Beyond Social Media: Advanced Technologies in Social Work Practice

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The Mindset: Starting Assumptions

• Technology is not a panacea

• Human contact cannot be replaced
  – Too complex
  – Too emotionally subtle

• But - technology has much to contribute
  – Adaptive, affective intelligent technologies exist today
  – Social agents & robots don’t get tired or impatient
  – Technology is available anywhere, 24/7

• Technology as an adjunct to face-to-face therapy
Outline

• **Learning objectives & Overview**
  • Virtual agents & social robots
  • Serious affective games
  • Virtual reality therapy
  • Telemental health
  • Implications – “take aways”
  • Conclusions

Learning Objectives

• Learn about advanced technologies
  – Virtual affective agents
  – Social robots
  – Affective serious games for therapy
  – Virtual reality therapy
  – Telemental health

• Understand their potential for enhancing clinical practice

• Learn how to critically evaluate particular technology
  – Distinguish ‘hype’ from reality
  – Evaluate potential for enhancing practice
Why the Title “Beyond Social Media”?

• Many clinicians have mixed feelings about technology (and rightfully so!)

• Technology can save time – (e.g., electronic health records), but can also create much frustration (e.g., electronic health records)

• Technologies can contribute to social isolation (e.g., obsession with electronic games)

• Technologies can dehumanize our relationships: Can you really have two hundred close friends? (see Turkle)

• BUT – emerging technologies such as “affective computing” and “social computing” can provide more human-like interaction

So What Do We Mean by ‘Advanced Technologies’?

• Intelligent

• Adaptive

• Affective

• Social
Are Various “Apps” Advanced Technologies?

- Not yet, in majority of cases
  - E.g., mood tracking, meditation aids, encouraging messages on your phone

- But the potential is certainly there
  - Affective virtual coaches & therapeutic games can exist on mobile devices

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… thinking about artificial agents & robots

- Remember your favorite stuffed animals from childhood?
- Remember pet rocks?

- We are ‘wired’ to build relationships …. even with inanimate artifacts

- “Computers as social actors” (Reeves & Nass)
Consider Two Examples

• “Eliza” (1966)
  – Computer program that ‘simulates’ a Rogerian therapist
  – No underlying intelligence
  – Simple, even silly
  … BUT consider this: People spent hours “talking” to Eliza & commented on her empathy

• “Her” (2014)

Wired to Connect

• Can the innate human need & ability to connect be used to enhance clinical practice?
What if....

• Your clients struggling with recovery could get customized, empathic support from a virtual coach on a mobile device – anytime/ anywhere?

• Your child client on the autism spectrum could play with a social robot to learn social skills?

Definitions

• Synthetic, computer-controlled ‘characters’ & robots that can interact with humans & have some human-like qualities

• Virtual affective agents
  – Non-physical agents on computer screens
  – Different embodiments
    • “Talking head”
    • Upper torso w/ hands
    • Full 3D body

• Social robots
  – Physical agents capable of movement in the real-world
Human-Like Qualities

• Artificially intelligent
  – Can understand written & spoken language (somewhat)
  – Can carry on a conversation
  – Can display competence in a particular area

• Affective
  – Can recognize human emotions
  – Can display appropriate emotion

• Social & relational
  – Can interact in a socially-intelligent manner
  – Can build relationships with human users

• Adaptive
  – Can customize interaction to user’s state & needs

Adapt to Individual & Cultural Differences

• “Surface” adaptations – agent’s ethnicity, demographics, appearance

• “Deep” adaptations – conversational style, ‘politeness’ rules, content

“Hey, R U ok?” vs. “How are you Mrs. Smith?”
State-of-the-Art: Virtual Agents & Robots

- Conversational capabilities
  - Natural language understanding – very difficult!
  - BUT – restricted abilities go a long way

- General competence
  - AI enables agents to display expert behavior – in restricted contexts

- Emotional & social intelligence
  - Some human emotions recognized w/ high accuracy
  - Virtual agents & robots can display some emotions

- Ability to form & maintain long-term relationships
  - We are ‘wired’ to form relationships
  - ‘Relational agents’ being developed

Open Questions & Research Issues

- Is unrestricted natural language interaction necessary?
  - Example: Virtual Mindfulness Coach (Bickmore, Hudlicka)

- Is linguistic understanding necessary?
  - Example: Kismet (Breazeal)

- Is visual realism necessary? Can visual realism be detrimental to interaction?
  - Uncanny valley

- Is affective understanding & realism necessary?
  - Appears to be – but how much?

- Are relationships w/ artificial agents real relationships?
  - What IS a ‘real’ relationship?
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Gaming…

it’s not just for fun anymore

• Most games used for entertainment

• Increasingly, games being used for training & therapy: ‘serious games’

• Serious games (fastest growing segment)
  – Education & Training
  – Exergaming
  – Rehabilitation & therapy
  – Pain reduction in healthcare
  – Coaching (lifestyle & training games)
  – Psychotherapy
Definitions

• Serious affective games
  – Used for training & learning
  – Recognize & adapt to players’ emotions & learning needs
  – Game characters can display emotions
  – Game characters’ appearance & behavior match players’ individual & cultural preferences

Wired to Play

• Can the innate human propensity for play be leveraged to facilitate change & skill acquisition in therapy?
  – Emotional, cognitive, behavioral change
What if….

• Your clients with depression could practice their cognitive restructuring strategies in a gaming context?

• Your child client on the autism spectrum could practice social skills by interacting with game characters?

• Your client with social phobia could attend ‘virtual parties’ & practice approaching strangers & starting conversations?

Examples of Affective Serious Games & Serious Games

• Treating OCD in children (Brezinka)

• Helping children on autism spectrum acquire social & emotion regulation skills (Beaumont)

“Ricky the Spider” (Brezinka) “Secret Agent Society” (Beaumont)
“Ricki the Spider”

- Therapeutic game for children with OCD
- Dr. Veronika Brezinka, Zurich University

Psycho-education about OCD (cognitive model)

- Helps child create a hierarchy of symptoms
- Teaches externalizing methods to cope with anxiety
- Opportunities for exposure & practice of response-prevention
“Secret Agent Society”

- Game for children on the autism spectrum
- Social skills & emotion regulation
- Dr. Renae Beaumont, Social Skills Training

Benefits of Therapeutic Games

- Provide immersive affective experience
- Provide engaging homework
- Games don’t get tired or impatient
- Games are inexpensive
- Games are available 24/7 … anywhere
Summary: Serious Affective Gaming in Clinical Practice

• Promising results to date

• Great potential as affective & gaming technologies advance

• NOT intended to be used w/out therapy & therapist!

• On-going treatment & active participation of therapist essential

• Therapist provides on-going monitoring & instruction, & helps client ‘process’ the game experience

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Examples of VR Treatment Environments

• Emotion regulation “Calm Craft” (Virtually Better)
• PTSD tx with “Virtual Iraq” (Rizzo, USC-ICT)
• Variety of phobias (flying, heights, public speaking)
• Many other disorders (gambling, fibromyalgia)

“Calm Craft”

• Helps children reduce anxiety during medical procedures
• Virtuallybetter.com
“Calm Craft”

• Calming underwater environment

• Child controls submarine movement via deep breathing

• Ability to control breathing translates to other anxiety-provoking situations

Fear of Heights: “Bridges”
“Virtual Iraq/Afghanistan”

- Fully-immersive PTSD treatment environment
- Dr. Skip Rizzo – USC/ICT
- Currently used at over 50 sites

Benefits of Virtual Reality Tx

- Accessible
- Inexpensive (compared to, say, flying)
- Immersive, compelling, engaging for clients
- Customization of environment
- More control over environment to support exposure & desensitization
Summary: VR in Clinical Practice

- Established, evidence-based treatment approach
- VR exposure often as effective as in vivo exposure
- NOT intended to be used w/out therapy & therapist!
- On-going treatment & active participation of therapist essential
- Therapist controls the environment & provides subsequent support

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Telemental Health

- Remote delivery of mental health interventions
- Increasing use because provides improved access
- Current: Videoconferencing / Skype / phone / e-mail
- Future: see previous advanced technologies
  - Most are suitable for remote delivery

States That Reimburse for Telehealth (2012)

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“Take aways” for Clinicians

• Currently available & effectiveness supported by evidence:
  – Virtual reality therapy for a variety anxiety disorders & PTSD
  – Serious games to support CBT therapies
  – Serious games to support learning of social skills & emotion regulation
  – Virtual coaches for training & support for behavior change
  – Virtual agents for training of clinical skills
  – Social robots to support learning of social skills & social interaction
“Take away” for Researchers

• Much work to be done – many open questions
  – How much realism in virtual agents is necessary?
  – Is unrestricted natural language interaction necessary?
  – What are the components of a successful relationship?
  – What can we learn about the ingredients of a good therapeutic alliance?
  – Can serious games be used to augment traditional assessments?
  – What’s the best balance between in-person & technology-mediated treatment?

• Many novel applications as sophisticated technologies become readily available
  – Affective & social agents and robots increasingly capable of intelligent interaction

“Take away” for Administrators & Policy Makers

• Appreciate both benefits & limitations of existing technologies

• Support for research & education & training is essential

• Encourage:
  – Continued development of advanced technologies
  – Education & training of providers
  – Adoption & evaluation of existing technologies

• Advocate for reimbursement for telemental health and other advanced technologies
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Summary: Advanced Technologies in Clinical Practice (1)

- Increasing evidence of success
- Enhance dissemination of evidence-based treatment
- Make treatment more accessible
- Make treatment more customized
- Support treatment between sessions (facilitate homework)
Summary: Advanced Technologies in Clinical Practice (2)

- In some cases, technology may be the preferred method of delivering services (e.g., children with Asperger’s; social anxiety)
- Ability to adapt to individual needs & cultural preferences
- Tremendous potential exists as affective & social computing & agent & robot technologies advance
- BUT – used as an adjunct to in-person therapy,
  • NOT as a substitute