  - reduce high attrition rates of current CBIs because physical embodiment increases engagement and social facilitation (Zajonc, 1965)
  - increase confidentiality and divulgation because people that engage in high-risk behavior tend to report more information to a computer interviewer than to its human counterpart (Servan-Schreiber, 1986), so these CBIs can address issues that would otherwise be ignored

Avatars can tailor health interventions

- Avatar-based interventions can:
  - tailor information to the patient/consumer’s specific needs by creating and dynamically updating a patient profile from repeatable self-monitoring assessments, which we know leads to better patient outcomes than generic communication (e.g. brochure)
  - implement patient-physician concordance, which is strongly linked to the quality of healthcare processes, by matching the patient race/language instantly; even though African, Hispanic and Native Americans represent more than 25% of the US population, they only comprise fewer than 9% nurses, 6% physicians, and 5% dentists (Cooper & Power, 2004)

Avatars can build working alliance

- Avatar-based interventions can:
  - provide working alliance - the most important predictor of positive patient outcomes - because people do develop personal relationships with computers that give social cues (Reeves & Nass, 1996)
  - exhibit infinite patience that human counselors often lack in order to help patients find intrinsic motivation to change (Miller & Rollnick, 2002)
  - display empathy via their verbal and nonverbal communication abilities and their growing knowledge of their patient, unlike other CBIs
  - diminish existing 25-100% variability in counselor’s rates of improvements among their patients

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