Visual Support Strategies to Teach Recreation and Leisure Skills to Adults with Developmental Disabilities

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Recreation: Refreshment from weariness; pleasurable interest; amusement
Leisure: Freedom from occupation; spare time; unoccupied time
Introduction

• Leisure activities are important because of the positive, beneficial effects on social skills, communication abilities, and overall quality of life (Felce & Perry, 1995, Garzia-Villamisar & Dattilo, 2011)

• Adults with disabilities have few options or opportunities for recreation and leisure activities
  – On a typical weekend, less than 4 hours spent on leisure activities, although as many as 19 hours were available (Zijlstra & Vlaskamp, 2005)
Introduction

• Opportunities are often limited based on environmental barriers, such as involvement of other people, availability of transportation, and accessibility of the activities (Badia et al., 2011)

• Challenges due to lack of educational opportunities to learn new leisure activities
Previous Literature

• Video prompting to teach adults picture taking & printing (Edrisinha, O’Reilly, Choi, Sigafoos, & Lancioni, 2011)
• Activity schedule to teach young children to turn on video game console; video modeling to use controller (Blum-Dimaya et al., 2010)
• Video modeling to teach HS students to use iPod Nanos (Hammond, Whatley, Ayres, and Gast, 2010)
• Video modeling to teach HS students to use iPod Touches (Kagohara et al., 2011)
Teaching Leisure Skills to an Adult with Developmental Disabilities Using a Video Prompting Intervention Package

Chan, Lambdin, Van Laarhoven, & Johnson (2013)

*Education and Training in Autism and Developmental Disabilities*
<table>
<thead>
<tr>
<th>Name</th>
<th>Age (years)</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marvin</td>
<td>35</td>
<td>Moderate Intellectual Disability, Down Syndrome, Type II Diabetes</td>
</tr>
</tbody>
</table>

- Day program 4 days/week, sheltered workshop 1 day/week
- Very outgoing
- 2-3 word sentences
- Limited self-help skills
## Task Analyses

**Painting**
1. Put on apron
2. Get newspaper
3. Get paper towel and paintbrush
4. Get cup of water
5. Get paint and paper
6. Paint picture
7. Put painting on drying table
8. Put materials in sink
9. Throw away paper towel and recycle
10. newspaper
11. Wash hands
12. Hang up apron

**Listening to Music**
1. Put on headphones
2. Unlock iPod (push home button and slide icon)
3. Tap “Music” icon
4. Find album and tap icon
5. Tap song
6. Tap “Pause” icon when done
7. Close app (push home button)
8. Take off headphones

**Taking Pictures**
1. Unlock iPod (push home button and slide icon)
2. Tap “Camera” icon
3. Take pictures
4. Close app (push home button)
5. Tap “Photo” icon
6. Tap “Camera Roll”
7. Tap the picture you want to look at
8. Swipe through pictures to browse
9. Close app (push home button)
Materials & Setting

- Video Prompting
  - 3rd generation iPod Touch
  - Picture Scheduler app
- Participant’s iPod
  - 4th generation iPod Touch
- Day program for adults with disabilities
  - Painting: art room
  - Music: private room
  - Taking Pictures: private room (protect privacy of other clients + seasonal weather)
Tasks

- Put on apron
  - April 26, 2011
  - 3:13:34 PM

- Newspaper
  - March 3, 2011
  - 12:29:07 PM

- Paper towel & brush
  - March 3, 2011
  - 12:32:58 PM

- Cup of water
  - March 3, 2011
  - 12:43:23 PM

- Paint and paper
  - October 3, 2011
  - 3:12:21 PM

Paint your picture
  - March 3, 2011
Procedure

• Baseline
  – Given 5 s to complete each step
  – Correct: continue
  – Incorrect: instructor completed step

• Intervention
  – Watched video of step
  – Given 5 s to complete each step
  – Correct: continue
  – Incorrect/nonresponsive: least-to-most prompting (verbal, point, physical)
IOA & Treatment Fidelity

- Inter-observer Agreement
  - 50% of sessions
  - 100% across all behaviors
- Treatment Fidelity
  - 46% of sessions
  - 100%
• During LTM, verbal and point prompts were usually sufficient

• Even though Marvin required LTM prompting, current intervention was more time efficient (vs. arranging and cleaning up extra materials used by a model, for instance)

• LTM not faded entirely

• No formal social validity measure, but Marvin frequently smiled and laughed; he also liked browsing old pics from previous sessions
A Picture-Based Activity Schedule Intervention to Teach Adults with Mild Intellectual Disability to Use an iPad During a Leisure Activity

Chan, Lambdin, Graham, Fragale, & Davis (2014)
Journal of Behavioral Education
## Participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Age (years)</th>
<th>IQ</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ron</td>
<td>51</td>
<td>65</td>
<td>ID, epilepsy, schizoaffective disorder, hypertension, glaucoma, gastroesophageal reflux disease</td>
</tr>
<tr>
<td>Jackie</td>
<td>57</td>
<td>66</td>
<td>ID, depressive disorder, alcohol dependence</td>
</tr>
<tr>
<td>Kirk</td>
<td>33</td>
<td>64</td>
<td>ID, schizoaffective disorder, bipolar disorder</td>
</tr>
</tbody>
</table>
Materials

• 3rd generation iPad (iOS 5)
• Free version of Angry Birds
  – Icon in dock
• Activity schedule: 8.5 x 11 in paper
Setting

• Private room at sheltered workshop
• Sessions conducted during regularly scheduled breaks
Target Behavior

1. Open cover and stand
2. Unlock iPad
3. Tap Angry Birds icon
4. Tap “Play” button
5. Choose level to play
6. Play all birds
7. Play again by tapping “replay” (played for 5 min)
8. Push home button to close game
9. Close cover
Target Behavior

• Correct: Completes step with or without referring to activity schedule within 10 s of previous step
• Incorrect: No attempt within 10 s or wrong behavior completed (e.g., wrong icon tapped)
<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlock</td>
<td>Game 1</td>
<td>Game 2</td>
</tr>
<tr>
<td>Activity</td>
<td>Activity</td>
<td>Activity</td>
</tr>
</tbody>
</table>
Procedure

• Session starts with iPad, with cover closed, placed on table

• Baseline
  – Instructed to play game
  – No physical prompts, guidance, or reinforcement
  – If participant made an error, step was completed out of view
Procedure

• Intervention
  – Unrestricted access to activity schedule
  – If participant was non-responsive: verbal prompt to check activity schedule, faded to point prompt (Ron & Jackie)

• Maintenance
  – Same as baseline
IOA and Treatment Fidelity

• Inter-observer Agreement
  – Collected during 39% of sessions
  – 99% (Range = 89-100%)

• Treatment Fidelity
  – Collected during 41% of sessions
  – 100%
Discussion Points

• Ron had difficulty folding the case into a stand

• Jackie frequently asked to use the iPad even though it was not available; participants showed enjoyment

• Learning during baseline
  – Saw instructor perform steps?
  – User-friendly interface + trial and error?
Study 3

Video Modeling Intervention to Teach Adults with Multiple Disabilities to Play Fruit Ninja on an Android Tablet

Chan & Walus (in preparation)
<table>
<thead>
<tr>
<th>Name</th>
<th>Age (years)</th>
<th>IQ</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mikey</td>
<td>63</td>
<td>69</td>
<td>ID, hard of hearing, diabetes, used manual wheelchair</td>
</tr>
<tr>
<td>Kath</td>
<td>47</td>
<td>71</td>
<td>ID, cerebral palsy, dysarthria, seizure disorder, used electric wheelchair, some gestures, AAC, some sign language</td>
</tr>
<tr>
<td>Floyd</td>
<td>50</td>
<td>52</td>
<td>ID, cerebral palsy, spastic diplegia, strabismus, spoke in complete sentences, used manual wheelchair</td>
</tr>
</tbody>
</table>
Materials and Setting

- Google Nexus (1st generation) with 7-inch screen
- Android 4.4
- Windows laptop for viewing video model
  - Video posted on YouTube
- Classroom at day treatment program for adults with disabilities
- Participants sat at table with tablet in upright position or with tablet in lap (Kath only)
Dependent Variable: Fruit Ninja

• Score in Classic Game mode
  – Game continues until three fruit fall off screen w/o being sliced or bomb is sliced
  – Baseline: 1 game per session
  – Intervention and Maintenance: 5 games per session (reported average score)
1. Unlock the tablet by entering passcode
2. Tap the Fruit Ninja icon
3. Slice “New Game” Watermelon
4. Slice “Classic” Watermelon
5. Slice “Play Game” Watermelon
6. Play game
7. Slice “Continue” Watermelon (and tap red X to dismiss ad, if necessary)
8. Dismiss any pop-ups
9. Swipe down from top of screen and tap the “House” icon to return to home screen
Procedure

- **Baseline**
  - Verbal SD’s of tablet navigation steps
  - No physical prompts or reinforcement
  - If participant made an error, step was completed out of view (tablet navigation only)

- **Intervention**
  - Fruit Ninja: Video model with narration
    - Watched video at beginning of session
  - Tablet Navigation: Hand-over-hand prompts as needed
IOA & Treatment Fidelity

• Interobserver Agreement
  – 40% of sessions
  – Tablet Navigation: 96% (range = 87.5% - 100%)
  – Fruit Ninja Scores: 100%

• Treatment Fidelity
  – 40% of sessions
  – 100%
Fruit Ninja Scores

Average Score Per Session

Sessions

Baseline Intervention Maintenance

Mikey

Kath

Floyd
Tablet Navigation

Baseline - Intervention - Maintenance

Mikey, Kath, Floyd

Percentage of Steps Correct - Sessions
Social Validity

• 5-point Likert (1=strongly disagree, 5=strongly agree)

• Participants (n=2)
  – Importance, appropriate time requirement, improvement, fun
  – Mean = 4.8

• Implementer
  – Importance, effectiveness, ease of implementation, time requirement
  – Mean = 5.0
Discussion Points

• Small screen size
• Appropriate amount of force & length of touch
  – Touch did not register accurately
  – Tablet stand not stable
    • Sometimes slid or collapsed
    • Used non-slip material at base of tablet
• Fingernail prevented successful touch
• Position of hand interfered with view of screen
Thoughts

• Are visual supports the most efficient way to teach an individual to use a tablet or play games?
  – Dose

• Don’t underestimate adults’ ability to use technology, particularly if they have limited range of motion or vision problems

• Advantages of Android over iOS?
  – Tradeoff between cost and future-proofness

• Frustration: “Updates” to user interface, apps
Thoughts

• Can/should we rely on commercially-available apps for intervention?
  – Availability limited to iOS
  – Infrequent updates
  – Lack of support
Targeting Recreation & Leisure
Future Directions

• Continue research into leisure skill instruction for adults with disabilities

• Other operating systems besides iOS (Windows, Android)
  – General case programming approach

• Emerging computing devices and environments (Alexa, Google Glass, virtual reality, augmented reality) for functional, vocational, and academic skills