

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

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Outline

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

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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

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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**

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So What Do We Mean by ‘Advanced Technologies’?

- Intelligent
- Adaptive
- Affective
- Social

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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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Agents & Robots



Virtual counselor "Lola" (Lisetti)



Social robot "Kasper" (Dautenhahn)



Relational agent "Laura" (Bickmore)



Virtual patient "Justina" (Rizzo)

... 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)

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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)

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Wired to Connect

- Can the innate human need & ability to connect be used to enhance clinical practice?



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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?

You could learn new clinical skills by interacting with a

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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

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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

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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?”**

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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

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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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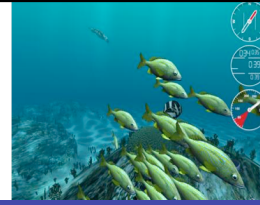
Gaming... it's not just for fun anymore

- 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

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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



FreeDive: Breakaway Games



Virtual Iraq PTSD Rizzo



Secret Agent Society – Beaumont, SST

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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?
- You client with social phobia could attend 'virtual parties' & practice approaching strangers & starting conversations?

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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



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“Ricki the Spider”

- 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

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“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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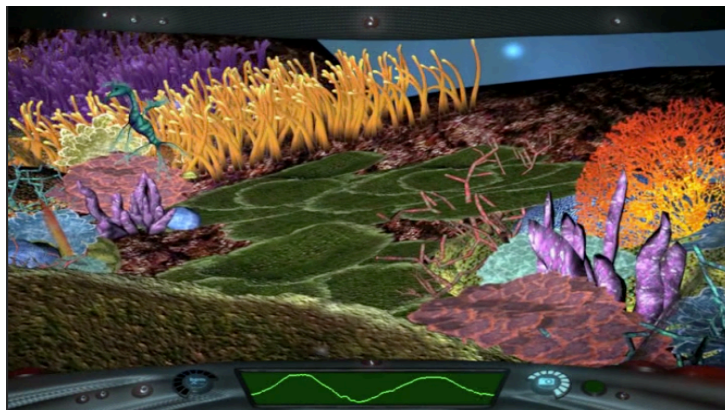
Examples of VR Treatment Environments

- 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)

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“Calm Craft”

- Helps children reduce anxiety during medical procedures
- Virtuallybetter.com



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“Calm Craft”

- Calming underwater environment
- Child controls submarine movement via deep breathing
- Ability to control breathing translates to other anxiety-provoking situations

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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

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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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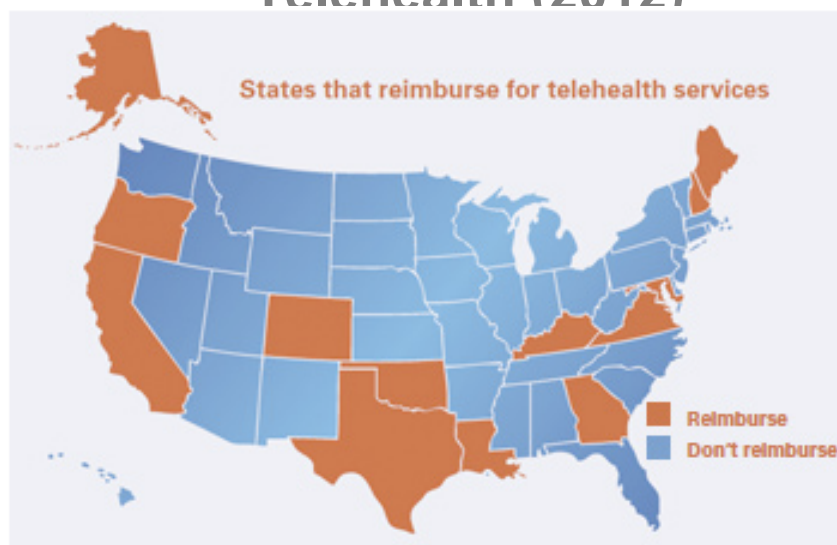
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Telemental Health

- 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

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States That Reimburse for Telehealth (2012)



<http://www.apa.org/monitor/2012/07-08/telehealth.aspx>

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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

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“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

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“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)

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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

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