



Patient Application User's Manual

CAUTION: FEDERAL LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PHYSICIAN.

IMPORTANT: READ THE SAEBOVR GETTING STARTED GUIDE (BAI-VOTA-LBL-001) IN ITS ENTIRETY BEFORE USING THE SAEBOVR SOFTWARE SYSTEM.

The information in this document is verified as of June 10, 2017.

© 2017 Virtual Therapy Solutions, LLC ALL RIGHTS RESERVED

Product designation: SaeboVR-1



Table of Contents

1	Summary	4
2	Overview	4
2.1	Software Organization.....	4
2.2	User Account Creation and Login.....	5
2.3	Player Dashboard	5
2.3.1	Menu	6
2.3.2	Settings Options.....	7
2.3.3	Avatar Selection	8
2.4	Rewards.....	8
2.4.1	Gold Coins	8
2.4.2	Badges.....	8
3	Player Interactions	9
3.1	Kinect Tracking-based Interactions	9
3.1.1	Interactions with Virtual Objects.....	9
3.1.2	Using the Laser Pointer to Select Locations and Navigate	11
3.1.3	Cart Navigation.....	12
3.1.4	Point-and-Spray Interactions	12
3.2	Mouse Interactions	12
4	Difficulty settings.....	13
4.1	Cognitive Difficulty	13
4.2	Motor Difficulty	13
4.3	Guidance for Setting Difficulty Levels	14
4.3.1	Motor Difficulty Setting	14
4.3.2	Cognitive Difficulty Setting.....	14
5	Activity Descriptions	15
5.1	Balls and Boxes.....	15
5.2	Grocery Shopping	16
5.2.1	Motor Difficulty.....	17
5.2.2	Cognitive Difficulty	17
5.3	Putting Away Groceries	17
5.3.1	Motor Difficulty.....	18
5.3.2	Cognitive Difficulty	18
5.4	Preparing Breakfast.....	19
5.4.1	Motor Difficulty.....	19
5.4.2	Cognitive Difficulty	19
5.5	Pet Shopping	19
5.5.1	Motor Difficulty.....	20
5.5.2	Cognitive Difficulty	21
5.6	Pet Feeding.....	21
5.6.1	Motor Difficulty.....	22
5.6.2	Cognitive Difficulty	22
5.7	Pet Bathing	22
5.7.1	Motor Difficulty.....	23
5.7.2	Cognitive Difficulty	23

5.8	Garden Planting.....	23
5.8.1	Motor Difficulty.....	24
5.8.2	Cognitive Difficulty	24
5.9	Garden Harvest.....	24
5.9.1	Motor Difficulty.....	25
5.9.2	Cognitive Difficulty	26
5.10	Preparing Dinner.....	26
5.10.1	Motor Difficulty.....	26
5.10.2	Cognitive Difficulty	27
5.11	Organizing Closet	27
5.11.1	Motor Difficulty.....	28
5.11.2	Cognitive Difficulty	28
5.12	Soup Kitchen Volunteering	28
5.12.1	Motor Difficulty.....	29
5.12.2	Cognitive Difficulty	29
6	Hotkeys	30
7	Copyright	30
8	Customer Support	30

1 Summary

SaeboVR is virtual world-based rehabilitation software that enables functional practice of activities of daily living through a standard personal computer and an off-the-shelf motion-tracking sensor. This Software User's Manual provides details on the organization and usage of the SaeboVR patient-facing software. It is a companion document to the *SaeboVR Getting Started Guide*, which should be read in its entirety before using the system. For information on accessing patient participation, activity, and motor performance metrics, see the *SaeboVR Provider Dashboard User's Manual*.

2 Overview

2.1 Software Organization

SaeboVR is organized around four islands on which the player practices activities of daily living as they progress along a virtual Road to Recovery. Each of the islands has a unifying theme around which the activities are based.

- Island 1 is *Fun With Food* with activities for:
 - Grocery Shopping;
 - Putting Away Groceries; and
 - Preparing Breakfast.
- Island 2 is *Puppy Playtime* with activities for:
 - Pet Shopping;
 - Pet Feeding; and
 - Pet Bathing.
- Island 3 is *Garden Bounty* with activities for:
 - Garden Planting;
 - Garden Harvesting; and
 - Preparing Dinner.
- Island 4 is the *Home Stretch* with activities for:
 - Organizing a Closet and
 - Soup Kitchen Volunteering.

The activities, represented as “lily pads” along the Road to Recovery, are typically done in sequence, and then repeated a total of four times before “graduating” to the next island. Additionally, a Balls and Boxes exercise is performed at the beginning of the Road to Recovery, providing an opportunity for practice and also generating a performance baseline that can be used to monitor the player's progress along the road. After each of the island's activities have been accomplished four times, the player performs Balls and Boxes once again before graduating to the next island.

2.2 User Account Creation and Login

Upon program launch, SaeboVR brings up a login window. The user can either enter a user name for an existing account, or create a new user account. When a valid user name is entered, the Login button becomes active (Figure 1).

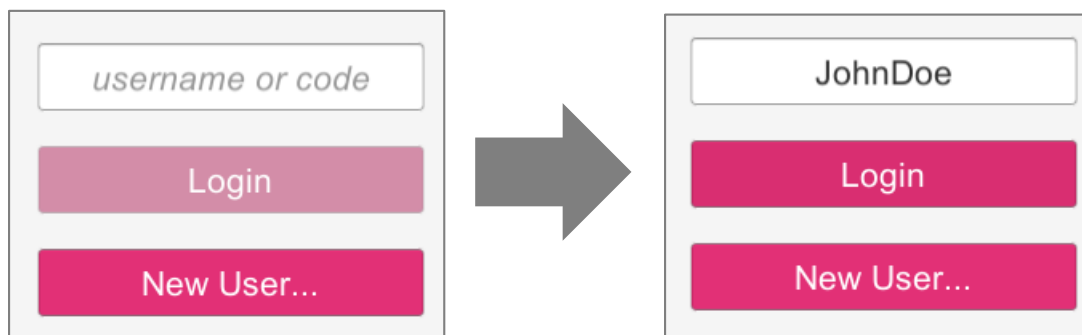
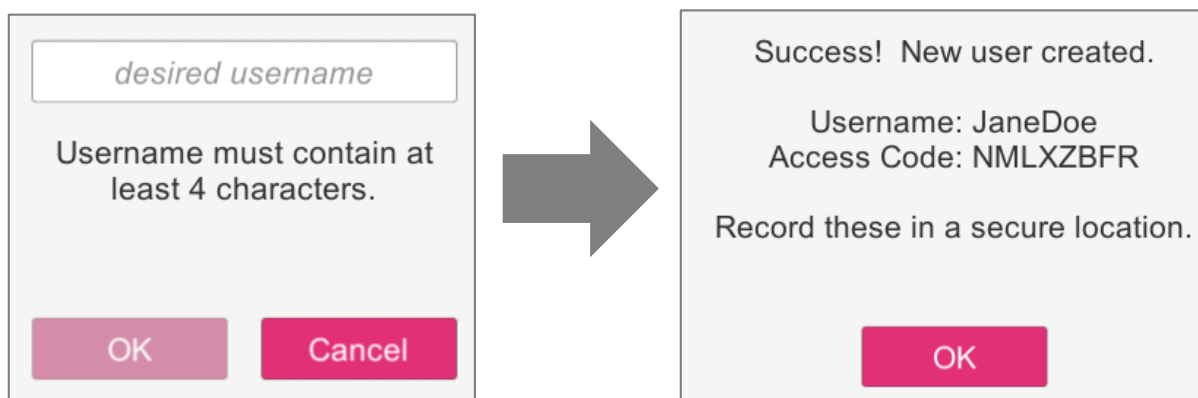


Figure 1. Login Window

Clicking on New User results in the user being queued to enter a user name for a new account. Once a valid user name is provided, the OK button becomes active. On creation of the new account, SaeboVR provides an 8-character access code. Both the user name and access code should be recorded in a secure location where it can be retrieved if either is forgotten. Either of these can be used during subsequent logins to retrieve the patient's data.



2.3 Player Dashboard

After successful login, the user arrives at the Player Dashboard. This is the primary user interface for SaeboVR and allows players to:

- Access the activities on each island
- Navigate between islands
- See their progress along the Road to Recovery
- A display of the total coins earned and special badges awarded for exceptional performance
- A START button to launch the selected activity.

- A MENU button to access additional game features and settings.



Figure 2. SaeboVR Player Dashboard

The player dashboard automatically advances the player along the road as each activity is completed. To continue to the next activity, the player just clicks the “START” button on the lower right corner of the screen. Note that the next activity to be performed is shown in text in the same box as the start button.

Although a sequential progression down the Road to Recovery is generally preferred, the user may bypass a linear progression and directly go to any activity. It is possible to access any of the four islands by clicking on the graphic on the far left of the player dashboard. Individual lily pads can be activated simply by clicking on them. The active lily pad has a glow effect and the corresponding activity is shown in text within the start button.

2.3.1 Menu

Clicking on the MENU button brings up a set of additional choices (see Figure 3). These include:

- **Play Intro** – Play the animated introduction to the virtual world.
- **Practice** – Entering into a “free play” practice activity that can be used to orient a patient to using arm motions to interact with virtual objects. This practice activity is identical to the Balls and Boxes exercise described in Section 5.1 below, but with no time limit.
- **Badges** – Bring up a complete display of all badges for cumulative rewards earned.
- **Settings** – Opening up a Settings dialog to customize the SaeboVR experience.
- **Avatar Selection** – Go to the avatar selection view.
- **About** – Display information about the SaeboVR software.
- **Quit** – Exit the game.



Figure 3. MENU Options

2.3.2 Settings Options

The Settings dialog (see Figure 4) provides the following options:

- **Cognitive Difficulty** – Choose the cognitive difficulty level for the game. See section 4.1 for a description of how this setting impacts each activity.
- **Motor Difficulty** – Choose the motor difficulty level for the game. See section 4.2 for a description of how this setting impacts each activity.
- **Easy Interactions** – Determines the level of precision required for accomplishing object interactions. Default is “Yes” (Easy). Choosing “No” requires the user to pause the hand over an object to pick it up.
- **Auto Complete** – Default is “No” (no time limit on task completion). Selecting “Yes” results in tasks self-completing after a set time.
- **Impaired Arm** – Choose which arm the patient will be using.

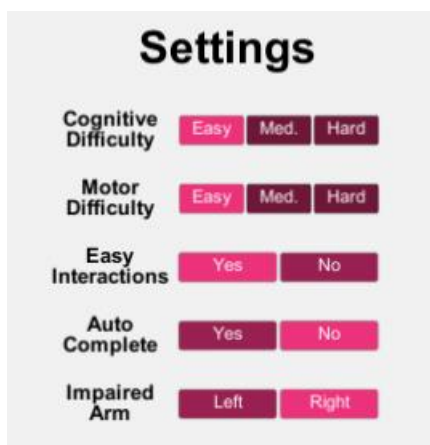


Figure 4. Settings Dialog

2.3.3 Avatar Selection

The Avatar Selection view enables the user to select from 16 different virtual characters to represent him/herself within the virtual world. The user can return to this view via the MENU to change the selection at any time. Note also that this Avatar Selection view also enables the user to choose or change the breed of puppy the will accompany him/her in many of the activities (see Figure 5).

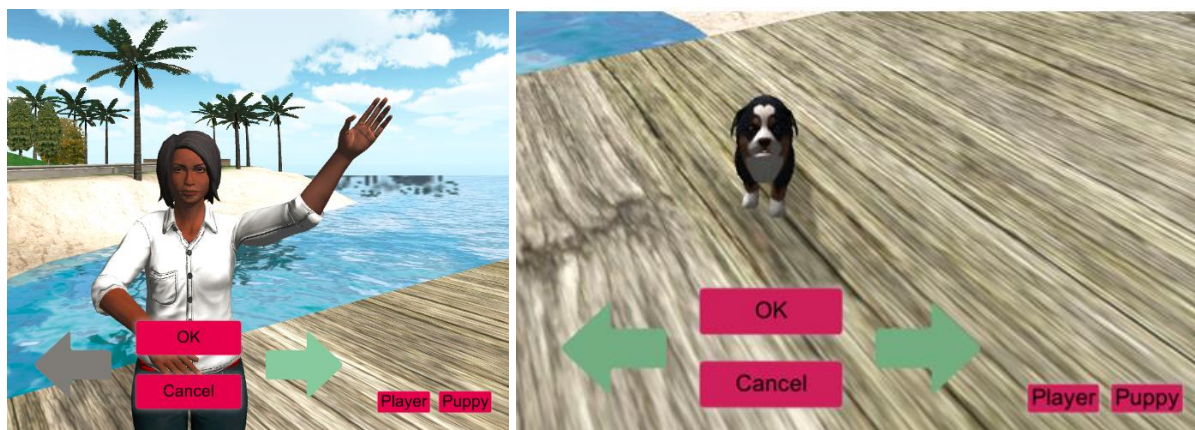


Figure 5. Avatar Selection

2.4 Rewards

2.4.1 Gold Coins

Players earn and accumulate gold coins for completing tasks within game activities: for example, a player earns coins by selecting the correct item from a grocery store shelf. In most cases, the number of gold coins awarded is dependent on the speed of task completion. If the player completes a task before a visual cue appears (a green arrow pointing at the correct object), they are awarded the maximum number of gold coins (typically 10). If the task is completed after the visual cue but before an audio cue plays (indicating what action to take), the player is awarded a reduced number of coins. After the verbal cue, no coins are awarded for that particular task.

Upon completion of an activity, the total number of gold coins earned is displayed in a wrap-up window. This total is added to a cumulative total (over all activities and all sessions under the same login name) displayed in the upper-right corner of the Player Dashboard (Figure 2). Whenever the player achieves a Personal Record (PR, high score in that activity), they are awarded a Gold Star, which is one of a number of badges that a player can earn.

2.4.2 Badges

Badges are awarded as recognition for special achievements in the game. When a player earns one or more badges, an additional pop-up window appears after the activity presenting the awards. The different badges that can be earned are:

Gold Star	Earned for each PR (record score) in any activity
Record Breaker	Earned for two consecutive PR's in any activity
Super Record Breaker	Earned for three consecutive PR's in any activity
Master	Awarded for completing an activity four times

The presentation of a badge is accompanied by an additional “bonus” award of gold coins.

The total number of Gold Stars earned across all sessions is always shown on the upper-right corner of the Player Dashboard (next to the gold coins total, see Figure 6).

Most-recently earned badges are shown on the upper-right corner of the Player Dashboard just below the gold coins and Gold Star total.

Note that ties (earning same number of coins as previous record) are counted as PR's.



Figure 6. Gold Coin Total and Badge Display on Upper-Right Corner of Player Dashboard

3 Player Interactions

SaeboVR is operated using a Microsoft Kinect sensor as well as a standard mouse and keyboard (typically an all-in-one wireless mouse-keyboard combination).

3.1 Kinect Tracking-based Interactions

If you encounter problems with player tracking using the Kinect, please follow the steps outlined in the TROUBLESHOOTING section of the *SaeboVR Getting Started Guide*.

The primary means by which the player interacts with SaeboVR is through natural upper extremity (arm) movements, typically involving the impaired arm. Using the Kinect, SaeboVR tracks the player's arm and animates the player's avatar to mimic real world arm pose. Although SaeboVR does not track the player's hand motion, users are encouraged to employ their hand during virtual interactions.

Though the Kinect tracks the user's entire body, including both arms, only the left or right arm selected in the Avatar Selection view (see Figure 5) will be seen and be active during an activity. The only activity in which the opposite arm is also used is Balls and Boxes (see below). The only time a player will see both arms tracked by the Kinect is in the Avatar Selection view.

Note that the player's trunk movements are not translated to the avatar. Thus leaning forward to extend one's reach will yield no result in the virtual world. This is by-design, to discourage undesired compensatory movements.

3.1.1 Interactions with Virtual Objects

During SaeboVR activities, players are typically asked to use their selected arm to interact with virtual objects, such as selecting or picking up items and moving those items to new locations. To pick up an object, a player simply reaches for it. After the avatar's hand grasps the item, the object

will automatically be held until placed into a cart (Figure 7). Placing the object works in a similar manner. The player simply moves it to the desired location and it will be released. Other virtual objects, such as a cabinet door or stove knob, are similarly activated by the touch of the player avatar's hand.



Figure 7. Grocery Item Held in Player Avatar's Hand

Note that on occasion, players may have difficulty with the lack of depth perception in the virtual world. As a result, their reach may be too close or too far to trigger the desired interaction. When reaching too far, the player's hand can disappear into virtual objects (e.g. a wall). To assist the player with virtual depth perception, SaeboVR implements a "wall vision" effect in which the avatar's hand becomes blue to show that it has penetrated a virtual object (Figure 8). Players can typically use this as a cue to see that they have overreached.



Figure 8. Wall Vision Effect Showing that the Avatar's Hand Has Overreached into a Virtual Object

3.1.2 Using the Laser Pointer to Select Locations and Navigate

In some activities, the player is asked to point to the location they wish to go to. This is accomplished via a “laser pointer” which extends from the player’s arm to a point in the virtual world. When a target area is illuminated by the laser pointer for a period of time, the player automatically moves to the selected location (see Figure 9 and Figure 10).

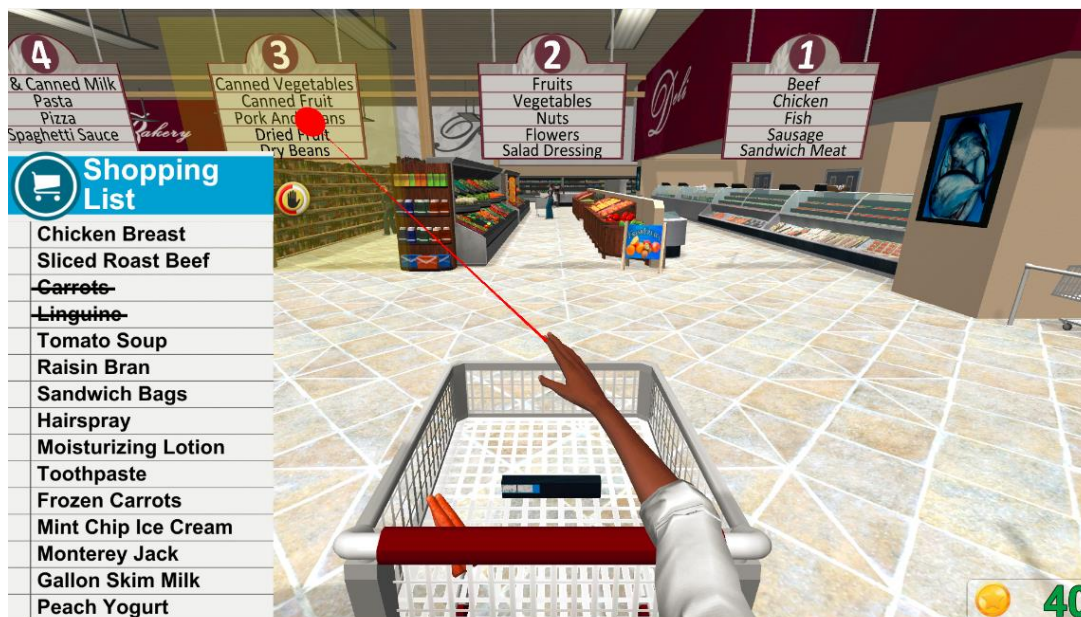


Figure 9. Selecting a Grocery Store Aisle Using the Laser Pointer



Figure 10. Selecting a Location to Put Away Groceries Using the Laser Pointer

This technique is used to enable the player to choose aisles while grocery or pet shopping, to choose where different grocery items belong in the house, to select where to plant in the garden, to select which plant to harvest vegetables from, and to choose which puppy to adopt.

3.1.3 Cart Navigation

In shopping activities, the player has the ability to navigate from side-to-side while pushing a cart. This interaction is enabled using the same laser pointer. To move left or right, the player simply points to a region on the lower-left or lower-right corner of the screen. The left or right movement is activated while the laser dot is in the yellow box (see Figure 11).

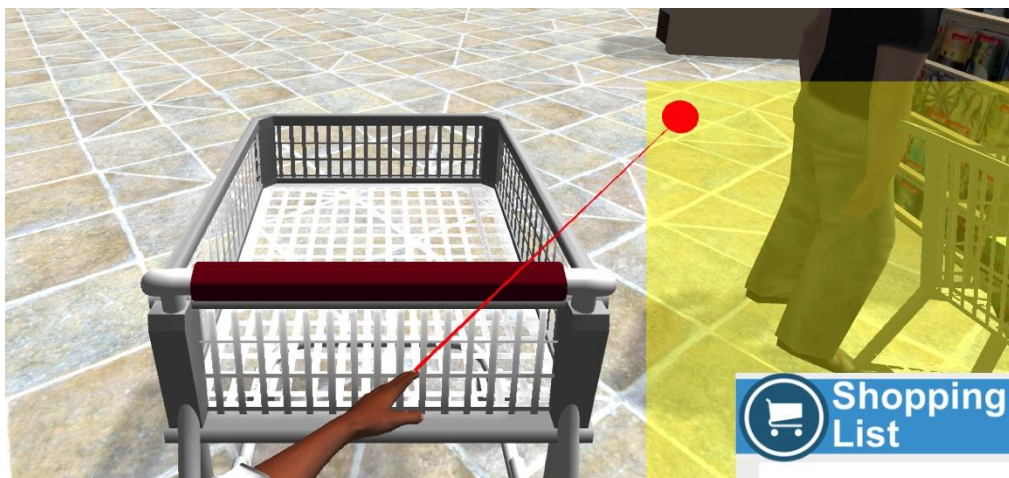


Figure 11. Cart Navigation Using Laser Pointer

3.1.4 Point-and-Spray Interactions

A number of other special interactions are enabled at times during SaeboVR activities. These include: using a shower nozzle to rinse bubbles off a puppy, using a garden hose to water plants, using a hair dryer to dry off the puppy after bathing. These sequential actions are designed to be intuitive to the player. For example, to water plants (or dry the puppy), one simply points the water spray (or air flow) in the desired direction.

3.2 Mouse Interactions

It is possible to complete all SaeboVR activities using only a computer mouse to trigger the necessary interactions – just by clicking on the object(s) of interest. Thus if a player has difficulty grabbing an object, the therapist may click on the object to trigger it to jump into the player avatar's hand. If it is not clear which object(s) are interactive (clickable), pressing Fn+F2 will display colored spheres for all available interactions (see Figure 12). Pressing Fn+F2 again will turn off the display of the interactivity spheres.



Figure 12. Grocery Activity with Fn+F2 Pressed to Display Interactivity Spheres

In activities that involve list learning (i.e. Grocery Shopping, Pet Shopping, Garden Harvesting, and Soup Kitchen Volunteering), clicking on a hidden list's header will cause it to come into view. Clicking on it again will re-hide the header.

In activities that involve the laser pointer (e.g. for selecting a shopping aisle or choosing a puppy), you can complete the selection using the mouse by placing the cursor over the target area and holding down the left mouse button.

4 Difficulty settings

SaeboVR provides three selectable levels of difficulty for both Cognitive and Motor Challenges. These are adjusted from the Setting menu as described above.

4.1 Cognitive Difficulty

The Cognitive Difficulty setting adjusts the degree to which an activity challenges the player's memory, visual-spatial planning, attention, and executive function. In the Easy setting, the cognitive requirements on the player are minimized. For example, shopping lists are always displayed and the player is automatically taken to the shelf where the items on the list are found. As cognitive difficulty increases, the player is challenged to memorize items on lists, to group like items to reduce trips, and to choose where to go in order to find or put away items.

Note that regardless of Cognitive Difficulty setting, for any sub-task within an activity the player will always receive a visual cue (typically a green arrow) after 10 seconds (e.g. to show the location of the correct item) and a verbal cue after 20 seconds (e.g. to instruct the player to get the item).

4.2 Motor Difficulty

The Motor Difficulty setting adjusts the amount of repetition and range of arm motion required to complete the sub-tasks within an activity. In activities in which the number of interactions is

scalable with Motor Difficulty, the number of items involved ranges from 4 to 8 for Easy and from 12 up to 32 for Hard (with Medium lying in between). The approximate range of motion that may be required at each setting is illustrated in Figure 13.

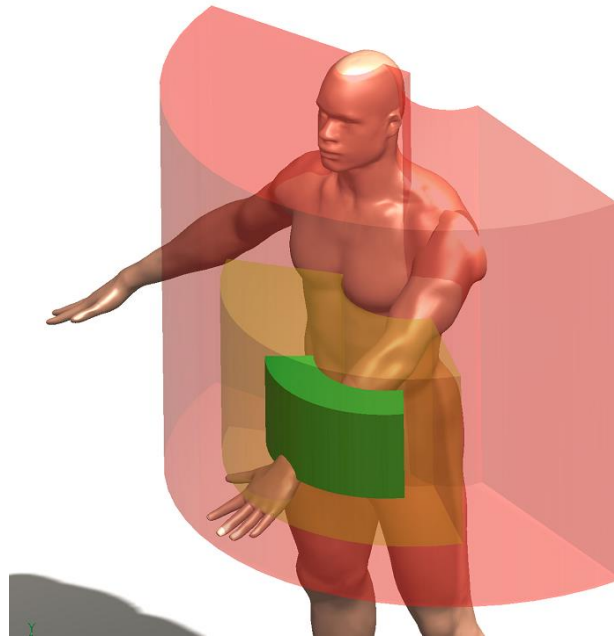


Figure 13. Motor Difficulty Regions (Green = Easy, Yellow = Medium, Red = Hard)

4.3 Guidance for Setting Difficulty Levels

It is recommended that both Cognitive Difficulty and Motor Difficulty be set to Easy while a new player is becoming familiar with the game and use of the Kinect tracking system to interact with the virtual world. Once selected, these settings persist for the user until changed using the player dashboard.

4.3.1 Motor Difficulty Setting

Motor Difficulty should be advanced if the player is not being sufficiently challenged by the motor demands of an activity. Individuals with significant strength, range of motion, and endurance may be able to quickly advance from Easy to Medium. A Motor Difficulty setting of Hard will require the player to exercise full range of arm motion.

4.3.2 Cognitive Difficulty Setting

Once a player demonstrates a degree of mastery in responding to the basic visual-spatial planning and attentional requirements of the activities in Easy mode, the therapist may advance the Cognitive Difficulty level.

It is not recommended that the Cognitive Difficulty level be advanced more quickly than Motor Difficulty. Generally, Motor Difficulty should be equal to or higher than Cognitive Difficulty to promote a more balanced feel to the virtual activities.

5 Activity Descriptions

5.1 Balls and Boxes

Balls and Boxes is a simple activity designed to challenge the user to exercise maximum range of motion and speed in moving virtual balls into boxes. It includes both motor and cognitive tasks. The motor component is a timed task that involves moving any of three balls into any of three boxes. These are arranged to require that a greater range of arm motion and speed be used to receive a greater number of gold coins. After each ball is placed, the arrangement of balls and boxes are switched to ensure that a diversity of functional reaching movements are involved.

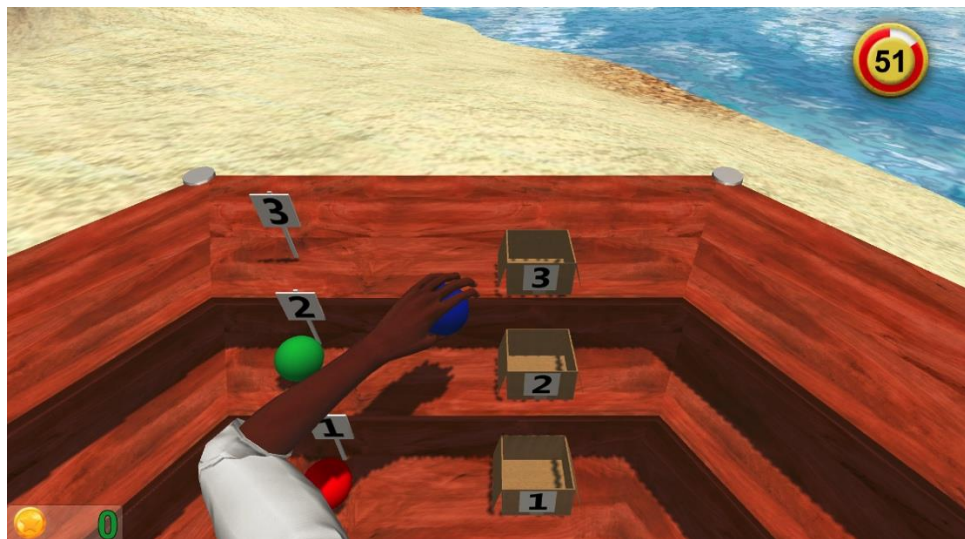


Figure 14. Balls and Boxes Motor Component

The cognitive component is an adaptation of the Stroop test for selective attention. The timed task presents a text cue that directs the player to place an object of a particular shape or color into a box.

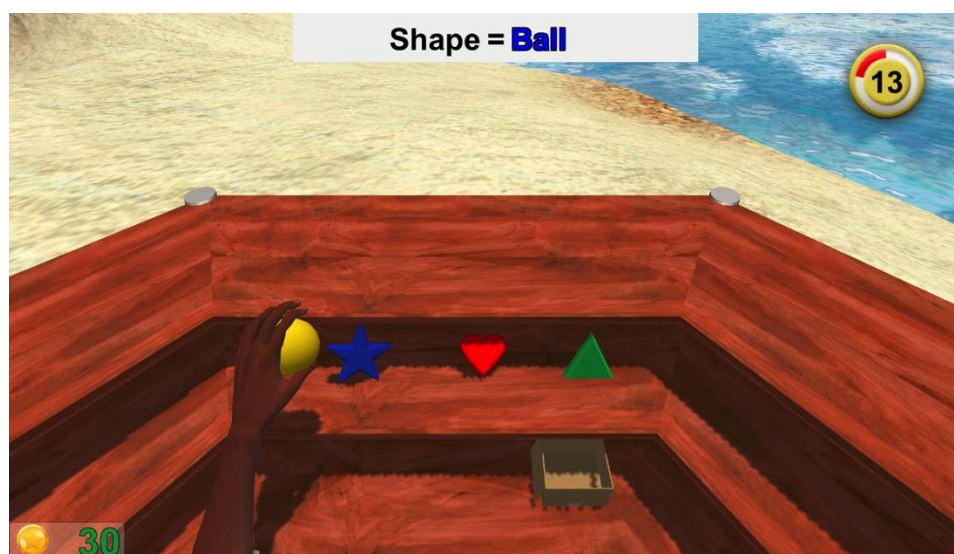


Figure 15. Balls and Boxes Cognitive Component

Balls and Boxes is the only activity that systematically involves both the user's impaired arm and his or her stronger arm. The motor and cognitive tasks are first performed with the stronger arm and then by the affected arm. It is also the only activity that is not impacted by the Motor Difficulty or Cognitive Difficulty settings. This is by-design, so that metrics are collected against a common baseline.

5.2 Grocery Shopping

In Grocery Shopping, the player is challenged to find and acquire items from a list provided by their virtual therapist. After the player is presented with the list and given some time to commit it to memory, the player must then choose which aisles to go down to find the items. Once in an aisle, the player moves to locations where there are four different options within the player's immediate reach. The player must decide which one is the correct item from the list and then physically reach for, acquire, and place the item in a shopping cart. This continues until the list is complete.

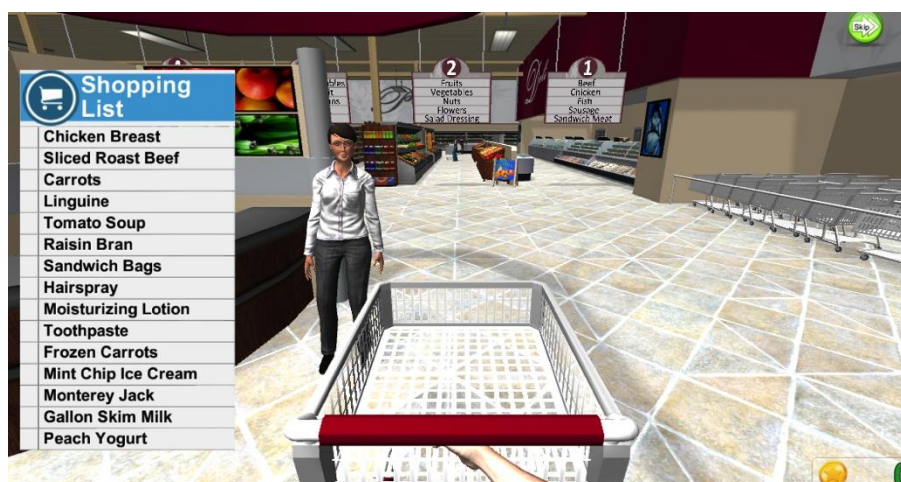


Figure 16. Grocery Shopping List Learning

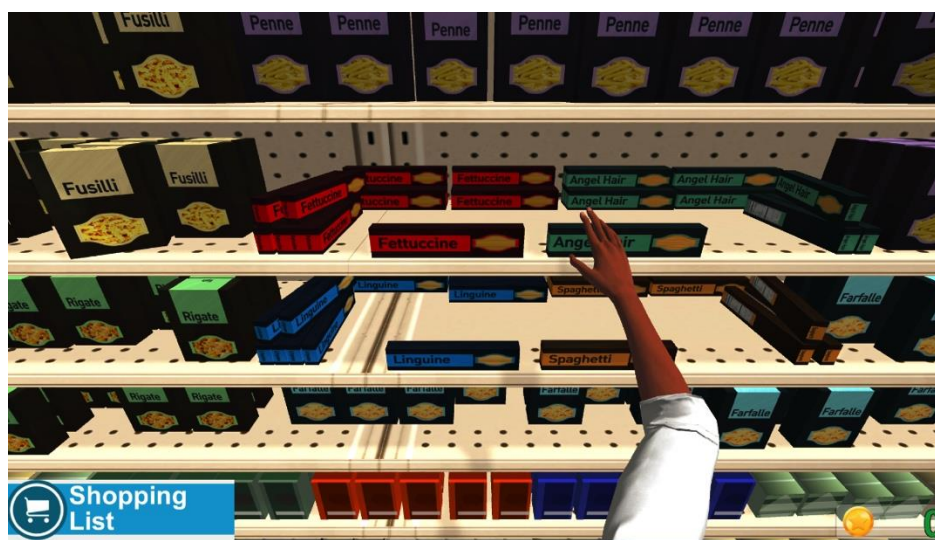


Figure 17. Grocery Shopping Acquiring Items from Shelf

5.2.1 Motor Difficulty

The Motor Difficulty setting determines how many items are on the shopping list and the range of motion required to reach for and place the items in the cart.

- EASY: 5 total items on the list, requiring player to go to 4 different aisles (Meats, Produce, Pasta, Soups);
- MEDIUM: 10 total items on the list, requiring player to go to 6 different aisles (adds Frozen Foods and Dairy);
- HARD: 15 total items on the list, requiring player to go to 9 different aisles (adds Bread and Cereal, Household Goods, and Toiletries);

5.2.2 Cognitive Difficulty

The Cognitive Difficulty setting also determines how often the player has access to the shopping list, and thus affects the memory requirements of the activity.

- EASY: the shopping list is displayed at all times;
- MEDIUM: the list is hidden, but displayed for 5 seconds each time an item is collected;
- HARD: the list is hidden, but displayed for 5 seconds each time 5 items are collected.

The Cognitive Difficulty setting determines if the user is required to select the correct aisles vs. auto-moved to the locations where the list items are found.

- EASY: player is automatically transported to the correct aisle locations for the items on the list;
- MEDIUM and HARD: the player selects the aisles to go to using the laser pointer to point to a desired location.

5.3 Putting Away Groceries

In this activity, the player is back at home and tasked with getting the items acquired during shopping into their correct locations in the home's refrigerator, freezer, pantry, or bathroom. At the beginning of the activity, the items are distributed on the kitchen counter. The player moves three items at a time to a rollator cart and is then asked to select which of the four locations to go to. After moving to a location, the player picks up an item from the cart and places it in the correct location (e.g. on the pantry shelf). The player is challenged to choose like items (e.g. all pantry items), to minimize the number of trips needed to put everything away.

Note that the most efficient way to complete this activity is to initially move items to the cart that must be stored in the same location (e.g. all the freezer items).

Note also that a player can return an item to the counter by moving it back to its original location.



Figure 18. Putting Away Groceries Moving Items to Cart



Figure 19. Putting Away Groceries Placing Items in Fridge

5.3.1 Motor Difficulty

The Motor Difficulty setting in Putting Away Groceries determines how many items are on the counter and the range of motion required to reach for and place the items.

- EASY: 6 total items, requiring player to go to 2 different locations (Freezer and Refrigerator);
- MEDIUM: 9 total items, requiring player to go to 3 different locations (adds Pantry);
- HARD: 12 total items, requiring player to go to 4 different locations (adds Bathroom);

5.3.2 Cognitive Difficulty

The Cognitive Difficulty setting determines if the user is required to select the locations vs. auto-moving to the refrigerator, freezer, pantry, or bathroom locations where the items placed in the cart must be stored.

- EASY: player is automatically transported to the correct locations for the items in the cart;
- MEDIUM and HARD: the player uses the laser pointer to point to a desired location.

5.4 Preparing Breakfast

The Preparing Breakfast activity is a highly-sequenced activity that involves frying eggs, making toast, and pouring juice to create a healthy meal. At each step, the player is challenged to recognize “what’s next” and take appropriate action. As with other activities, a visual cue in the form of a green arrow appears after 10 seconds if an action is not completed. After 20 seconds, an explicit verbal cue is provided. The activity thus involves memory, sequencing, and visual-spatial planning. The player must also recognize and then remedy potentially dangerous situations, such as a hot stove left on, or a cabinet door that remains open.



Figure 20. Preparing Breakfast in the Kitchen

5.4.1 Motor Difficulty

The Motor Difficulty setting determines the range of motion required to reach for and place the items. The setting does not shorten the activity.

5.4.2 Cognitive Difficulty

The Cognitive Difficulty setting has no impact on this activity. This is by-design to provide a consistent opportunity for the player to learn the task sequence from the first through the fourth repetition as they traverse the Road to Recovery.

5.5 Pet Shopping

Pet Shopping is similar to Grocery shopping. The activity starts with the player selecting a puppy to adopt. The chosen puppy then follows the player about the store while her new master collects the items necessary for her care and feeding. The player is challenged to find and acquire items from a list provided by their virtual therapist. After the player is presented with the list and given some time to commit it to memory, the player must then choose which aisles to go down to find the items. Once in an aisle, the player moves to locations where there are four items within the player’s immediate reach. The player must choose which one is the correct item from the list and then physically reach for, acquire, and place the item in a shopping cart. This continues until the list is complete.



Figure 21. Pet Shopping Adopting a Puppy



Figure 22. Pet Shopping Moving Through Aisles

5.5.1 Motor Difficulty

The Motor Difficulty setting determines how many items are on the shopping list and the range of motion required to reach for and place the items in the cart.

- EASY: 4 total items on the list, requiring player to go to 2 different aisles (Dog Food and Dog Toys);
- MEDIUM: 8 total items on the list, requiring player to go to 4 different aisles (adds Treats and Dog Bowls);
- HARD: 12 total items on the list, requiring player to go to 7 different aisles (adds Grooming, Medication, and Leashes/Collars);

5.5.2 Cognitive Difficulty

The Cognitive Difficulty setting determines how often the player has access to the shopping list, and thus alters the memory requirements of the activity.

- EASY: the shopping list is displayed at all times;
- MEDIUM: the list is hidden, but displayed for 5 seconds each time an item is collected;
- HARD: the list is hidden, but displayed for 5 seconds each time 5 items are collected.

The Cognitive Difficulty setting determines if the user is required to select the correct aisles vs. auto-moving to the locations where the list items are found.

- EASY: player is automatically transported to the correct aisle locations for the items on the list;
- MEDIUM and HARD: the player selects the aisles to go to using their hand to point to a desired location.

5.6 Pet Feeding

Pet Feeding is the shortest activity on the Islands. The player has brought the newly-adopted puppy home and is tasked with getting her food and water. This sequenced activity involves turning on the kitchen faucet, filling the water and food bowls, putting them down for the puppy to eat, and then letting her outside.



Figure 23. Pet Feeding Filling Water Bowl at Sink



Figure 24. Pet Feeding Dinner is Served

5.6.1 Motor Difficulty

The Motor Difficulty setting determines the range of motion required to reach for and place the items. The setting does not otherwise change the activity.

5.6.2 Cognitive Difficulty

The Cognitive Difficulty setting has no impact on this activity.

5.7 Pet Bathing

Pet Bathing starts with the puppy running around outside...and getting dirty. The player brings the puppy into the house and takes her to the walk-in shower in the bathroom to give her a bath. The sequenced activity involves basic toileting functions through the surrogate of the pet. Actions include using a shower spray nozzle to get the puppy wet, scrubbing her with a rubber brush (see Figure 25), and using a blow dryer to dry her off. Many of activities use the aforementioned “fill-up” mechanic which requires that an action, such as spraying, be performed for a certain duration before it is complete.



Figure 25. Pet Bathing Soaping Up Our Puppy

5.7.1 Motor Difficulty

The Motor Difficulty setting determines the range of motion required to reach for and place the items. The setting does not otherwise change the activity.

5.7.2 Cognitive Difficulty

The Cognitive Difficulty setting has no impact on this activity.

5.8 Garden Planting

The Garden Planting activity asks the player to plant up to six seedling plants. This requires staging the plants, two at a time, in a garden cart, and then selecting a garden bed with appropriate full sun, partial shade, or full shade conditions. At the garden bed, the player digs the necessary holes, places the seedlings, and then waters them before returning to the potting bench to retrieve more plants.

Note that the most efficient way to complete this activity is to initially move seedlings to the cart that belong in the same location within the garden (e.g. all the full sun plants).

Note also that a player can return an item to the potting bench by moving it back to its original location.

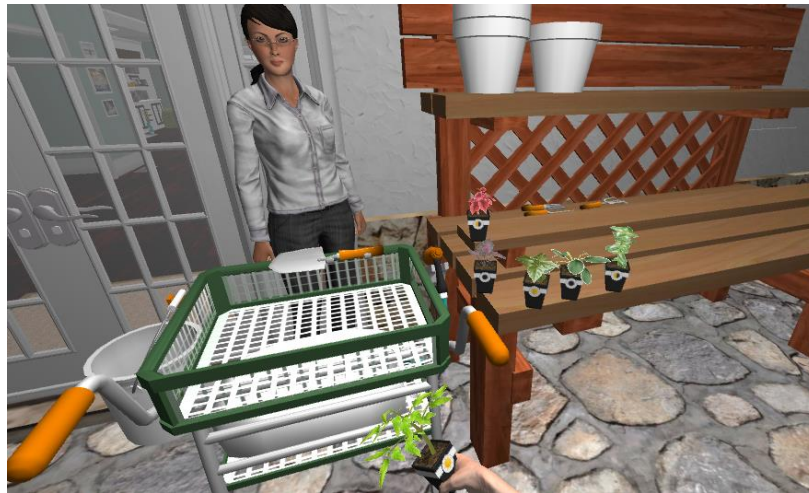


Figure 26. Garden Planting Moving Items to Cart



Figure 27. Garden Planting Watering Plants

5.8.1 Motor Difficulty

The Motor Difficulty setting in Garden Planting determines how many seedlings are on the potting bench as well as the range of motion required to reach for and place the items involved in the activity.

- EASY: 2 seedlings, requiring player to go to a single planting location (Full Sun);
- MEDIUM: 4 seedlings, requiring player to go to 2 different planting locations (adds Full Shade);
- HARD: 6 total items, requiring player to go to 3 different planting locations (adds Partial Shade);

It is recommended that this activity be played at least at the MEDIUM level to provide sufficient complexity and interest.

5.8.2 Cognitive Difficulty

The Cognitive Difficulty setting determines if the user is required to select the planting locations vs. auto-moving to the garden beds where the appropriate conditions exist for the selected seedling.

- EASY: player is automatically transported to the correct locations for the items in the cart;
- MEDIUM and HARD: player uses their hand to point to a desired location.

5.9 Garden Harvest

In Garden Harvest, the player returns to the garden, this time to harvest the vegetables that have since grown in the full sun garden bed. The player is presented with a list of items to harvest, which includes the number of each type of vegetables that are needed. After taking time to memorize this list, their task is then to select the appropriate plant. Once at the selected location, the player places a basket on the ground and places the required number of vegetables into the basket. The player then chooses another location, continuing until the list is completed.



Figure 28. Garden Harvest List Learning



Figure 29. Garden Harvest Picking Vegetables

5.9.1 Motor Difficulty

The Motor Difficulty setting in Garden Harvest determines both how many different vegetable types are on the list and the total number of items, as well as the range of motion required to reach for and place the items involved in the activity.

- EASY: 3 different plants (Yellow Zucchini, Green Pepper, and Red Tomato), requiring player to pick a total of 8 items;
- MEDIUM: 5 different plants (add Red Pepper and Yellow Tomato), requiring player to pick a total of 16 items;
- HARD: 8 different plants (add Green Zucchini, Striped Zucchini, and Yellow Pepper), requiring player to pick a total of 32 items;

5.9.2 Cognitive Difficulty

The Cognitive Difficulty setting determines how often the player has access to the list of vegetables to harvest, and thus affects the memory requirements of the activity.

- EASY: the shopping list is displayed at all times;
- MEDIUM: the list is hidden, but displayed for 5 seconds after finishing with one plant (e.g. getting 5 Red Peppers);
- HARD: the list is hidden, but displayed for 5 seconds after finishing with three plants.

The Cognitive Difficulty setting also determines if the user is required to select the locations vs. auto-moving to the plant where the items on the list are found.

- EASY: player is automatically transported to the correct locations for the items on the list;
- MEDIUM and HARD: the player uses their hand to point to a desired location.

5.10 Preparing Dinner

Preparing Dinner is similar to the Preparing Breakfast activity. It is a highly sequenced activity that involves making a dinner of baked chicken, potatoes, and sautéed vegetables (from the garden). At each step, the player is challenged to recognize “what’s next” and take appropriate action. As with other activities, a visual cue in the form of a green arrow appears after 10 seconds if an action is not completed. After 20 seconds, an explicit verbal cue is provided. The activity thus involves memory, sequencing, and visual-spatial planning. The player must also recognize dangerous situations, such as an oven or stove left on, or a cabinet door that remains open.



Figure 30. Preparing Dinner Plating Chicken

5.10.1 Motor Difficulty

The Motor Difficulty setting determines the range of motion required to reach for and place the items. The setting does not shorten the activity.

5.10.2 Cognitive Difficulty

The Cognitive Difficulty setting has no impact on this activity. This is by-design to provide an equal opportunity for the player to learn the task sequence from the first through the fourth repetition as they traverse the Road to Recovery.

5.11 Organizing Closet

In Organizing Closet, the player starts outside on the second floor balcony of the house. There is a clothesline with a variety of items. The first task is to take the clothes down from the line and put them in the appropriate spot on a laundry cart. Once all the items are collected, the activity proceeds through the bedroom into a walk-in closet where the player is tasked with putting the clothes away in appropriate locations. In the final task the player picks up three pairs of shoes and organizes them in cubbies according to an established pattern.



Figure 31. Organizing Closet Getting Items from Clothes Line



Figure 32. Organizing Closet Putting Items Away

5.11.1 Motor Difficulty

The Motor Difficulty setting in Organizing Closet determines the range of motion required to reach for and place the items involved in the activity. The total number of items to put away does not change.

5.11.2 Cognitive Difficulty

The Cognitive Difficulty setting does not affect this activity.

5.12 Soup Kitchen Volunteering

The final activity, Soup Kitchen Volunteering, places the player in the role of a helper at a local community center. The first task is to take a client's meal order and make the appropriate selections of a main course, starch, vegetable, dessert, and drink from a buffet line. The player is then given the opportunity to go through the buffet line and make their own selections, and subsequently sit down with the virtual therapist and the soup kitchen client to enjoy a meal. Once seated, the player uses a fork to eat all of the items on the tray and then drinks the beverage he or she selected. The player must take three bites of each of the four items to consume the meal.



Figure 33. Soup Kitchen Volunteering Memorizing the Meal Order



Figure 34. Soup Kitchen Volunteering Making Selections

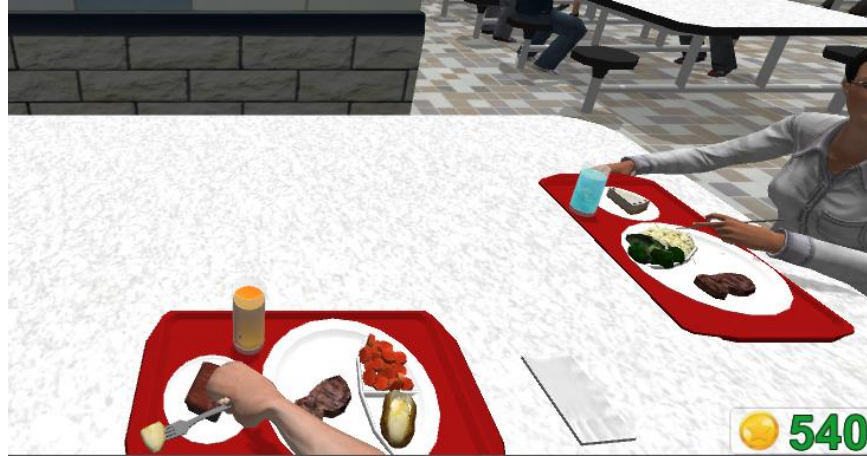


Figure 35. Soup Kitchen Volunteering Eating Our Meal

5.12.1 Motor Difficulty

The Motor Difficulty setting in Soup Kitchen Volunteering determines the range of motion required to reach for and place the items involved in the activity.

5.12.2 Cognitive Difficulty

The Cognitive Difficulty setting determines how often the player has access to the client's order from the menu.

- EASY: the client's order is displayed at all times;
- MEDIUM: the client's order is hidden, but displayed for 5 seconds each time a menu item is selected from the buffet line;
- HARD: the list is hidden after the initial learning phase.

6 Hotkeys

The following hotkeys provide quick access to some essential functions:

- K Reset Kinect tracking
- P Change person being tracked by the Kinect
- Esc: Pause/unpause the Game
- Shift+Esc Exit the activity and return to Player Dashboard
- Alt+F4 Quit program
(the preferred method is to use the Player Dashboard Menu – Quit)
- Fn+F2 Show/hide the interactivity spheres

7 Copyright

Information in this document may change without notice. This document does not provide you with any legal rights to any intellectual property.

© 2017 Virtual Therapy Solutions, LLC, ALL RIGHTS RESERVED

8 Customer Support

For customer support, please contact Saebo, Inc. by phone at 1.888.284.5433 or online at www.saebo.com.

NOTES

SaeboVR Patient App Keyboard Hotkeys

K	Reset Kinect tracking
P	Change person being tracked by the Kinect
Esc:	Pause/unpause the Game
Shift+Esc	Exit the activity and return to Player Dashboard
Alt+F4	Quit program