Virtual Reality Job Interview Training and Employment Outcomes
Adults with Severe Mental Illness

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Disclosures

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Talk Outline

1. Employment for individuals with severe mental illness
2. Job interview as barrier to employment
3. Available interview training
4. Virtual Reality Interventions
5. Virtual Reality Job Interview Training (VR-JIT)
6. Randomized Controlled Trials of VR-JIT
Employment for Individuals with Severe Mental Illness

• Severe Mental Illness (SMI) – bipolar disorder, major depressive disorder, schizophrenia as well as Veterans with PTSD

Luciano et al., 2014; Zivin et al., 2011
Interviewing as barrier to employment

• Most proximal factor to finding a job for clients receiving services

• Several factors contribute to poor interviewing

• Stakeholders (e.g., consumers, employers) suggest interviewing is a critical barrier to employment (Marwaha et al., 2006)
Available Interview Training

• Most programs rely on clinician-facilitated role-play training

• Minimal evidence that this method is effective, but it is widely used

• 10 Year-follow-up study indicated that only 30% of clients receiving standardized vocational services reported that role-playing with a counselor was helpful

• Novel evidence-based interventions are needed to fill this gap in services
Virtual Reality Job Interview Training (VR-JIT)

- NIMH funded
- Developed for Individuals with psychiatric disorders
Virtual Reality Interventions

• Has demonstrated efficacy at:
  -Teaching FBI agents to interrogate suspects
  -Teaching physicians to talk to patients about drug abuse
  -Teaching social skills to neuropsychiatric populations

• Why does VR appear to help?
  -Behavioral learning principles
    -Hierarchical learning (easy-to-medium-to-hard)
    -Repeated practice (drill-and-repeat)
    -Reward conditioning and feedback (makes practice enjoyable)
VR-JIT Design Feature Outline

- Virtual HR interviewer developed with matrix that generates 9 characters that can evolve based on trainee response
- Individually customizable
- Core features for clinical populations
- Hierarchical learning
- Web-based didactics
- Automated feedback
Virtual HR Interviewer
Molly Porter

• 1000+ statements/questions recorded by Actress

• Example Interview Questions:
  “What is your greatest strength?”
  “I see there are gaps in your work history, can you tell me more about that?”

• Trainees speak from 5-15 statements & questions

• Example Trainee Responses:
  “I’m good at pretty much everything I do.”
  “This is my first job out of school.”
VR-JIT Interface

Follow-on

A good boss would be a strong leader who helps everyone feel like they are on the same team and are working toward a common goal.

I think it's important that bosses are easy to talk to—like a friend at work.

I don't know. I've never really thought about what makes a boss good.

I'd love a boss who is a lot of fun and lets us play jokes and stuff at work.

Someone who gives direction as needed, but trusts his or her employees enough to let them handle things.

Someone who is really forgiving of mistakes, no matter how many I make.

The best leaders I've known are really good at dividing up tasks so that everyone is doing something he or she does well.

Someone who is easy to talk to and is approachable.

The best bosses trust and respect their employees.

Patience and understanding is really important in a boss.

Ask for Thursdays off

Can I get Thursdays off? I have an important appointment I can't miss.

I need Thursday afternoons off. Can you do that?

I have a standing obligation on Thursday afternoons. Could that be accommodated into my schedule?
Individually Customizable

Job application informs the interview questions
Core Features for Clinical Populations

- Asking for accommodations
- Negotiating scheduled time off
- Discussing gaps in work history
- Discussing prior conviction
- Discussing applicability of military training to community job
- Recognizing and handling illegal questions
- Disclosing one’s diagnosis
Hierarchical Learning

Friendly Molly

Business Molly
Educational Curriculum

- Trainees are provided web-based content on interview basics
Automated Feedback

• Real-time feedback from non-verbal job coach
Scripted Feedback

• After each simulated interview, trainees receive color coded in a transcript to identify whether responses were helpful or hurtful to rapport with Molly (or were neutral)

• Responses can be played back so trainees can hear how they sound.
"Hello, my name's Molly. We spoke on the phone. I'm glad you could come in today."
First impressions matter, so be sure to return Molly's greeting in a polite and friendly manner.

"Hello, Molly. It's nice to meet you."
This is a polite greeting.

"Did you have any trouble finding the place today?"
Molly is trying to make friendly conversation and help you relax.

"Yes. I was almost late."
This makes you look like you did not prepare well.

"Where do you see yourself in ten years?"
Molly wants to know more about your plan for your life. You look like you are organized and driven when you have goals, which could mean you are a better worker.

"I'd like a job I'm content with."
This is a decent answer, but could be improved by more detail about what sort of job would make you content.
How does VR-JIT compare to current methods?

<table>
<thead>
<tr>
<th>Behavioral Learning Principles</th>
<th>VR</th>
<th>SE</th>
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</thead>
<tbody>
<tr>
<td>Hierarchical learning</td>
<td>X</td>
<td>-</td>
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<tr>
<td>Repetitive practice</td>
<td>X</td>
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<tr>
<td>Systematic desensitization</td>
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<th>Role-Plays</th>
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<tbody>
<tr>
<td>Nonverbal job coach</td>
<td>X</td>
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<tr>
<td>Automated feedback on each response</td>
<td>X</td>
<td>-</td>
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<tr>
<td>Audio record and transcript to review</td>
<td>X</td>
<td>-</td>
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<tr>
<td>Desensitization without prior rapport</td>
<td>X</td>
<td>-</td>
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<tr>
<td>Customizable based on client needs</td>
<td>X</td>
<td>NS</td>
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<tr>
<td>Multiple personalities for Interviewer</td>
<td>X</td>
<td>NS</td>
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<tr>
<td>Various moods for interviewer</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rehearse responses</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Develop questions for employer</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Discussing strengths/limitations</td>
<td>X</td>
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Note. X=Present, - =Absent; NS=Not standardized (Training is not evidence-based standard, but some staff may use unstandardized method).
Who’s ready to talk to Molly?
Great, so we developed this novel intervention that should work in theory… What’s next?
Research Results

We’ve evaluated Molly in 5 different groups of consumers and see similar effects in each group:

* Schizophrenia
* Mood Disorders
* Military Veterans with PTSD (and mood disorders)
* Autism Spectrum Disorder
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<th>Study Procedures</th>
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<td><strong>SBIR Grant</strong></td>
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<td>Pre-Test</td>
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<td>Cognition</td>
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<td>Interviewing</td>
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<td>Self-Confidence</td>
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<td>Employment history</td>
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<tr>
<td>2 Pre-Test Role-Plays</td>
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<td></td>
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<tr>
<td><strong>VR-JIT Trainees</strong></td>
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<tr>
<td>2-Week Training</td>
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<tr>
<td>5 sessions of VR-JIT,</td>
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<td>Up to 2 hours per session,</td>
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<td>20-30 min per virtual interview</td>
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<td><strong>Waitlist TAU Participants</strong></td>
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<td>Post-Test</td>
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Study Procedures

- Process Measures
  - VR-JIT scores each virtual interview 0-100
  - scores monitored by SIMmersion and recorded by staff

- Acceptability measures
  - Monitored # of completed trials, session attendance, time using system, self-reported experience using VR-JIT
Results

- No differences between trainees/non-trainees in:
  - Cognition
  - Prior vocational training
  - Prior paid employment
  - Months since last job

- All groups:
  - completed >90% of training sessions
  - completed >500 out of 600 minutes of training
  - completed >14 virtual interviews
  - >90% agreed or strongly agreed that VR-JIT was enjoyable, helpful, and instilled them with confidence.
Results

- Process Measures

  Did trainees improve their performance across trials while increasing difficulty from easy to medium to hard?
Results

- Adults with Schizophrenia

Smith et al., 2015
Results

• Adults with Mood Disorders

Smith et al., 2014a
Results

- Veterans with PTSD

![Graph showing average VR-JIT score over job training trial number and difficulty]

Smith et al., 2015
Results

- Young adults with ASD

Smith et al., 2014b
Results

• Individuals with Schizophrenia

Smith et al., 2015
Results

- Individuals with Mood Disorders

Smith et al., 2014a
Results

• Veterans with PTSD

Smith et al., 2015
Results

• Young Adults with Autism Spectrum Disorders

Smith et al., 2014b
Employment Outcome Data

Rate of Job Offers for SMI and ASD Cohorts at 6-Month Follow-up

SMI Cohort

- Controls: 25%
- VR-JIT Trainees: 51%

ASD Cohort

- Controls: 25%
- VR-JIT Trainees: 53%
Overview of Findings

• Molly training is associated with:
  - improved skills as mechanism
  - higher rate of job offers
  - high rate of acceptability

Northwestern study: Job-interview simulator works well for veterans

By John Carpenter
Blue Sky

July 1, 2015, 5:30 AM

Job interviews can be daunting challenges for veterans suffering from post traumatic stress disorder. Even a closed office door can be a trigger.

But research at Northwestern University’s Feinberg School of Medicine, published Wednesday in the journal Psychiatric Services, found that a virtual reality interview simulator significantly increases a military veteran’s chance
Currently Funded Studies of Molly

- NIMH
  - Community Effectiveness (Does training work in a community setting?)
    - Improved skills
    - Higher employment rate
    - Get jobs faster
  - Initial Implementation Evaluation (Are we delivering the training with an optimal method?)
  - Cost Effectiveness (Is it cheaper to do usual care or use Molly?)
Thank you for your Attention!
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