10 Advantages of using Avatars in Patient-Centered Computer-based Interventions for Behavior Change

Christine Lisetti
Affective Computing Social Computing Laboratory
Florida International University
11200 S.W. 8th Street
Miami, FL, USA
lisetti@cis.fiu.edu

Recent epidemics of behavioral issues such as obesity, excessive alcohol, tobacco, and drug use, place people at risk of diseases (e.g., diabetes, cardiovascular troubles) which can often be prevented by lifestyle changes such as losing weight with a diet and/or physical exercise. Medicine has therefore started to move toward finding ways of preventively promoting wellness rather than solely treating already established illness. Health promotion interventions aimed at helping people to change lifestyle are being deployed, but the epidemic nature of these problems calls for drastic measures to rapidly increase access to effective behavior change interventions for diverse populations. We posit that not only is automation needed, but that computer-based interventions (CBI) delivered by empathic virtual avatars also offer complementary advantages to human healthcare, listed below:

1. **increase accessibility**: as few as one or two short lifestyle change interventions often yield greater change than no counseling at all (Miller&Rollnick, 2002), and yet these short interventions are often unavailable. Because people accept computer-based assessment and feedback programs (Skinner, 1994; Cunningham, 1999) and because these can easily be reproduced (e.g. PC, web, mobile applications), CBIs can increase accessibility to health interventions;

2. **increase confidentiality and divulgence**: patients that engage in behavior that can put them at risk report more information to a computer interviewer than to its human counterpart (ServanSchreiber, 1986). Provided with sensitive information that a human would not have access to, CBIs can address issues that would otherwise be ignored;

3. **tailor information**: tailored communication, intended to reach one specific person’s needs vs. generic communication (e.g., a brochure), lead to better patient outcomes and are derived from individual assessment. CBIs can assess and create a user profile to deliver tailored information, and dynamically update the user profile over multiple adaptive sessions;

4. **diminish variability**: there exists wide variability (25%-100%) in different counselor’s rates of improvement among their patients (Miller&Rollnick, 2002). When trained personnel is not available, a good CBI can eliminate variability, providing more people with motivating experiences;

5. **avoid righting reflex with infinite patience**: Counselors often experience the righting reflex, or the tendency to set things right by employing direct advocacy, thereby acting out patients’ ambivalence toward change. But providing extrinsic motivation is not conducive of change, and successful counselors are ones who can inhibit their righting reflex (Miller&Rollnick, 2002). Though we thrive to build humane computers, computers inherently do not have the righting reflex and can respect patients’ pace toward change (Prochaska, 1997) by demonstrating infinite patience;

6. **address low literacy**: most efforts to provide patients with web-based interventions use text to communicate. The average American reads at the 8th grade level and 20% read below the 5th grade (Neuhauser&Kreps, 2011). So not only do they not want to read webpages, many are not able. Similar issues arise for technophobic users. Embodied conversational agents (ECAs) (Cassell, 2000) are virtual characters who use synthetic text-to-speech to communicate, and who can thereby shrink the literacy divide for low reading and/or computer literacy populations (Lisetti&Wagner, 2008);

7. **reduce high attrition rates**: physical embodiment and presence increases important and social facilitation (Zajonc, 1965). When people anthropomorphize a computer character, they get more engaged, interact socially and attempt conversational grounding (Reeves&Nass, 1996; Kiesler et al., 2008). Avatar-based interventions can address high attrition rates found in current CBIs by increasing engagement;

8. **implement patient-physician concordance**: there is a strong link between race/language concordance and the quality of healthcare processes. Yet, 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). While ethnic diversity among health professionals is being increased, ECAs’ racial features can already match the patient’s race, and immediately help fill the current race concordance gap, because people respond to ethnicity in ECAs in the same way as with humans (Nass&Ibister, 2003);

9. **provide working alliance**: a strong patient-physician working alliance is one of the most important predictors of positive patient outcomes. With their anthropomorphic features, ECAs provide strong social cues and people can develop personal relationships with them (e.g. coach, companion) (Cassell, 2000) similar to a working alliance;

10. **express empathy**: the ability for health practitioners to exhibit empathy is crucial for success (Miller&Rollnick, 2002). Early research shows that it is feasible to model empathy (Gratch et al., 2011) and further progress will enable people to count on long lasting supportive relationships with their cyber help agents for health promotion.