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Active Arcade

Active Arcade is a free mobile app that has several activities where the players are the controller. Meaning, players movement in the real world with the controller influences the actions the in-game character takes. What is great about this game besides it being free, is that the player can see themselves interacting with the virtual elements on screen in most of the activities within the game. This makes Active Arcade a great way to potentially challenge a player's spatial awareness. The games range from utilizing only the upper body, making it possible to play seated or standing depending on the positioning of the mobile device, to full body engagement. This means that either upper limb mobility coordination can be challenged to a degree or full body mobility and coordination can be challenged to a degree, depending on the activity that is chosen alongside as seated or standing balance. The activities are straightforward and intuitive, even more so than Switch Sports (See page 40). Player performance can be assessed through achieving new personal high scores and observing the player's quality of movement during the gameplay session.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: Active Arcade

Objects and Their Properties Required

Which Platform: Mobile

Time to Play: Generally each game takes ~2-3 minutes to play

This app consists of 14 mini games ranging in difficulty that require the player to use their body as the controller.

WM= Whack A Mole

The player uses their upper extremities to whack moles that appear on screen all around the player. This game can be played cooperatively.

LD= Laser Dodge

Players move their entire bodies to dodge lasers that cut off areas of the screen

BH= Bunny Hop

Players move side to side and jump (exaggerated shoulder shrugging or arm movement can trigger the jump as well) to navigate a vertical stage until the end goal is reached

RF= Reaction Flow

Players use their arms (and optionally legs) to hit numbered targets as they appear on screen. Targets must be hit in sequential order. This game can be played completely with another player

DT= Dribble Tag

It is recommended to play the game while dribbling a ball. Players work to hit green targets with their off hand and orange targets with the ball.

SH= Super Hits

This is a rhythm game that has two different playstyles. The first and harder of the two styles is where players must wave their arms in the direction of the arrow as it approaches the player on screen. In the second option the screen is divided into six sections, three on the left and right of the player. The player must place their hand in the section as the notes approach the player. There are different difficulty levels for the songs available.

BA= Box Attack

Players must move their entire bodies to fit their bodies into box cutouts on screen. Requires jumping and getting up and down from the floor.

SP= Space Pong

Players use one hand to act as a paddle to volley a ball back and forth. Where the player's hand is positioned is where the paddle goes. Can be played completely online.

CK= Cone Knockout

Players move laterally back and forth and bend down to hit cones. This game works similarly to a shuttle run done laterally.

HK= High Kicks

Players use their arms and legs to hit targets as they appear on screen.

GJ= Galaxy Jumpers

Players navigate a ship through an obstacle course, where the frequency of jumping determines how high their ship flies. Less jumping or no jumping causes the ship to fall. Can be played cooperatively with up to three other players. Requires small jumps.

FP= Fit Pals

This game is essentially a jump counter, where players jump along with a chosen animal on screen. Can be played cooperatively.

P= Pose

Players position their entire bodies in such a way to mimic the pose shown on screen. This game requires to maintain balance in awkward positions (one foot and off axis)

R= Reaction

Players use their upper extremities to target as they appear on screen. The quicker the player hits the target the more points they are awarded. Can be played completely with another player

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions, praxis, cognitive flexibility, insight	X	
Attention: sustained attention and concentration; selective, divided, and shifting attention		The player must sustain attention during gameplay in order to be successful during gameplay. Most games have a timer in which the player must attend for that duration procuring points. If players do not attend they will score lower. Players' selective attention will be challenged in WM, RF, SP, HK, and R because there are elements the player must filter out or avoid (bombs and red targets) as well as reacting to the ball as it approaches in SP.
Memory: short-term, working, and long-term memory	X	
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive		Each game will challenge the players proprioceptive and vestibular ability. In each game, the player is the controller, using their whole bodies in LD, BH, DT, BA, CK, HK, GJ, FP, P and only required to use their upper extremities in WM, RF, SH, SP, R
Thought: control and content of thought, awareness of reality, logical and coherent thought		The player must have a baseline level of awareness of reality. But there is no direct challenge to thought. The games are simplistic.
Sequencing complex movement: regulating speed, response, quality,		Each game will challenge the players ability sequence complex movements In each game, the player is the controller, using their whole

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
and time of motor production		<p>bodies thus requiring the sequence of full body movements such as getting up and down from the floor, jumping, bending, squatting, kicking, and lateral movement in LD, BH, DT, BA, CK, HK, GJ, FP, P and only required to use their upper extremities in WM, RF, SH, SP, R. Thus, challenge upper extremity ROM, reaching ability, and accuracy of movement. The games that only require the player to use their upper extremities can be played while seated successfully.</p> <p>Regulating speed, response, quality and time of motor production all are factors that will affect the players overall scores since most games are on a timer. Hitting a number of targets or moving their bodies into a space on screen before the prompt runs out (in LD and BA) in a set amount of time to achieve higher scores.</p>
Emotional: regulation and range of emotion, appropriateness of emotions		Players compete against themselves in trying to beat their own scores. Players must be able to regulate their emotions in the cases where they are frustrated about not being able to beat their own score or when losing to another player (when playing the competitive games, see descriptions above)
Experience of self and time: appropriateness and range of emotion, body image, self-concept		Each game shows an image of the player during gameplay except for JP. This can challenge how the player perceives themselves and play into body image
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful state		Complete consciousness is necessary in order to be successful in playing this game.
Orientation: orientation to person and self, place, time, and others	X	
Temperament and personality: extroversion, introversion,		Confidence and motivation can be challenged through the use of scores being tracked. Players compete against themselves in most

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		<p>cases with exception to cases in which games are played completely (see game descriptions above).</p> <p>Openness to trying new things is required when the player has never played the game before and self-expression can be induced when reacting to their and or their partner's performance during gameplay.</p>
Energy and drive: motivation, impulse control, appetite		<p>Each game will challenge the player's energy and drive to a degree. The player is the controller, using their whole bodies thus requiring the sequence of full body movements such as getting up and down from the floor, jumping, bending, squatting, kicking, and lateral movement in LD, BH, DT, BA, CK, HK, GJ, FP, and P. These games will require a significant amount of energy expenditure from the player. The games that only require the use of the upper extremities in WM, RF, SH, SP, R will require less energy expenditure generally.</p> <p>Therapists must be mindful of the specific client's abilities and capacities.</p>
<i>Sensory Functions</i>		
Visual: quality of vision, visual acuity, visual stability, visual field		<p>A player must possess adequate levels of vision to distinguish objects on a screen. Players must possess enough visual acuity to determine where they are on screen, as well as identifying targets as they appear on screen. In the case of RF hitting targets in the proper order, requires that players can see the number on the targets.</p> <p>There is a degree of visual tracking to be effective in this game specifically in SP where the player must track the ball as it is volleyed back and forth.</p>
Hearing; sound detection and discrimination; awareness of location and distance of sounds	X	

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Vestibular: position, balance, secure movement against gravity		Each game will challenge the player's vestibular ability to a degree. In the full body games, LD, BH, DT, BA, CK, HK, GJ, FP, and P. There are times when balance is challenged to a degree because of the awkward body positions the player is required to take, standing on one foot, jumping, moving laterally and/or standing off axis. This is especially the case in P. The games that only require the player to use their upper extremities (WM, RF, SH, SP, R), challenge upper extremity ROM, reaching ability, and accuracy of movements and can be played while seated successfully. Playing games will challenge vestibular ability through seated balance.
Proprioceptive: awareness of body position and space		The player moves in physical space to interact with virtual elements (hitting targets) as they present on screen. They must also be able perceive their body in space to determine where their limbs are in space and if they have enough room to perform the necessary movements. This ranges to just the upper body to full body depending on the game that is picked.
Touch: feeling of being touched, touching various textures	X	
Pain: localized and generalized pain	X	
Temperature and pressure: thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility: range of motion		Can be determined by the therapist. The therapist must be aware of their client's own ability before having them attempt a given game. In each game, the player is the controller, using their whole bodies thus requiring the

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		<p>player to mobilize multiple joints or challenge their joint mobility such as getting up and down from the floor, jumping, bending, squatting, kicking, and lateral movement in LD, BH, DT, BA, CK, HK, GJ, FP, P and only required to use their upper extremities in WM, RF, SH, SP, R. Thus, only challenging upper extremity ROM, reaching ability, and accuracy of movement. The games that only require the player to use their upper extremities can be successfully played while seated.</p> <p>Each of the required movements to successfully engage in gameplay will challenge a player's joint mobility.</p>
Joint stability: structural integrity of joints		Therapists should be aware of client limitations before having them attempt a given game.
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction		Some games require the player to hold abnormal poses (LD, BA, P) or hold their arms up for an extended period of time (WM, SH, SP) thus challenging the player's muscle endurance.
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting reactions		<p>All games will challenge all elements of involuntary movement control.</p> <p>In each game, the player is the controller, requiring the player to move and position their bodies in various ways such as getting up and down from the floor, jumping, bending, squatting, kicking, and lateral movement in LD, BH, DT, BA, CK, HK, GJ, FP, P and only required to use their upper extremities in WM, RF, SH, SP, R. Thus, only challenging upper extremity ROM, reaching ability, and accuracy of movement. The games that only require the player to use their upper extremities can be played while seated successfully.</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		All of this requires that the player maintain postural control, adjust their body position, and challenge supporting reactions standing or seated.
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		Each game requires a significant ability to control voluntary movement, eye hand coordination, and/or foot hand coordination, bilateral integration, gross motor control and oculomotor control are all challenged to a degree depending on which game is selected. The only exception being FP. FP is only jumping up and down and so this game specifically only requires gross motor control. The degree to which each is challenged is varied within each game as some games are inherently more challenging than others.
Gait patterns: movements used to walk		CK, LD, BH, and BA will challenge the player's ability to move laterally in order to position themselves effectively on screen.
Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function		
Cardiovascular system: blood pressure, heart rate and rhythm		Depending on the amount of exertion exhibited during gameplay, the cardiovascular system could be challenged for some to a degree.
Respiratory system: rate, rhythm, depth of respiration		Depending on the amount of exertion exhibited during gameplay, the respiratory system could be challenged for some to a degree.
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity		The degree of challenge to physical endurance and stamina depends on the length of the play session and how much motion the player is producing during gameplay (given their ability). Depending on the amount of exertion exhibited during gameplay, additional functions could be challenged for some to a degree especially when considering length of play sessions, challenge to stamina and aerobic capacity can be graded (number of attempts, or whether to play seated or

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		standing). Players must possess enough physical endurance, stamina, and aerobic capacity to last for the duration of a game's singular duration. In most cases, this is 30-60 seconds.
Voice and speech: rhythm and fluency, alternative vocalization functions		<p>During cooperative gameplay players can communicate, vocalizing information to each other. Players could use speech to relay information if playing as intended. Such as in WM communication can consist of who gets what targets and or helping each other identify when bombs are present on screen.</p> <p>But this is not specifically required to be successful.</p>

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		
Aligns		<p>The degree to which this is challenged can be determined by the therapist..</p> <p>Some of the games have the player standing. Others have the player seated.</p>
Stabilizes		<p>In each game, the player is the controller, requiring the player to move and position their bodies in various ways in which require various degrees of stabilization such as getting up and down from the floor, jumping, bending, squatting, kicking, and lateral movement in LD, BH, DT, BA, CK, HK, GJ, FP, P and only required to use their upper extremities in WM, RF, SH, SP, R. Thus, only challenging upper extremity ROM, reaching ability, and accuracy of movement. The games that only require the player to use their upper extremities can be played while seated successfully. Challenging the players ability to stabilize themselves while seated</p> <p>P will especially challenge this because the player will frequently be prompted to stand on one foot</p>

SKILL	N/A	Context of Skill Within the Game
		and on off axis.
Positions		The player needs to position themselves with some level of precision in order to be successful during gameplay. Specifically in LD and BA because the player will be prompted to position their bodies in a specific area of the screen in order to be successful.
Reaches		The player is required to reach in physical space to interact with virtual elements shown on screen. Specifically, in RF, DT, SH, SP, CK, HK, P, and R all have various degrees of reaching required in order to be successful
Bends		Full body games (LD, BH, DT, BA, CK, HK, GJ, FP, P) will challenge the player's ability to bend to some degree, because the player will need to move and position their bodies in various ways in which require various degrees of bending such as getting up and down from the floor, jumping, bending, squatting, kicking, and lateral movement
Grips	X	
Manipulates	X	
Coordinates		Each game will challenge the players ability to coordinate movements to some degree. In each game, the player is the controller, using their whole bodies thus requiring the coordination of full body movements such as getting up and down from the floor, jumping, bending, squatting, kicking, and lateral movement in LD, BH, DT, BA, CK, HK, GJ, FP, P and only required to use their upper extremities in WM, RF, SH, SP, R. Thus, challenging the player's ability to coordinate upper extremity movement.
Moves	X	
Lifts	X	
Walks		Players do not walk specifically, but some games; CK, LD, BH, and BA will require the player to move laterally in order to position themselves effectively on screen
Transports	X	
Calibrates	X	
Flows		Actions must be smooth and deliberate to be effective during gameplay especially when

SKILL	N/A	Context of Skill Within the Game
		attempting to reach the higher levels and for them to register accurately by the device.
Endures		The player will be challenged to sustain the required movements/positions throughout the duration of a round of gameplay.
Paces		The rhythm games will challenge the players ability to keep pace with the music.
<i>Process Skills</i>		
Paces		Players need to mentally process and maintain (body movement tempo) at a consistent or increasing rate in order to achieve better scores.
Attends		A player must attend to the game throughout the length of the gameplay session, otherwise there will be an increased rate of failure or lower scores.
Heeds		Can be determined by the therapist The player completes gameplay under parameters requested by the therapist (execute the motions as directed by therapist).
Chooses		If allowed by the therapist, the player can choose which game they want to play or the therapist can provide the player with options.
Uses	X	
Handles	X	
Inquires		Can be determined by therapist But not required to be successful (i.e. asking clarifying questions when necessary in order to play the game successfully).
Initiates		Players begin performing required actions when gameplay starts.
Continues		Players continue required actions for the duration of the round of gameplay.
Sequences		RF requires players to hit targets in a numbered order. SH requires the player hit notes in rhythm with the music.
Terminates		The player ceases required movements when the gameplay round ends.
Searches/locates		In WM, LD, BH, RF, DT, BA, HK, and R the player is required to scan the screen and locate target elements or platforms to interact with in order to score points or reaching the goal.
Gathers	X	

SKILL	N/A	Context of Skill Within the Game
Organizes	X	
Restores	X	
Navigates		BH requires that players use their bodies to navigate a vertical stage to reach the end goal.
Notices/responds		The player notices and responds to how different virtual elements affect them (i.e. WM with bombs and different colored moles then RF, HK, DT, and R with different colored targets).
Adjusts		The player adjusts their gameplay in subsequent attempts in order to achieve higher scores.
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.
<i>Social Skills</i> The therapist can address social interaction skills using the game but this is client specific and thus can be determined by the therapist. Some games do allow for play with another player (see descriptions above). Otherwise, social interaction skills are not required to be successful in game.		
Approaches/starts		Players start relaying necessary information to each other. Not specifically required to be successful.
Concludes/disengages	X	
Produces speech		Players may produce speech in order to communicate with each other in order to be most successful. Not specifically required to engage in gameplay effectively.
Gesticulates		Can be used to communicate if players are playing in the same space.
Speaks fluently		Players speak in ways that both players can understand when vocal communication is occurring.
Turns toward	X	
Looks	X	
Places self	X	
Touches		Can be determined by the therapist (appropriate touching). May be present but not required to be successful.
Regulates		Players are able to remain focused on information relevant to the game.
Questions		Players are able to ask for appropriate clarifying information, when necessary, amongst each other

SKILL	N/A	Context of Skill Within the Game
		or from the therapist. (i.e. What did you want me to do. How do I do X again).
Replies		Players continue relaying necessary information, responding accordingly when necessary. Thus, leading to better coordination and cooperation during gameplay.
Discloses	X	
Expresses emotion		Can be determined by the therapist. Players appropriately express their own emotions and their emotions toward one another such as when one player messes up causing both to fail or not achieve a higher score.
Disagrees		Players may need to appropriately express their differing opinions such as when discussing strategy on how to best go about achieving a higher score.
Thanks		May be present but not required to be successful.
Transitions	X	
Times response		Players respond to each other in a timely manner. Failure to respond in a timely manner can cause either player to make unnecessary mistakes due to them not knowing otherwise, information needs to be communicated quickly and efficiently. Only applies if players are actively communicating with each other but this is not specifically required to successfully engage in gameplay.
Times duration		Players respond to each other in a timely manner. Failure to respond in a timely manner can cause either player to make unnecessary mistakes due to poor coordination. Only applies if players are actively communicating with each other but this is not specifically required to successfully engage in gameplay.
Takes turns		Can be determined by the therapist if working with multiple patients or between themselves and their patient.
Matches language		May be present but not required to be successful.
Clarifies		Players are able to clarify what they are attempting to communicate to the other player or therapist when necessary or when asked. Such as a gameplay strategy idea they may have.

SKILL	N/A	Context of Skill Within the Game
Acknowledges and encourages		Players are able to acknowledge each other's frustrations when present as when trying to achieve a new high score and are able to appropriately encourage each other when necessary.
Empathizes		May be present but not required to be successful. Players are able to recognize the emotions the other is feeling, such as when getting frustrated and able to understand why they are feeling that way.
Heeds		Players heed to the others instructions when appropriate and able to communicate effective and coordinate actions cooperatively in order to be successful in achieving higher scores
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.

Areas of Treatment (Application)

Postural control

Balance

ROM

Muscular strength and endurance

Coordination

Interest Tags

Music, Dancing

Arms

The game Arms provides an experience very similar to the beloved Wii Sports Boxing. Core aspects of this game provide a great way to challenge the player's upper-extremity movement and range of motion. The game primarily utilizes punching motions from the player to throw punches in game. The game also offers functionality beyond basic punching found in Wii Boxing. This includes the ability to dodge, jump, and dash as well. Along with being able to throw punches with both arms, the dodge and dash abilities are activated with motions utilizing both limbs at once, thus incorporating an element of bilateral integration. However, focus can be kept on upper-extremity range of motion and endurance by setting the opponent's difficulty to "low" and choosing a small, simple arena that does not require a lot of navigation.

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Video Game Activity Analysis Template

Title of Video Game: Arms (motion controls)

Objects and Their Properties Required

Which Platform: Nintendo Switch

Time to Play: 1-2min to complete a default match

Sequencing and Timing

1. Select versus match
2. Choose Character
3. Select fist modifications
4. Match starts
5. Perform punching actions to perform punches in game
6. Tilt joy-con controllers to block and dodge punches from opponent
7. Do enough damage to opponent to win the round
8. Repeat steps 3-7 for round two

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept		Players are in a boxing match. In fighting matches, knowing when to press the attack or

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
formation, metacognition, executive functions, praxis, cognitive flexibility, insight		<p>hold off and defend, depends on many factors that the player must be cognizant of in order to be successful.</p> <p>The player needs to make decisions and react based on in-game situations. Taking into account their opponents' actions and abilities; as well as health and the amount of super meter each player has. This requires a degree of judgment and cognitive flexibility.</p>
Attention: sustained attention and concentration; selective, divided, and shifting attention		<p>The player must remain attentive to both of their fists and the opponents' fists. In game modes with multiple targets, they must remain attentive to those targets in order to react appropriately.</p> <p>Analyzing their opponent in order to know what is coming and reacting, takes a degree of concentration and sustained attention. If the player does not concentrate on the game during gameplay. They will be beaten up and eventually lose the round and or match</p>
Memory: short-term, working, and long-term memory	x	
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive		<p>In game: There are audio and visual cues that identify when actively punching and when power ups are available. There are also unique audio and visual cues for player/opponent attacks that cue the player to what is coming or occurring.</p> <p>The player must be aware of their body in space. Possessing enough proprioception to identify where their limbs are in space, so that they can perform the actions necessary for gameplay (punches) will lead to better outcomes.</p> <p>Vestibular sense can be incorporated if the game is played while standing or free sitting given the client's abilities.</p>
Thought: control and		Players need to logically analyze the "in

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
content of thought, awareness of reality, logical and coherent thought		game” situation and take appropriate actions to be successful. Matches are ever changing and so circumstances constantly change as well. An example would be closing space before executing a move that has a finite amount of range so that the move connects.
Sequencing complex movement: regulating speed, response, quality, and time of motor production		<p>This game requires sequencing of movement within the upper arm including shoulder, elbow, wrist, thumb, and fingers to effectively play the game.</p> <p>The player actively throws punches to execute actions in game. Different types of punches execute different actions: two hand punches execute a grapple and throw, punching. While supinating or pronating the wrist will throw a hook punch in game in that direction. Tilting the joy-cons in various directions perform dodges and dashes.</p> <p>In order to make progress in game, gameplay necessitates that players perfect timing of movements (i.e. jumps, dodges and punches). For this to be accomplished, the player's ability to regulate the speed in which they provide input to the controller, response time, and time of motor production will all be challenged to a degree.</p>
Emotional: regulation and range of emotion, appropriateness of emotions		<p>It is assumed some might easily be caught in the emotion of the game as it is competitive.</p> <p>The player must demonstrate a degree of emotional regulation in this case in order to keep their emotions appropriate for the given situation.</p>
Experience of self and time: appropriateness and range of emotion, body image, self-concept	X	
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful		Complete consciousness is necessary in order to be successful in playing this game.

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
state		
Orientation: orientation to person and self, place, time, and others	x	
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		<p>Can be determined by the therapist</p> <p>When playing versus other people, a degree of conscientiousness is necessary as there should be healthy competition, but not a demeaning or rudeness amongst the players to each other.</p> <p>Emotional stability, self-expression, confidence, motivation, self-control and impulse are all elements that can be challenged to a degree. Self-control and impulse are challenged, as players must keep the appropriate range of emotion while playing the game and not get caught up in the competitive nature of the game.</p> <p>If the player is having difficulties winning a match, a degree of confidence and motivation is necessary to persevere and to be able to deal with losing. Self expression may be present when players celebrate a win or deal with a loss.</p>
Energy and drive: motivation, impulse control, appetite		<p>There is a substantial degree of upper limb movement required to effectively play this game. Players actively throw many punches throughout a match for the duration of a match. Players must also possess enough motivation and drive to persevere when they face a challenge in game that they cannot easily overcome.</p>
<i>Sensory Functions</i>		
Visual: quality of vision, visual acuity, visual stability, visual field		<p>The player must have enough visual ability to perceive elements on the screen. Players must possess enough visual acuity to determine where they are on screen as well as obstacles to navigate through stages and respond to the actions their opponents are taking. Players must also track a number of enemies when playing game modes that have</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		<p>multiple opponents at one time.</p> <p>There is also a degree of visual tracking to be effective in this game (i.e. tracking fists) both their own fists and their opponents so that they can take appropriate actions to dodge.</p> <p>At times there can be a lot of visual stimuli on screen (number of enemies, shifting stage elements, and visual effects from attacks). Players must be able to filter out excessive stimuli in order to focus on the important stimuli.</p>
Hearing ; sound detection and discrimination; awareness of location and distance of sounds		<p>There are audio cues that signify when punching and when the player has power ups, but hearing is not necessary to effectively play the game. There are also unique audio and visual cues for player/opponent attacks that cue the player to what is coming.</p>
Vestibular : position, balance, secure movement against gravity		<p>Can be determined by the therapist.</p> <p>Punching motions are required to play the game so the player must be able to sustain their balance while performing these actions.</p> <p>Can be graded up or down (i.e. performed seated or standing or on a dynamic surface).</p>
Proprioceptive : awareness of body position and space		<p>At minimum, players must be able to perceive their body in space, to determine where their upper limbs are in space and if they have enough room to perform the necessary punching actions.</p>
Touch : feeling of being touched, touching various textures		<p>The game requires the use of a controller that the player must physically interact with. Players must be able to tell they are holding the controller and/or if they are hitting the desired inputs (triggers vs buttons vs joysticks) and if they are interacting with the joystick in the desired manner (orienting to the desired direction and not pressing down with excessive force) as this actuates another input L3 & R3; which can lead to unintended actions if the player did not mean to press</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		those inputs.
Pain: localized and generalized pain	X	
Temperature and pressure: thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility: range of motion		<p>At minimum the player must be able to minimally flex their shoulder and/or ulnarly deviate their wrist.</p> <p>The therapist can grade up the motion to a full punching motion.</p> <p>A player must also have enough joint mobility in the hands and fingers to interact with the input device. The game requires rapid button presses as well as timely responses on specific inputs (i.e. jumping and dodging, which is executed by tilting the joy-cons in a direction) in order to be successful. Thus, challenging the player's ROM and precision of the hand, finger, thumb, and wrist joints.</p>
Joint stability: structural integrity of joints		At minimum the player must be able to sustain structural stability while performing the motions described above in joint mobility, especially when performing full punching motions.
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction		The player's muscular endurance will be challenged while playing this game. Players must be able to keep throwing punches throughout the duration of a match. If players are unable to do so, they will not be able to defeat their opponent thus leading to failure.
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting reactions		The player must have enough postural control to maintain position while performing the required motions of the game (see joint mobility).

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		The degree required can be determined by the therapist.
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		<p>The game requires a significant ability to control voluntary movement, eye hand coordination, bilateral integration, gross motor control and oculomotor control are all challenged to a degree when playing this game.</p> <p>Players coordinate movements between both limbs (tilting both joy-cons to dodge or dash, punching with both arms in order to grapple and throw) utilizing bilateral integration (punching with both arms), and crossing midline when throwing hook punches. Players exhibit fine motor control when interacting with the input device (moving the joystick accurately and pressing desired buttons), effective gross motor control when executing punches, and eye hand coordination in order to hit the desired target and the game requires players to perform actions in a timely manner.</p>
Gait patterns: movements used to walk	X	
<i>Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function</i>		
Cardiovascular system: blood pressure, heart rate and rhythm		<p>Can be determined by the therapist.</p> <p>Depending on the amount of exertion exhibited during gameplay, the cardiovascular system could be challenged for some to a degree.</p>
Respiratory system: rate, rhythm, depth of respiration		<p>Can be determined by therapist</p> <p>Depending on the amount of exertion exhibited during gameplay, the respiratory system could be challenged for some to a degree.</p>
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity		<p>Can be determined by therapist</p> <p>The required amount of endurance depends on how much motion the player is producing (given their ability).</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		<p>When performing full punches, a minimal-moderate level of endurance is required from an average individual.</p> <p>Depending on the amount of exertion exhibited during gameplay, additional functions could be challenged for some to a degree, especially when considering length of play sessions, challenge to physical endurance, stamina, and aerobic capacity can be graded.</p>
Voice and speech: rhythm and fluency, alternative vocalization functions	X	

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		
Aligns		<p>Can be determined by the therapist.</p> <p>Ability to maintain posture without propping is required to effectively play the game. Under normal circumstances both hands are used to play the game.</p>
Stabilizes		<p>Can be determined by the therapist.</p> <p>The challenge to stabilization can be graded to fit the client's ability.</p>
Positions		The player must position themselves within the environment in such a way to provide adequate enough space to perform actions necessary to play the game.
Reaches		<p>Can be determined by the therapist (See joint mobility).</p> <p>The player performs the required motions to execute actions within the game and can be graded to fit their own ability.</p>
Bends	X	

SKILL	N/A	Context of Skill Within the Game
Grips		Must be able to maintain grip of joy-con controllers, ideally in both hands, while performing the necessary actions.
Manipulates		Interacting with the input device requires a degree of manipulation in order to press the desired inputs in a timely manner.
Coordinates		This game necessitates the ability to coordinate upper limb movement to be effective at playing the game. The player throws punches with both arms as well as tilting both joy-cons in synchronicity in a direction to dodge, dash and block.
Moves	X	
Lifts		Lifting the joy-con controller is required in order to throw punches with them in hand.
Walks	X	
Transports	X	
Calibrates		Can be determined by a therapist. It takes very little motion to actually execute an action within the game (see joint mobility). However, this can be graded up (i.e. full punching motion) thus requiring a higher level of calibration.
Flows		Actions must be smooth and deliberate to be effective during gameplay. Throwing a combo of punches is most effective in order to keep the opponent at bay. If there is significant delay between actions, the player may be vulnerable to counter attack by their opponent.
Endures		Default matches are two rounds of 99 seconds (most rounds last 30-60 seconds) Other game modes (i.e. 1 vs 100) will take longer to fully complete. The player must endure postural control and hand, finger, wrist, and upper extremity movements for the duration of the gameplay session or until they reach a suitable stopping point.
Paces		Can be determined by the therapist The player must maintain the same rate and tempo throughout the matches.

SKILL	N/A	Context of Skill Within the Game
		A slowing in pace at times can leave the player vulnerable. At the same time, the player cannot throw punches wildly, because this can be easily countered by the opponent especially at higher difficulties.
<i>Process Skills</i>		
Paces		<p>The player cannot constantly throw punches. There is a level of timing and tempo required in order to be effective during gameplay.</p> <p>Timing and tempo will change for each match, because it depends on many variables that the player has to process while in the match. This includes the arena, each players' health, how much super energy each player has, what types of attacks each player has and so on.</p>
Attends		The player must attend the game until completion in order to be successful. Otherwise, they will not be able to react to what their opponent is doing.
Heeds		<p>Can be determined by the therapist</p> <p>The player completes gameplay under parameters requested by the therapist (i.e. full punches).</p>
Chooses		The players can choose from different boxing gloves at the beginning of each round. Each glove has a different mechanic that may better aid the player. (like a boomerang fist, and a heavy hitting wrecking ball fist).
Uses		The player must use the joy-con controllers as they are intended.
Handles		Players must hold joy-cons in the requested manner (thumb up in a neutral wrist position).
Inquires		<p>Can be determined by therapist</p> <p>Players can ask for clarifying questions of the therapist whenever necessary.</p> <p>But not required to be successful.</p>
Initiates		They must initiate multiple actions fluidly in order to be effective during gameplay (i.e. multiple punches or jumps/dodges).
Continues		The player continues various gameplay actions until the end of the match.
Sequences	X	

SKILL	N/A	Context of Skill Within the Game
Terminates		There are times when it is most appropriate to punch and when to dodge. Players will be challenged to appropriately terminate their present action and switch to another at the most opportune time in order to be most successful during gameplay. If the player punches wildly, that can be easily countered and if the player keeps blocking that leaves the player open to grapples.
Searches/locates		Players can search and locate health and super boosts on stage to aid them in being successful in a match.
Gathers	X	
Restores	X	
Navigates	X	
Notices/responds	X	
Adjusts	X	
Accommodates		Can be determined by the therapist. This is client specific.
Benefits		Can be determined by the therapist. This is client specific.
<i>Social Interaction Skills</i> The game has multiplayer but players compete against each other. There is no communication necessitated by the game itself. With that said, all social interaction skills are client/session specific. Thus, applications can be determined by the therapist but are not required to be successful during gameplay.		
Approaches/starts		
Concludes/disengages		
Produces speech		
Gesticulates		
Speaks fluently		
Turns toward		
Looks		
Places self		
Touches		
Regulates		
Questions		
Replies		
Discloses		
Expresses emotion		
Disagrees		
Thanks		

SKILL	N/A	Context of Skill Within the Game
Transitions		
Times response		
Times duration		
Takes turns		
Matches language		
Clarifies		
Acknowledges and encourages		
Empathizes		
Heeds		
Accommodates		
Benefits		

Areas of Treatment (Application)

Stroke Rehab

Muscular Strength/Endurance

ROM

Postural Stability

CP

Parkinson's

Interest Tags

Sports

Boxing

Ring Fit Adventure

Ring Fit offers a variety of gross motor and balance activities. This can be accomplished through mini games or workout routines. Both the mini games and workout routines are categorized by the muscle group they target. The amount of exertion required from the player can be graded to varying degrees. For example, you can change the amount of force needed to actuate the Ring Fit controller. Additionally, the “knee friendly” setting can be enabled which makes registering leg movements either easier or eliminates the need for them entirely depending on the activity. Ring Fit Adventure mode is a story-based mode in which players progress through various stages by jogging in place and utilizing the players body and the Ring Fit controller in various ways to perform different actions. (i.e., aiming the controller downward and squeezing to jump). This mode is a mix of all the movements and actions within the game. If the goal is more targeted, for example trunk strength, then choosing either a mini game or workout routine specifically targeting the trunk would be the better option.

Note: each new player can set up their personalized profile in which all of their settings, scores, and stats are saved and tracked so any progress for a given activity can be displayed in some capacity.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: Ring Fit Adventure

Objects and Their Properties Required

Which Platform: Nintendo Switch

Note: Players must wear a leg strap. Time to put on the leg strap will vary based on clients' mobility

Time to Play: A level in adventure ~3-5 minutes, minigames ~2 minutes, rhythm game ~2-3 minutes

Sequencing and Timing

In adventure mode, players jog in place and interact with the ring-con controllers in various ways, to successfully navigate a stage. (i.e. squeezing the ring-con shoots a blast that can knock out enemies, squeezing the ring-con while aimed downward will cause the player to jump, pulling the ring-con apart opens doors.

Outside of adventure mode, there are mini games and exercise routines that are categorized by the muscle groups they target. These will prompt the player to position the ring-con in various ways and perform specific actions. For example, pulling actions to target back muscles. Squeezes to target chest muscles, and squats to target leg muscles.

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions, praxis, cognitive flexibility, insight	X	
Attention: sustained attention and concentration; selective, divided, and shifting attention		This game will challenge all aspects of attention to some degree. Players will need to concentrate in order to match elements on screen in order to perform more efficiently as well as filter out excess stimuli such as environmental effects and visual effects while in adventure mode.
Memory: short-term, working, and long-term memory	X	
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive		Interacting with the ring-controller will challenge the player's tactile discrimination as there are various levels of force required while squeezing and pulling on the ring-con controller. Performing necessary actions will challenge vestibular and proprioceptive ability such as when assuming yoga poses and when lunging and squatting.
Thought: control and content of thought, awareness of reality, logical and coherent thought		The player must have a baseline level of awareness of reality. However, there is no direct challenge to thought. The games are simplistic and there are a lot of prompts (outside of adventure mode when participating in a workout routine).

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Sequencing complex movement: regulating speed, response, quality, and time of motor production		<p>Note: There are degrees of freedom when performing the appropriate actions in game.</p> <p>Adventure mode requires the player to run in place as well as position the arms so that the ring-con points downward or overhead. The player will also squeeze on the ring-con to jump and shoot blasts at enemies. Players pull on the ring-con to interact with doors and other objects.</p> <p>Outside of adventure mode, depending on the activity, this game requires sequencing of movement within the upper arm including shoulder, elbow, wrist, thumb, fingers, trunk, hips, knees, and ankles to effectively play the game. This can be determined by the therapist by choosing an activity that targets the desired muscle group.</p> <p>For example, there is a trunk strength-oriented exercise in which the player places the ring-con against their belly and jog in place. On screen, the character is walking a tightrope with a long balance pole. The player must lean side to side so that the character on screen collects coins with the pole as well as avoid bombs that hurt the character.</p>
Emotional: regulation and range of emotion, appropriateness of emotions		Players maintain an acceptable range of emotions and appropriateness of emotions while essentially exercising which is perceived as an unpleasant experience by many.
Experience of self and time: appropriateness and range of emotion, body image, self-concept		This game does well to promote basic health attitudes and being comfortable with one's own ability. The player's profile is unique to them. As such, they are only competing against themselves.
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful		Complete consciousness is necessary in order to be successful in playing this game.

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
state		
Orientation: orientation to person and self, place, time, and others		<p>Outside of adventure mode, players must be able to orient themselves to the image presented on screen in order to perform the given activity effectively.</p> <p>Such as assuming the proper starting position before performing a given movement. This varies depending on the exercise routine chosen.</p>
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		<p>Exercise is something that not everyone enjoys. However, this game makes engaging in exercise a more fun and engaging experience especially when choosing from the mini games because they gamify the movements required to target the chosen muscle group. (See sequencing of complex movement). However, the player's openness to experience, confidence and motivation will all be challenged to a degree as these are all elements that are inherently present when participating in exercise</p>
Energy and drive: motivation, impulse control, appetite		<p>Can be determined by the therapist This game will require a moderate level of energy to participate in effectively.</p>
<i>Sensory Functions</i>		
Visual: quality of vision, visual acuity, visual stability, visual field		<p>In adventure mode, a player must possess adequate levels of vision to distinguish objects on a screen. Players must possess enough visual acuity to determine where they are on screen as well as identifying targets and enemies as they appear on screen.</p> <p>The same can be said when playing mini games but there is a degree of visual tracking to be effective (i.e. tracking targets and coins on screen) and challenge to the visual field because targets appear anywhere on screen.</p> <p>During exercise routines, possessing enough visual ability to view the prompts on screen (the character's body position) will aid in the player performing the required movement</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		successfully themselves.
Hearing ; sound detection and discrimination; awareness of location and distance of sounds		When in exercise routines, there are audio cues that players can distinguish to aid in performing the movement with the proper tempo. (There is a “coach” that guides the player through the exercise routine).
Vestibular : position, balance, secure movement against gravity		<p>Movements emulated within the game are calisthenic (i.e. squats, pushes, pulls, jogging in place, and core exercises) based around using the ring-con to add interactive elements within the game as well as tactile resistance</p> <p>Player’s vestibular ability will be challenged when performing any of the various movements that the game may prompt from the player.</p> <p>The game even lists when an activity can be completed while seated in which case, seated balance would be challenged. This is the case with a lot of the arm oriented mini games and exercise routines.</p>
Proprioceptive : awareness of body position and space		<p>Players will need to interact with the ring-con in various ways to orient their character on screen to be successful in the game.</p> <p>The player moves in physical space to interact with virtual elements (hitting targets) as they present on screen. Such as when in adventure mode the player jogs in place to move and turns to aim the ring toward enemies then squeezing the ring-con to shoot a projectile to blast the enemies.</p>
Touch : feeling of being touched, touching various textures		Players interact with the ring-con in various ways (i.e. squeezing/pulling in hand, placing on stomach, placing on ankles). Players must also be able to distinguish how much force they are applying to the ring-con when squeezing/pulling. Different amounts of force yields different outcomes depending on the given activity. Such as the distance a projectile will fly, how much power it has, or

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		the speed in which the character on screen moves.
Pain: localized and generalized pain		<p>Clients should be monitored by therapists at all times.</p> <p>Players will need to be able to self-assess their own exertion level and communicate if they are experiencing any pain or excessive discomfort when participating in gameplay.</p>
Temperature and pressure: thermal awareness, sense of force applied to skin		<p>Being able to detect how much force is being applied to the ring-con while it is placed on the user's stomach is applicable to some mini games (see sequencing complex movement) and when participating in trunk exercises in exercise routines.</p> <p>Too much self-applied force could lead to injury or damage to skin.</p>
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility: range of motion		<p>Can be determined by a therapist.</p> <p>Depending on the selected settings/activity, players will be asked to squat, lunge, reach, bend, raise over head, jog in place, and jump</p> <p>Players' relative joint mobility should be able to withstand the required movement of the given activity.</p>
Joint stability: structural integrity of joints		<p>Can be determined by a therapist.</p> <p>Players relative joint stability should be able to withstand the required movement of the given activity see joint mobility.</p>
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction		<p>The player is asked to hold various positions and muscle contraction meant to challenge an individual's endurance</p> <p>This can be graded by the therapist as there are different levels of difficulty for the mini games and exercise routines that change the duration and intensity of the activity. Players must possess enough muscular endurance to</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		<p>participate in a given activity</p> <p>An example of this would be in chest target exercises, the player will be prompted to sustain muscular contraction by maintaining a squeeze against the ring-con. Same with back exercises except the player will be prompted to execute a sustained pull against the ring-con.</p>
<i>Movement Functions</i>		
<p>Involuntary movement reactions: postural, body adjustment, and supporting reactions</p>		<p>The player must have enough postural control to maintain position while performing the required motions of the game (see joint mobility).</p> <p>This game has activities meant to challenge a players postural control such as in-trunk targeting mini games and exercise routines. However even while performing other actions even while seated, the players righting reactions, ability to adjust and postural control will all be challenged to a degree.</p>
<p>Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control</p>		<p>The game requires a significant ability to control voluntary movement eye hand coordination (to perform the movements necessary in a given activity which is dependent on the muscle group target chosen), bilateral integration (squeezing and pulling against the ring-con), gross motor control (performing big body movements such as pushes/pulls with the arms, squats, lunges, and jumps with the legs.) and oculomotor control (searching/tracking enemies, targets, and coins) are all challenged to a degree when playing this game.</p> <p>Each activity has a score that is tracked and each player can have a profile in which scores are tracked. Players compete against themselves as progress is tracked within these profiles.</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Gait patterns: movements used to walk		Players are required to jog in place for some activities. Mostly in adventure mode (as this is how players make the character move along in a level). Jogging in place is also present in some mini games and leg-oriented exercise routines as well. The game does a good job at describing what is required for a given activity.
Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function		
Cardiovascular system: blood pressure, heart rate and rhythm		Depending on the amount of exertion exhibited during gameplay, the cardiovascular system could be challenged for some to a degree. Activities can be graded with difficulty choices.
Respiratory system: rate, rhythm, depth of respiration		Depending on the amount of exertion exhibited during gameplay, the respiratory system could be challenged for some to a degree. Activities can be graded with difficulty choices.
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity		The degree of challenge to physical endurance and stamina depends on the length of the play session and how much motion the player is producing during gameplay (given their ability). Depending on the amount of exertion exhibited during gameplay, additional functions could be challenged for some to a degree, especially when considering length of play sessions, challenge to stamina and aerobic capacity can be graded. The game roughly tracks calories burned and heart rate.
Voice and speech: rhythm and fluency, alternative vocalization functions	X	

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		
Aligns		<p>Can be determined by the therapist.</p> <p>The player's ability to maintain posture without propping is required to effectively play the game. Outside of adventure mode all activities list the muscle groups used during participation. Many can be made to be done seated with a change of settings (i.e. enable knee assist mode).</p>
Stabilizes		Therapists will need to monitor their client as they play, so they do not lose their balance especially while jogging in place and performing lower body movements.
Positions		The player must position themselves within the environment in such a way to provide adequate space to perform actions necessary to play the game, as well as mimic the positions presented on screen in order to be most effective,
Reaches		Various activities will require the player to reach overhead, laterally and out front. Specifically, in activities that target the shoulders and trunk.
Bends		<p>Various activities will require the player to bend in all directions as well as emulate a hula hoop motion. Specifically, those that target the trunk as many of these will prompt the player to bend in all directions.</p> <p>One example is a parachute game in which players hold the ring-con overhead. The direction the player leans determines which direction the player floats as they fall. The objective is to collect as many coins as possible before hitting the ground.</p>
Grips		The player will need to sustain a grip on the ring-con controller at various levels to both push and pull the ring-con.
Manipulates	X	
Coordinates		Depending on the activity the player will be required to coordinate full body movements (see joint mobility).
Moves	X	

SKILL	N/A	Context of Skill Within the Game
Lifts		Some activities require players to lift the ring-con above or behind their head (see bends).
Walks		Players are required to walk/jog in place for some activities. Specifically, in adventure mode and some exercise routines targeting the legs and mini games.
Transports	X	
Calibrates		Players will need to calibrate various movements such as squat depth, pulling force and pushing force in order to achieve higher scores and be successful in game (see touch).
Flows		The better the player is able to flow with a given movement in a given activity, ultimately leads to better outcomes (i.e. higher scores) in game.
Endures		Players perform the activity for the length of time required to complete the activity.
Paces		Some activities require a specific rate and tempo in order to be effectively keeping pace and will translate into higher scores.
<i>Process Skills</i>		
Paces		<p>Sustains pace in given activity to score higher scores.</p> <p>For example, there are activities that prompts players to do as many reps as they can in a given time (i.e. Forcefully squeezing the ring-con and returning to neutral) The player must pace themselves so that they do not exhaust themselves before they even reach the time limit.</p>
Attends		The player must attend to the game until completion in order to be most successful.
Heeds		<p>Can be determined by the therapist.</p> <p>The player completes gameplay under parameters requested by the therapist (execute the required motions as directed by therapist), with desired tempo and ROM.</p>
Chooses		If allowed by the therapist, the player can choose the activity they would like to do or be presented with options to choose from.
Uses		The player uses the ring-con as it is intended.
Handles		The player handles the ring-con as intended.

SKILL	N/A	Context of Skill Within the Game
Inquires		Can be determined by a therapist (asking for clarification on what the game is prompting the player to do). However, this is not required to be successful.
Initiates		Players initiate each movement within each given activity Specifically in exercise routines, players initiate each rep of a given movement when prompted.
Continues		Players continue required motions until the end of the activity.
Sequences		Players need to execute the motions as prompted on screen in order to be successful during gameplay. This can require the recruitment of multiple joints (see joint mobility). Mentally, the player will sequence which targets to go for first in many mini games. The better the player is able to do this, the higher their scores will be.
Terminates		Players terminate certain actions (i.e. squeezing, pulling) at appropriate time to improve outcomes.
Searches/locates		There are three bonus coins placed within each level. Many of these are not obvious. As such players will need to actively search and locate these items.
Gathers	X	
Organizes	X	
Restores	X	
Navigates		In adventure mode, players navigate a level performing the necessary actions (walking/running in place and squeezing/pulling on the ring-con when necessary).
Notices/responds		Players are able to perform the necessary actions to navigate a level without any further prompting in order to complete a level. Outside of adventure modes players could be challenged to perform necessary actions and movements without any extra prompting.
Adjusts		Players are challenged to adjust real world performance of actions (i.e. better form and positioning) to achieve better overall outcomes in games.
Accommodates		Can be determined by a therapist.

SKILL	N/A	Context of Skill Within the Game
Benefits		Can be determined by a therapist.
<i>Social Interaction Skills</i> The therapist can address social interaction skills using the game but this is client specific and thus can be determined by the therapist. Otherwise, social interaction skills are not required to be successful in game.		
Approaches/starts		
Concludes/ disengages		
Produces speech		
Gesticulates		
Speaks fluently		
Turns toward		
Looks		
Places self		
Touches		
Regulates		
Questions		
Replies		
Discloses		
Expresses emotion		
Disagrees		
Thanks		
Transitions		
Times response		
Times duration		
Takes turns		
Matches language		
Clarifies		
Acknowledges and encourages		
Empathizes		
Heeds		
Accommodates		
Benefits		

Areas of Treatment (Application)

Postural control
Balance
ROM
Muscular strength and endurance

Interest Tags

Fitness/Exercise

Nintendo Switch Sports

Nintendo Switch Sports is the reiteration of the classic Wii Sports on current hardware. It has returning sports such as bowling, golf, and tennis; as well as new sports including badminton, chambara (sword fighting), soccer, and volleyball. Similar to Wii Sports, players control their character's movement by physically emulating the motions of the sport they are playing in the game while holding the joy-con (a motion-based controller). Every sport, with the exception of soccer (unless playing with the leg strap which is not included with the game), can be played with one arm. Soccer is played with both arms or one arm and one leg. All sports can be played seated or standing with success.

Switch Sports is good for challenging a patient's functional mobility, range of motion, and coordination particularly in the upper limbs. Lower limb mobility can be challenged while emulating movements for the golf, soccer, and volleyball games (i.e. performed while standing and bending at the knees or twisting at the hips). This also means that Switch Sports can challenge a player's seated or standing balance to a degree. In actuality, very little motion is required from the player to trigger actions in game. However, therapists can grade the amount of motion required from the player during a gameplay session.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: Nintendo Switch Sports (Badminton, Bowling, Chambara, Golf, Soccer, Tennis, & Volleyball)

Objects and Their Properties Required

Which Platform: Switch

Time to Play: 2-5 minutes depending on the sport activity selected.

Sequencing and Timing

Badminton

1. The serving player swings the joy-con controller upward to put the birdie in play
2. Players then volley the ball back and forth motioning their arm with the joy-con in such a way as to mimic forehand, backhand, and spikes until the birdie hits the ground scoring that player a point
3. Play continues until score level is reached

Note: performing appropriate actions (i.e. forehand when the birdie is on the racket side, spike when the birdie is up above and backhand when the birdie is on the non-racket side of the player leads to more powerful hits in game)

Bowling

1. The player positions their character as they desire on the lane using the directional buttons
2. The player bring the joy-con controller up to their chin
3. Presses and holds trigger button to initiate the movement in game
4. The player then emulates a bowling motion swinging the controller back then forward to release the ball toward the pins
5. Repeat steps 1-4 for the remainder of the frame

Chambara

1. The player points the joy-con at the display then presses the top button on the joy-con controller to initiate the start of the round
2. The player then must swing the joy-con perpendicular to how their opponent's sword to land a hit (Note: only applies if the opponent is blocking, if the opponent is not blocking, a hit will land regardless of the direction of the swing)
3. The player must react to their opponent's swings as well by initiating a block by pressing and holding the trigger button and positioning their sword perpendicular to their opponent.
4. The round ends once the health bar of either player fully depletes
5. Repeat steps 1-4 for rounds two and three

Golf

1. The player stands with their non-dominant shoulder facing the display
2. The player then points the joy-con down at the ground and presses the top button to initiate practice swings
3. The player can aim their shot using the left and right buttons on the joy-con
4. The player initiates their actual shot by pressing and holding the trigger button on the controller
5. The player then swings the joy-con back until they reach the desired level of power
6. The player then swings downward to strike the ball.
7. Repeat steps 1-6 until all holes are completed

Tennis

1. The serving player swings the joy-con controller upward then downward when the ball is at its peak to put the ball in play
2. Players then volley the ball back and forth motioning their arm with the joy-con in such a way as to mimic forehand, backhand, and spikes until the ball bounces twice on the opposing side of the net scoring that player a point
3. Repeat play until the predetermined score total is reached
4. Note: performing appropriate actions (i.e. forehand when the ball is on the racket side, spike when the ball is up above and backhand when the ball is on the non-racket side of the player leads to more powerful hits in game

Volleyball

1. The serving player swings the joy-con controller upward then downward when the ball is at its peak to put the ball in play
2. Players then volley the ball back and forth (Note: the game automatically alternates

- players cueing them for the appropriate hits bump set spike.)
3. Depending on the timing of the player in performing the designated hit determines the quality of the strike
 4. Rally continues until the ball hits the floor scoring the player on the opposite side of the net a point.
 5. Repeat play until the predetermined score total is reached

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions, praxis, cognitive flexibility, insight	X	
Attention: sustained attention and concentration; selective, divided, and shifting attention		<p>The player must sustain attention during gameplay in order to be successful during gameplay.</p> <p>This is especially the case when participating in tennis, volleyball, badminton, soccer and chambira as these have an active opponent in which the player must react to.</p>
Memory: short-term, working, and long-term memory	X	
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive		<p>Performing the necessary actions will challenge vestibular and proprioceptive ability.</p> <p>Essentially, the player uses the joy-con controller to mimic the motions in a given sport (i.e. swinging a golf club, swinging a tennis racket, spiking a volleyball, or bowling a bowling ball etc...).</p> <p>The therapist or player can decide how intentional and realistic these movements need to be during gameplay (actions can actually be triggered with very little required motion).</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Thought: control and content of thought, awareness of reality, logical and coherent thought		<p>The player must have a baseline level of awareness of reality.</p> <p>But there is no direct challenge to thought. The games are simplistic and there are a lot of prompts.</p>
Sequencing complex movement: regulating speed, response, quality, and time of motor production		<p>Note: there are degrees of freedom to perform the appropriate action in game.</p> <p>This game requires sequencing of movement within the upper arm including shoulder, elbow, wrist, thumb, and fingers to effectively play the game.</p> <p>Trunk movement can be incorporated as well in order to more realistically simulate the movements of the various sports (i.e. swinging a golf club, swinging a tennis racket, spiking a volleyball, or bowling a bowling ball etc...)</p> <p>Lower extremity motion can be challenged while playing soccer (or any other sport if played while standing but this is not required).</p> <p>Note: Soccer requires the leg strap that is not included with the game if the goal is to play as it was intended. This is how to get the legs most involved in the activity.</p>
Emotional: regulation and range of emotion, appropriateness of emotions		<p>It is assumed some might easily be caught in the emotion of the game as it is competitive.</p> <p>The player must demonstrate a degree of emotional regulation in this case.</p>
Experience of self and time: appropriateness and range of emotion, body image, self-concept		<p>Players can choose to create a “sportsmate” that is then used during gameplay. They can make themselves or anyone else they choose.</p>
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful		<p>Complete consciousness is necessary in order to be successful in playing this game.</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
state		
Orientation: orientation to person and self, place, time, and others	X	
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		<p>Can be determined by the therapist.</p> <p>When playing vs other people, a degree of conscientiousness is necessary.</p> <p>Agreeableness, and conscientiousness; emotional stability; self-expression, confidence, motivation, self-control and impulse are all elements that can be challenged to a degree as these are all involved in some way when there is competition. (See emotional).</p>
Energy and drive: motivation, impulse control, appetite		<p>At minimum, the player must exhibit enough energy and motivation to move at least one upper extremity for 5/6 sports and use both upper extremities to effectively play soccer (soccer can be played with upper extremities alone but it requires both).</p>
<i>Sensory Functions</i>		
Visual: quality of vision, visual acuity, visual stability, visual field		<p>The player must have enough visual ability to perceive elements on the screen and where they are on screen as well as be able to track objects such as the ball when playing tennis and badminton.</p>
Hearing; sound detection and discrimination; awareness of location and distance of sounds	X	
Vestibular: position, balance, secure movement against gravity		<p>Can be determined by the therapist.</p> <p>Emulated motions of various sport activities are utilized to interact within the game (i.e. Swing a golf club or tennis racket).</p> <p>This can be graded up or down (i.e. performed seated or standing or on a dynamic surface). Standing is recommended while playing golf.</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		<p>A leg strap can be implemented when playing soccer requiring the player to maintain balance while kicking.</p> <p>Note: leg strap not self-tested by the one conducting this analysis but was observed on video</p>
Proprioceptive: awareness of body position and space		<p>At minimum, the player must be able to grip a joy-con controller with one hand in 5/6 activities, soccer requires both hands to hold a joy-con. They must also be able perceive their body in space to determine where their limbs are in space and if they have enough room to perform the necessary emulated sports movements</p>
Touch: feeling of being touched, touching various textures		<p>The game requires the use of a controller. The player must physically interact with the input devices in order to play the game. Players must be able to tell if they holding the controller and or if they are hitting the desired inputs (triggers vs buttons vs joysticks) and if they are interacting with the joystick in the desired manner (orienting to the desired direction) and not pressing down with excessive force as this actuates another input L3 & R3 which can lead to unintended actions if the player did not mean to press those inputs.</p>
Pain: localized and generalized pain	X	
Temperature and pressure: thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility: range of motion		<p>At minimum, the player must be able to minimally flex their shoulder, elbow and minimally flex extend radially deviate, and ulnarly deviate their wrist depending on the sport selected.</p> <p>Full/Exact execution of the simulated sport movement is not required to be successful in</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		<p>any of the activities but is encouraged based on client ability for best results.</p> <p>The degree to which this is challenged can be done is determined by the therapist.</p>
Joint stability: structural integrity of joints		At minimum, the player must be able to sustain structural stability while performing the motions described above (see joint mobility).
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction		
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting reactions		<p>The player must have enough postural control to maintain position while performing the required motions of the game (see joint mobility)</p> <p>The degree required can be determined by the therapist</p>
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		<p>The game requires a significant ability to control voluntary movement, eye hand coordination, bilateral integration, gross motor control and oculomotor control, are all challenged to a degree when playing this game.</p> <p>The simpler sport activities are bowling and tennis. The harder activities are golf and chambira</p> <p>An example would be tennis where the player must exhibit hand eye coordination to time their swing as the ball approaches. Executing a swing effectively requires a degree of gross motor function in the upper extremity. A full ROM swing will require the player to cross midline. Oculomotor control is utilized when tracking the ball as it approaches the player.</p> <p>Bilateral integration is present in soccer, as at</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		least two extremities are required to play (Both upper extremities or one upper extremity and one leg). Bilateral integration can be utilized in sports such as volleyball and golf if players simulate the motions required as realistic as possible.
Gait patterns: movements used to walk	x	
<i>Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function</i>		
Cardiovascular system: blood pressure, heart rate and rhythm		Depending on the amount of exertion exhibited during gameplay, the cardiovascular system could be challenged for some to a degree
Respiratory system: rate, rhythm, depth of respiration		Depending on the amount of exertion exhibited during gameplay, the respiratory system could be challenged for some to a degree
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity		<p>The degree of challenge to physical endurance and stamina depends on the length of the play session and how much motion the player is producing during gameplay (given their ability)</p> <p>When performing fully emulated sports actions, a minimal-moderate level of stamina is required from an average individual</p> <p>Depending on the amount of exertion exhibited during gameplay, additional functions could be challenged for some to a degree, especially when considering length of play sessions, challenge to stamina and aerobic capacity can be graded</p>
Voice and speech: rhythm and fluency, alternative vocalization functions		<p>Can be determined by the therapist</p> <p>But is not required to be successful.</p>

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		
Aligns		Can be determined by the therapist.

SKILL	N/A	Context of Skill Within the Game
		<p>Ability to maintain posture without propping is required to effectively play the game. Under ideal circumstances both hands are used in each sport activity excluding tennis, badminton, and soccer (if using the leg strap). The use of both hands is not required for successful gameplay except for soccer.</p>
Stabilizes		<p>Can be determined by the therapist.</p>
Positions		<p>The player must position themselves in such a way in relation to the display so that they are able to view the entire display without the elements on screen being too small for them to see. They must position their body as well as limbs, wrists, hands, and fingers in a way that is comfortable and enables them to best endure the duration of the play session and sustain postural control.</p> <p>The player must also position themselves within the environment in such a way to provide adequate space to perform actions necessary to play the game.</p>
Reaches		<p>Reaching is especially prevalent in the badminton and tennis sport activities as it is required to reach upward, emulating a spike, to produce the most power in game.</p>
Bends		<p>This is not required to be successful, but can be used when emulating golf or volleyball.</p>
Grips		<p>Players must be able to maintain grip of joy-con controllers, ideally in both hands.</p>
Manipulates		<p>Interacting with the input device of choice requires a degree of manipulation.</p>
Coordinates		<p>Can be determined by the therapist.</p> <p>This game necessitates the ability to coordinate upper limb movement to be effective at playing the game in order to simulate actions such as swinging a golf club, swinging a tennis racket, spiking a volleyball, or bowling a bowling ball etc.</p> <p>Lower limb coordination can be challenged when using the leg strap during the soccer activity.</p>

SKILL	N/A	Context of Skill Within the Game
		Trunk motion can be incorporated in activities such as golf and volleyball but is not required to successfully engage with the game.
Moves	X	
Lifts		Lifting the joy-con controller is required to perform simulated sport actions.
Walks	X	
Transports	X	
Calibrates		<p>Can be determined by a therapist.</p> <p>It takes very little motion to actually execute an action within the game. However, this can be graded up (i.e. fully simulating sport actions) thus requiring a higher level of calibration.</p> <p>An exception to this is golf where the player determines the power of their swing based on the amount of backswing and the force of the downswing thus necessitating the ability to calibrate.</p>
Flows		Actions must be smooth and deliberate to be effective during gameplay. Actions may not register properly if they are not deliberate and smooth.
Endures		<p>The player must endure postural control and hand and finger movements for the duration of the gameplay session or until they reach a suitable stopping point.</p> <p>The player must be able to repeatedly perform required actions in order to be successful (i.e. sustaining a rally in tennis or volleyball).</p>
Paces		<p>Can be determined by the therapist.</p> <p>The player must maintain the same rate and tempo throughout the duration of the sport activity.</p>
<i>Process Skills</i>		
Paces		Unique actions require a degree of timing and tempo to execute successfully (serving in tennis, badminton and volleyball, also when bowling).
Attends		<p>The player must sustain attention during gameplay in order to be successful during gameplay.</p> <p>This is especially the case when participating in tennis, volleyball, badminton, soccer and chambira</p>

SKILL	N/A	Context of Skill Within the Game
		as these have an active opponent in which the player must react to.
Heeds		<p>Can be determined by the therapist.</p> <p>The player completes gameplay under parameters requested by the therapist (execute the sport motions as directed by therapist).</p>
Chooses		Players have the freedom to choose which sport they want to play or be provided options from the therapist.
Uses		The player must use the joy-con controllers as they are intended.
Handles		Player must hold joy-cons in the requested manner.
Inquires		Can be determined by the therapist (i.e. the player asking questions on how to play and reminders on what to do next in gameplay).
Initiates		<p>The must initiate multiple actions fluidly in order to be effective during gameplay in some sport activities such as chambara (engaging blocking, and swinging the sword) badminton (initiating serves and swinging), tennis (initiating serves and swinging, volleyball (initiating serves, bumps sets and spikes) and soccer (initiating kickoff).</p> <p>Other sport activities are more segmented (i.e. golf and bowling) however, players initiate their swing in golf and initiate their approach when bowling.</p>
Continues		<p>The player continues respective sport actions until the end of the gameplay. Especially prevalent in tennis, volleyball, and badminton because at times there can be long volleys in which the player must continue batting the ball back to their opponent.</p> <p>Similarly, in chambara, players continue striking and blocking until someone is knocked off the platform.</p>
Sequences		<p>Golf and bowling require that buttons be pressed in a certain sequence before the player can initiate the required motion.</p> <p>Other sport activities such as chambara and soccer require the player to react to their opponent. In chambara the play must block as well as attack and in soccer the player must move their character to the ball before swinging to kick.</p>

SKILL	N/A	Context of Skill Within the Game
Terminates		Sport activities such as golf and bowling have a distinct stop and reset. The player must recognize that they do not need to swing multiple times in these particular sports.
Searches/locates	X	
Gathers	X	
Restores	X	
Navigates	X	
Notices/responds		Players instinctively react and take actions necessary during gameplay without external prompting. Such as when playing tennis, badminton, chambira, and soccer.
Adjusts	X	
Accommodates		Can be determined by the therapist. This is client specific.
Benefits		Can be determined by the therapist. This is client specific.
<i>Social Interaction Skills</i> The game has multiplayer in which case the therapist my want to work on some social skills depending on the goals for the client however these are client specific and can be determined by the therapist. Otherwise, they are not required to be successful in game.		
Approaches/starts		
Concludes/ disengages		
Produces speech		
Gesticulates		
Speaks fluently		
Turns toward		
Looks		
Places self		
Touches		Can be determined by the therapist (appropriate touching). This may be present but not required to be successful.
Regulates		
Questions		
Replies		
Discloses		
Expresses emotion		
Disagrees		
Thanks		
Transitions		
Times response		

SKILL	N/A	Context of Skill Within the Game
Times duration		
Takes turns		Taking turns can be made present in bowling and in golf. Players share one joy-con and pass it between each other when it is their turn.
Matches language		
Clarifies		
Acknowledges and encourages		
Empathizes		
Heeds		
Accommodates		
Benefits		

Areas of Treatment (Application)

Postural control

Balance

ROM

Muscular strength and endurance

Coordination

Interest Tags

Sports

Cuphead

Cuphead is an intentionally difficult game that often challenges a player's emotional regulation skills given how often failure is experienced in the game. Players are constantly facing dangers like copious amounts of enemies, projectiles, and the inherent structure of each game stage itself. Players will need to exhibit adequate precision and reaction time in their fine motor movements, while providing game input, in order to be successful in navigating the various stages and surviving boss battles. There is often a substantial amount of visual and auditory stimuli on the screen at once which requires the player to maintain focus on important stimuli and filter out any irrelevant stimuli in a given scenario (i.e., ignoring enemies and projectiles that are too far away to cause damage, and focusing on the immediate threats in close proximity).

This game is particularly useful from a therapeutic potential standpoint when it comes to addressing working and short-term memory. The design of each stage always remains the same; all challenging components including exact enemy placement, the number of enemies, and other stage elements are always presented in the same exact manner, regardless of how many times the player has attempted a particular stage. When a player dies (by losing all health or falling off the stage platform), they must restart from the beginning of that stage or boss fight. Even bosses provide the same attacks, unique animations, and often audio cues that remain consistent per boss. The unique animations and audio cues let the player know which attack is about to occur. Players are challenged to memorize the exact placements of enemies and order of enemy attacks as they appear in a level or boss fight, as being prepared for what is to come is the best way to achieve success in the stage.

The game can also be played cooperatively with another player. However, each player has their own separate health meter, and therefore do not need to work together or worry about what the other player is doing. Despite this, the game is made somewhat easier while playing cooperatively with a partner, because both players have to die before the level restarts. Additionally, there are opportunities to be revived if one player dies while the other is still alive.

Note: Any previously beaten levels can be revisited and replayed, including boss fights.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: Cuphead

Objects and Their Properties Required

Which Platform: Xbox PC Switch

Time to Play: Stages generally take 5-10 minutes to complete. Can take longer depending on skill level

Sequencing and Timing

In world levels

1. Players choose a level.
2. Players navigate the side scrolling level by eliminating enemies and traversing pitfalls with jumps and dashes.
3. Players can collect three coins hidden throughout the level as they progress. These used to purchase character upgrades from the shop.
4. Once the end of the level is reached the level is cleared.
5. If the player loses all their hearts by taking damage (the default is three hearts) or falls into a pitfall, the player must restart at the beginning of the level losing all progress from the previous run.

In Boss levels

1. During boss levels the player must deal enough damage to deplete the bosses health bar to zero
2. Players must do this without taking too much damage losing all of their hearts (the default is three hearts) otherwise they will need to restart the battle from the beginning.
3. The boss has the same attack animations that the player can see in on to know what is coming. However, the boss will add more or different attacks once different stages of the fight are reached. This is usually determined by the amount of health the boss has.
4. Players clear the level once they deplete the boss's health to zero.

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions, praxis, cognitive flexibility, insight	X	
Attention: sustained attention and concentration; selective,		This game will challenge sustained attention, concentration, and shifting attention.

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
divided, and shifting attention		<p>If the player is unable to display the above skills to a degree, the player will have an increased rate of failure.</p> <p>The game has a constant flow of threats to the player coming at any given time (enemies, projectiles and the stage itself because of hazards and gaps). The player must be able to readily identify these threats and react in such a way to preserve their life in game and make progress. All progress is lost once all hearts are lost and the player must start the level over from the beginning.</p>
Memory: short-term, working, and long-term memory		<p>This game challenges short term and working memory. Each stage has its set elements (i.e. platforms and enemies positioned in the same locations). Through trial and error, the player learns/recalls/memorizes the stage in order to make progress through the stage, eventually conquering that one stage leading to the next in which the process begins again.</p> <p>Even during boss battles, the boss uses the same attacks, not necessarily in the same sequence, but each individual attack has a unique animation meant to telegraph to the player which attack is about to occur. The player will learn and remember the bosses' attack patterns and animations to eventually prevail.</p>
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive	X	
Thought: control and content of thought, awareness of reality, logical and coherent thought		Players will be challenged to logically reason how to progress through levels and take down bosses. The bosses have patterns to their attacks that once identified, can clue the player in on how to beat them.
Sequencing complex movement: regulating		In order to make progress in game, gameplay necessitates that players perfect timing of

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
speed, response, quality, and time of motor production		movements (i.e. jumps, dodges, and shooting) in conjunction with locations of moving elements (i.e. enemies and platforms). For this to be accomplished the player's ability to regulate the speed in which they provide input to the controller, response time, and time of motor production will all be challenged to a degree.
Emotional: regulation and range of emotion, appropriateness of emotions		<p>Failure is inevitable when playing this game as it requires trial and error to progress. The game's timings (jumps and dodge windows) can be very unforgiving. On top of navigating the stage, the player must contend with a steady stream of enemies that makes navigating the stage that much more complex. The player starts with three hearts (more can be added with power ups). The player loses a heart each time they come into contact with an enemy. Each time the player dies (losing their hearts or falling off the stage), they must start from the beginning of that stage. This in itself can be a frustrating experience, because any progress the player made previously is gone and they must repeat the same progression over again. Progress is meant to be slow; the reward of the game is the feeling of accomplishment after beating a level that was once viewed as unconquerable. The challenge the player faces continues to rise as they progress through the levels, meaning players will continually be met with frustration and fulfillment.</p> <p>Players must be able to control any emotions that arise during gameplay particularly when being faced with a challenge that is frustrating.</p>
Experience of self and time: appropriateness and range of emotion, body image, self-concept	X	
Global Mental Functions		
Consciousness: awareness		Complete consciousness is necessary in order

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
and alertness, clarity and continuity of the wakeful state		to be successful in playing this game.
Orientation: orientation to person and self, place, time, and others	X	
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		Failure is a frequent occurrence in this game as it is about trial and error. A player must sustain their motivation and confidence in order to persevere through the stages.
Energy and drive: motivation, impulse control, appetite	X	This is not an actively demanding game. It is mentally demanding.
<i>Sensory Functions</i>		
Visual: quality of vision, visual acuity, visual stability, visual field		A player must possess adequate levels of vision to distinguish objects on a screen. Players must possess enough visual acuity to determine where they are on screen as well as identify any enemies present and or obstacles to navigate through. At any given time there can be a lot of visual stimuli on screen. (i.e. number of enemies, shifting platforms and shifting backgrounds as well as what the player is doing (shooting anything from little balls of energy to full on laser beams). This will challenge the player's ability to filter out excessive stimuli and attend to the important stimuli as well as visually track any moving elements at a given time.
Hearing; sound detection and discrimination; awareness of location and distance of sounds		During boss battles there are often audio cues that accompany the animations that telegraph the bosses attacks to the player.
Vestibular: position, balance, secure movement	X	

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
against gravity		
Proprioceptive: awareness of body position and space	X	
Touch: feeling of being touched, touching various textures		The game requires the use of a controller (or optionally mouse and keyboard if playing on PC) that the player must physically interact with. Players must be able to tell they are holding the controller and or if they are hitting the desired inputs (triggers vs buttons vs joystick) and if they are interacting with the joystick in the desired manner (orienting to the desired direction and not pressing down with excessive force as this actuates another input L3 & R3 which can lead to unintended actions if the player did not mean to press those inputs.
Pain: localized and generalized pain	X	
Temperature and pressure: thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility: range of motion		A player must have at minimum enough joint mobility in the hands and fingers to interact with the input device. The game requires rapid button presses as well as timely responses on specific inputs (i.e. jumping and dodging) in order to be successful thus challenging the player's ROM and precision of the hand, finger and thumb joints.
Joint stability: structural integrity of joints	X	
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction	X	
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting		Can be determined by the therapist. Normally, a player would participate in

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
reactions		gameplay from a seated position. Requiring them to sustain postural control in that way.
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		The game has elements that the player must visually track (i.e. moving platforms, enemies, and incoming enemy projectiles). This will challenge the player's oculomotor control. The player also needs to make accurate and timely responses to these elements as they occur on screen (dodging enemy attacks, jumping over projectiles, timing jumps to successfully traverse gaps). Thus, challenging hand eye coordination and fine motor control to a degree. The player normally uses two hands to interact with the input device.
Gait patterns: movements used to walk	X	
<i>Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function</i>		
Cardiovascular system: blood pressure, heart rate and rhythm	X	
Respiratory system: rate, rhythm, depth of respiration	X	
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity	X	
Voice and speech: rhythm and fluency, alternative vocalization functions		During cooperative gameplay, players should communicate, vocalizing information to each other. Players will need to use speech to relay information if playing as intended. But this is not specifically required to be successful.

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		

SKILL	N/A	Context of Skill Within the Game
Aligns		Can be determined by the therapist.
Stabilizes		Can be determined by the therapist.
Positions		<p>Can be determined by the therapist.</p> <p>The player must position themselves in such a way in relation to the display, so that they are able to view the entire display without the elements on screen being too small for them to see. They must position their body as well as limbs, wrists, hands, and fingers in a way that is comfortable and enables them to best endure the duration of the play session and sustain postural control.</p> <p>In game: players need to position their character effectively to be successful in game (i.e. position on platforms, aiming shots, ducking).</p>
Reaches	X	
Bends	X	
Grips	X	
Manipulates		Interacting with the input device of choice requires a degree of manipulation.
Coordinates		Normally, the player used both hands to interact with the input device.
Moves	X	
Lifts	X	
Walks	X	
Transports	X	
Calibrates	X	
Flows	X	
Endures		The player must endure postural control and hand and finger movements for the duration of the gameplay session or until they reach a suitable stopping point. The player may not always be able to stop and pause the game, especially during the faster paced levels. Attempting to pause or if they become too fatigued to finish a level in one sitting, will cause them to be killed by an enemy and lose their progress.
Paces		The player will be challenged to provide inputs in a pace that keeps up with the level they are presently in. Failure to keep pace will cause them to take damage and eventually cause them to have to start over.
<i>Process Skills</i>		

SKILL	N/A	Context of Skill Within the Game
Paces		Players will be challenged to mentally keep pace with the level they are presently at. Players will need to process and react to the stimuli presented on screen in order to be successful during gameplay.
Attends		A player must attend to the game throughout the length of the gameplay session, otherwise there will be an increased rate of failure.
Heeds		Can be determined by a therapist. Beating certain levels or following instructions to beat a boss.
Chooses		There is a shop that players can visit that as players make progress through the game, will supply the player with power ups they can choose from, as there is no set order in selection.
Uses		Players use input devices as they are intended
Handles		Players handle input devices as they are intended
Inquires		Can be determined by the therapist (i.e. the player asking questions on how to complete a stage).
Initiates		Players are challenged to take the appropriate actions (i.e. jump, dodge, duck, shoot etc.) at the appropriate times in order to be successful. This all depends on the context of the game at the time (i.e. how much health does the player have, how far into the stage the player is, how many enemies there are etc.) which means that the game requires sound judgment from the player or else it will lead to frequent failures.
Continues		The player continues to navigate through stages for the duration of the gameplay session or once the desired number of stages are complete. In boss battles, players continue following the pattern until the battle is over.
Sequences		In game: the player has to sequence how to navigate through stages using a series of jumps and dashes as well as special abilities in some cases.
Terminates	X	
Searches/locates		There are three bonus coins placed within each level. Many of these are not obvious. As such players will need to actively search and locate these items.

SKILL	N/A	Context of Skill Within the Game
		This also applies to any health or other in game item drops.
Gathers	X	
Organizes	X	
Restores	X	
Navigates		<p>Players must determine how to navigate through game level layouts - as the path toward completion is typically linear. Therefore, if players are unable to determine which direction they came from, they can easily get lost.</p> <p>In game: the player has to sequence how to navigate through stages using a series of jumps and dashes as well as special abilities in some cases using specific items obtained during gameplay.</p>
Notices/responds		Players are able to recognize the pattern in the levels and boss battles and respond in order to progress further in levels or complete levels.
Adjusts		The player is challenged to adjust their gameplay for mistakes rather than repeating the same mistake frequently.
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.
<i>Social Skills</i> The therapist can address social interaction skills using the game but this is client specific and thus can be determined by the therapist. Social skills can be addressed while playing cooperatively but is not otherwise required to be successful		
Approaches/starts		Players start relaying necessary information to each other.
Concludes/disengages	X	
Produces speech		<p>Players should produce speech to communicate with each other in order to be most successful.</p> <p>However, this is not specifically required to be successful.</p>
Gesticulates		Can be used to communicate if players are playing in the same space.
Speaks fluently		Players speak in a way that both players can understand.
Turns toward	X	
Looks	X	
Places self	X	

SKILL	N/A	Context of Skill Within the Game
Touches		Can be determined by the therapist (appropriate touching). May be present but not required to be successful.
Regulates		Players are able to remain focused on information relevant to the game.
Questions		Players are able to ask for appropriate clarifying information, when necessary, amongst each other or from the therapist. (i.e. What did you want me to do? How do I do X again, or how do I dodge X attack? etc...).
Replies		Players continue relaying necessary information, responding accordingly when necessary. Thus, leading to better coordination and cooperation during gameplay.
Discloses	X	
Expresses emotion		Can be determined by the therapist. Players appropriately express their own emotions and their emotions toward one another such as when one player messes up causing both to fail.
Disagrees		Players may need to appropriately express their differing opinions such as when discussing strategy on how to beat a level.
Thanks		May be present but not required to be successful.
Transitions	X	
Times response		Players respond to each other in a timely manner. Failure to respond in a timely manner can cause either player to make unnecessary mistakes due to the fast-paced nature of the game, information needs to be communicated quickly and efficiently
Times duration		Players respond to each other in a timely manner. Failure to relay information in a timely manner can cause either player to make unnecessary mistakes due to the fast-paced nature of the game, information needs to be communicated quickly and efficiently
Takes turns	X	
Matches language		May be present but not required to be successful.
Clarifies		Players are able to clarify what they are attempting to communicate to the other player or therapist when necessary or when asked. Such as the gameplay strategy idea they may have or when they recognize a pattern in a given boss battle.

SKILL	N/A	Context of Skill Within the Game
Acknowledges and encourages		Players are able to acknowledge each other's frustrations when present as it is a challenging game and are able to appropriately encourage each other when necessary.
Empathizes		May be present but not required to be successful. Players are able to recognize the emotions the other is feeling such as when getting frustrated and able to understand why they are feeling that way.
Heeds		Players heed to the others instructions when appropriate and able to communicate effectively and coordinate actions cooperatively in order to be successful in beating levels.
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.

Areas of Treatment (Application)

Cooperation
Emotional regulation
Memory
Reaction time

Interest Tags

Disney art style

Death Squared

Death Squared is a puzzle game that can either be played by a single player or cooperatively with another player. From a therapeutic perspective, there are many aspects of the game that challenge a player's cognitive and process skills, including attention, problem-solving, and memory. There are also some physical skills that could be addressed with this game such as fine motor ability and the time and quality of motor production within the hands and fingers. When this game is played cooperatively, social skills can potentially be addressed, as both players must work together in order to beat various stages of the game and progress further. The social skill that could benefit most from this game is emotional regulation. This is because players will fail numerous times, slowly making progress on a given stage until it is eventually beaten. This experience could be frustrating for some and will require players who are easily frustrated to regulate their emotions.

Despite these other areas, this game provides the strongest therapeutic potential in addressing cognitive and process skills. Success in the game requires a great deal of focus, higher-level thinking, and problem solving in order to successfully complete the puzzles. Players become further challenged in these areas as they progress to later levels. Players get a break from maintaining focus in instances where the robots in the game are not moving. However, many levels have elements that move as the robots move, including platforms, walls, and lasers. Memory can be challenged to some degree especially in levels that contain hidden spikes as the player will be required to remember where the spikes are. Navigating a level safely requires a degree of problem-solving ability as well as the ability to think logically and coherently.

Note: Any previously beaten stages can be replayed indefinitely which is good for repeatability.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: Death Squared

Objects and Their Properties Required

Which Platform: PC and all consoles

Time to Play: No preset time but early stages can take as little as a few seconds and mid to late stages can take a few minutes

Sequencing and Timing

1. Stage Start
2. Player navigates red robot using Left stick or WASD & navigates the blue robot using Right stick to reach respective colored rings

3. (Stage dependent) – player must interact with various elements (i.e. switches, walls, lasers, platforms) in an appropriate manner/sequence to successfully complete the stage.

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions, praxis, cognitive flexibility, insight	X	
Attention: sustained attention and concentration; selective, divided, and shifting attention		<p>There are multiple elements that must be focused on at a given time in order to solve a puzzle, especially shifting and divided attention, as actions from one robot will affect the other in real time.</p> <p>The degree to which this is challenged increases as progress is made through the stages.</p> <p>The degree of challenge can further be amplified if playing single player because then the player is responsible for controlling both robots at the same time. Controlling one with each joystick of a controller or arrow keys and WASD respectively.</p>
Memory: short-term, working, and long-term memory		<p>At times there are elements that appear on a stage when a switch is activated (e.g. spikes). The player must remember where these appear in order to avoid failing because it is not always possible to keep these elements revealed while navigating/completing the stage.</p>
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive	X	
Thought: control and content of thought, awareness of reality, logical and coherent		<p>Each stage has a logical solution that must be discovered by the player. In order to be successful, the player must be able to think logically.</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
thought		The degree to which this is challenged increases as progress is made through the stages.
Sequencing complex movement: regulating speed, response, quality, and time of motor production		<p>Regulating speed and quality of motor production are skills that are challenged with this game.</p> <p>The most common ways to die are accidentally touching spikes and falling off the stage itself. To counter this, precise movements are necessary in order to navigate the stage, crossing tight spaces or dodging hazards (i.e. lasers).</p> <p>If a player has difficulty regulating motor production and quality, it will be more challenging to synchronize the movements between the two robots necessary to complete the stage. Frequently, the actions of one robot influence the other.</p>
Emotional: regulation and range of emotion, appropriateness of emotions	X	<p>Failure is inevitable when playing this game as it requires trial and error to progress. Which can be a frustrating experience on its own.</p> <p>The game's stages can be unforgiving, requiring precise movement. On top of that, if playing alone, the player is responsible for two robots at once. Adding yet another element that adds to potential frustration.</p> <p>The player must be able to control any emotions that arise during gameplay.</p>
Experience of self and time: appropriateness and range of emotion, body image, self-concept	X	
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful state		Complete consciousness is necessary in order to be successful in playing this game.

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Orientation: orientation to person and self, place, time, and others		<p>In game: there are times when one player's actions affect the other. In these cases, the player must be able to orient their robot to the others in order to be successful.</p> <p>For example, one robot's movements control a platform that the other needs to get on. So, the two robots need to sync up their movements so that they can navigate successfully.</p>
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		<p>If the player is playing cooperatively, then there is a degree of agreeableness and conscientiousness necessary in order to work together to complete stages.</p> <p>Failure is a frequent occurrence in this game as it is about trial and error. A player must sustain their motivation in order to persevere through the stages.</p> <p>Self-control and impulse control are tested during cooperative play as there are times where one player's fate is determined by the other. It can be fun to doom the other player to fail but if the goal is to complete stages, then a player must be able to exhibit self-control and impulse control.</p>
Energy and drive: motivation, impulse control, appetite		This is not an actively demanding game. It is mentally demanding.
<i>Sensory Functions</i>		
Visual: quality of vision, visual acuity, visual stability, visual field		<p>A player must be able to distinguish between the robots. This can be made easier through the use of individualized hats in color blind cases. As well as toggle a color-blind friendly setting in the menus.</p> <p>A player must possess adequate levels of vision to distinguish objects on a screen but there is no direct challenge of vision within the game as well as identifying any obstacles to navigate through or any useful elements such as switches.</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Hearing ; sound detection and discrimination; awareness of location and distance of sounds		Auditory sounds are made when activating switches and there is light hearted banter from the narrator (subtitles available) but they are not necessary for a player to play the game.
Vestibular : position, balance, secure movement against gravity	X	
Proprioceptive : awareness of body position and space		In game: the player must be aware of where their robot(s) are positioned on the stage at all times in order to be successful.
Touch : feeling of being touched, touching various textures		The game requires the use of a controller (or optionally, a keyboard if playing on PC). The player must physically interact with these input devices in order to play the game. Players must be able to tell if they holding the controller and or if they are hitting the desired inputs (triggers vs buttons vs joysticks) and if they are interacting with the joystick in the desired manner (orienting to the desired direction) and not pressing down with excessive force as this actuates another input L3 & R3 which can lead to unintended actions if the player did not mean to press those inputs.
Pain : localized and generalized pain	X	
Temperature and pressure : thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility : range of motion		A player must have at minimum enough joint mobility in the hands and fingers to interact with the input device. This challenges the player's ROM and precision of the hand finger and thumb joints. The game is slow paced allowing players to move at their own pace. In most cases, when the player stops moving all stage elements stop as well.
Joint stability : structural	X	

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
integrity of joints		
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction	X	
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting reactions		Can be determined by the therapist. Normally, a player would participate in gameplay from a seated position. Requiring them to sustain postural control in that way.
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		A player must be able to finely adjust their robot's positioning at times in order to complete stages (i.e. precise movement of a joystick). When playing single player, the player is responsible for controlling both robots; one on each joystick (or WASD and Arrow keys with keyboard and mouse). Thus, requiring a degree of bilateral integration on top of fine motor control.
Gait patterns: movements used to walk	X	
<i>Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function</i>		
Cardiovascular system: blood pressure, heart rate and rhythm	X	
Respiratory system: rate, rhythm, depth of respiration	X	
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity	X	
Voice and speech: rhythm and fluency, alternative vocalization functions		Can be determined by the therapist. If playing cooperatively, vocally communicating with other players can be challenged to a certain degree. Vocalizing information to each other. Players will need to use speech to relay information if playing

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		as intended

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		
Aligns		Can be determined by the therapist.
Stabilizes		Can be determined by the therapist.
Positions		<p>Can be determined by the therapist.</p> <p>The player must position themselves in such a way in relation to the display so that they are able to view the entire display without the elements on screen being too small for them to see. They must position their body as well as limbs, wrists, hands, and fingers in a way that is comfortable and enables them to best endure the duration of the play session and sustain postural control.</p> <p>In game: players need to position their character effectively to be successful in game (i.e. position on platforms navigating stages).</p>
Reaches	X	
Bends	X	
Grips	X	
Manipulates		Interacting with the input device of choice requires a degree of manipulation.
Coordinates		Normally, the player used both hands to interact with the input device.
Moves	X	
Lifts	X	
Walks	X	
Transports	X	
Calibrates		<p>The speed at which the player makes inputs on the controller can affect overall outcomes.</p> <p>Meaning if the player frantically presses buttons or tries to rush that could lead to more failure and make it difficult to coordinate with the other robot.</p>
Flows	X	

SKILL	N/A	Context of Skill Within the Game
Endures		The player must endure postural control and hand and finger movements for the duration of the gameplay session or until they reach a suitable stopping point.
Paces	X	
<i>Process Skills</i>		
Paces		In game: A player must be able to exhibit control over the pace they use to control their robot in given situation to complete stages (going to fast will lead to increased failure because they are more likely to make mistakes and fall off the stage).
Attends		A player must be able to attend to the task in order to make progress otherwise there will be an increased rate of failure. However, a player can pause their attendance without risk of failure by either stopping their robot or pausing the game.
Heeds		Can be set up to either complete a certain number of stages, follow directions to reach a location on the stage, or work together cooperatively to complete a stage. The degree of this can be determined by the therapist.
Chooses	X	
Uses		Uses input devices as they are intended. In game: A player must use objects (i.e. blocks, walls, other robots) in the appropriate manner in order to complete certain stages.
Handles		Handles input devices as they are intended. In game: There are times when a player must carry the other robot to a location they cannot otherwise reach independently. In these cases, a player must be cautious of their speed and positioning otherwise they risk failing the stage.
Inquires		Can be determined by the therapist. (i.e. the player asking questions on how to complete a stage, or asking what to do next when playing cooperatively).
Initiates	X	

SKILL	N/A	Context of Skill Within the Game
Continues		In game: A player can start and stop movement within the game without any consequence but can exhibit mastery when their action becomes steady.
Sequences		In order to solve various stages, actions must take place in the correct order. Different elements are introduced in different stages. Switches that activate platforms or lasers. Blocks need to be positioned appropriately or the robots may need to use each other. A player must determine the course of action and then execute that sequence in order to complete a stage. The degree to which this is challenged, increases as progress is made through the stages.
Terminates		At times actions from one robot effects the fate of the other, they also can influence elements of the stage (i.e. platforms move when the player moves or lasers track a robot) because of this, a player must be able to terminate their actions at the opportune time in order to be successful in completing a stage.
Searches/locates		A player must be able to locate useful elements on a given stage by scanning the entire screen.
Gathers	X	
Restores	X	
Navigates		Some stages have dangers that a player must navigate the robots through (i.e. spikes and lasers) if the player touches these elements they fail and must restart the stage.
Notices/responds		Actions one robot takes can positively affect the stage for the other robot. A player can instinctively respond and react to these changes. However, the changes are persistent until the affecting robot discontinues the action they are taking. So, the player is not required to notice/respond in a time sensitive manner in order to be successful in the game.
Adjusts		This game is about trial and error. Failure is inevitable. However, a player must adjust the actions they take in order to improve their overall outcome until they are eventually successful in completing a stage
Accommodates		Can be determined by the therapist.

SKILL	N/A	Context of Skill Within the Game
		<p>A player must be able to learn from their previous attempts in order to eventually be successful in completing a stage. If a player is persistently making the same mistake repeatedly then external assistance may be necessary (i.e. asking for assistance from therapist if allowed)</p> <p>The degree to which this is challenged increases as progress is made through the stages</p>
Benefits		Can be determined by the therapist.
<p><i>Social Interaction Skills</i> The therapist can address social interaction skills using the game but this is client specific and thus can be determined by the therapist. Social skills can be addressed while playing cooperatively but is not otherwise required to be successful</p>		
Approaches/starts		<p>Can be determined by the therapist.</p> <p>The manner/degree in which a player interacts with another is wholly up to the therapist.</p>
Concludes/disengages		<p>Can be determined by the therapist.</p> <p>The manner/degree in which a player interacts with another is wholly up to the therapist.</p>
Produces speech		<p>Can be determined by the therapist.</p> <p>Players should produce speech in order to communicate with each other in order to be most successful.</p>
Gesticulates		Not required to be successful but the use of emotes can be used between players to communicate.
Speaks fluently		<p>Can be determined by the therapist.</p> <p>Players speak in a way that both players can understand.</p> <p>It is not required to be successful. Communication can be achieved non-verbally or through emotes within the game.</p>
Turns toward		<p>Can be determined by the therapist.</p> <p>But is not required to be successful.</p>
Looks		<p>Can be determined by the therapist.</p> <p>But is not required to be successful.</p>
Places self		Can be determined by the therapist.

SKILL	N/A	Context of Skill Within the Game
		But is not required to be successful.
Touches		Can be determined by the therapist (appropriate touching). May be present but not required to be successful.
Regulates		Players are able to remain focused on information relevant to the game.
Questions		Players are able to ask for appropriate clarifying information, when necessary, amongst each other or from the therapist. (i.e. What did you want me to do.).
Replies		Players continue relaying necessary information, responding accordingly when necessary. Leading to better coordination and cooperation during gameplay.
Discloses	X	
Expresses emotion		Can be determined by the therapist. Players appropriately express their own emotions and their emotions toward one another such as when one player messes up causing both to fail.
Disagrees		Players may need to appropriately express their differing opinions such as when discussing strategy on how to beat a level.
Thanks		May be present but not required to be successful.
Transitions	X	
Times response		Players respond to each other in a timely manner. Failure to respond in a timely manner can cause either player to make unnecessary mistakes.
Times duration		Players respond to each other in a timely manner. Failure to respond in a timely manner can cause either player to make unnecessary mistakes.
Takes turns		Can be determined by the therapist. (i.e. two individuals taking turns completing stages independently). There are times where in order to complete stages, first one robot needs to take actions (activating a switch) before the other robot can do anything. Cooperatively: Some stages require that each player assist the other in these cases players must be able to take turns effectively.
Matches language		May be present but not required to be successful.

SKILL	N/A	Context of Skill Within the Game
Clarifies		Players are able to clarify what they are attempting to communicate to the other player or therapist when necessary or when asked. Such as the gameplay strategy idea they may have.
Acknowledges and encourages		Players are able to acknowledge each other's frustrations when present as it is a challenging game and are able to appropriately encourage each other when necessary.
Empathizes		May be present but not required to be successful. Players are able to recognize the emotions the other is feeling such as when getting frustrated and able to understand why they are feeling that way.
Heeds		Players heed to the other's instructions when appropriate and able to communicate effectively and coordinate actions cooperatively in order to be successful in beating levels.
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.

Areas of Treatment (Application)

Mild cognitive impairment
Attention Skills
Problem solving ability
Some fine motor aspects
Social Behaviors such as turn taking and patience
Emotional Control
Cooperative Play

Interest Tags

Puzzles, Robots

Good Pizza, Great Pizza

Good Pizza, Great Pizza, is a simple yet fun game that has the potential to challenge various skills such as attention, memory, money management, visual scanning, and fine motor skills. When a customer arrives at the player's pizza shop, they give their order once. The order only displays on screen for a discrete amount of time. Once the prompt is dismissed by the player the order is not shown again. This means that players will be required to remember the order as they are preparing it. Orders start simple but as the player progresses, orders become more complex through the introduction of additional topping options, topping arrangement, cutting preferences, and variances in the duration of baking time. Players must be sure to sustain attention and engage their working memory in order to get the nuances of the order correct for the customer. Toppings are not labeled in any way; therefore, players must discern and identify toppings based on their shape and color alone. Additionally, as more topping options are offered, the player's screen becomes filled more and more with topping stations. Eventually, the whole screen becomes filled with toppings. Thus, requiring the player to visually scan for the desired toppings.

The game can be played with mouse and keyboard (on PC), controller (on consoles), and additionally touch controls (on Nintendo Switch). It is recommended to play the game on the Nintendo Switch because of the added possibility of touch controls. With touch controls, fine motor skills can be challenged to a greater degree than on any other platform requiring precision movements with the wrist, hand, and fingers.

At the end of each day, players take their profits and must then decide how to best use them among the following options: restocking for the next day, paying for equipment improvements or repairs, or investing in aesthetic/decorative items that increase things like the number of tips received and customer respawn rates. Players must manage money wisely because if they are not able to restock and make repairs then they will face a game over.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: Good Pizza, Great Pizza

Objects and Their Properties Required

Which Platform: Switch, PC, Mac

Time to Play: One day takes ~2 minutes to complete

Sequencing and Timing

1. The player is given an order from a customer
2. The player places the dough
3. (Depending on the order) the player places the toppings as requested

4. The player places the pizza in the oven as requested by the customer (i.e. regular or well done)
5. The player cuts the pizza based on the customer's order (i.e. four slices, in half)

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions, praxis, cognitive flexibility, insight		<p>This game has an element of money management, as such players will need to make sound judgements on where to invest their money in order to progress. Otherwise, progress will be slow going or lead to a game over.</p> <p>Upgrades include better equipment to improve cooking, decorations to increase customer happiness and spawn rates, and new pizza toppings to allow for better service.</p> <p>However, players need to remain cognizant that each day they need to restock any used ingredients as well as fund potential repairs otherwise the inability to do so will lead to a game over</p>
Attention: sustained attention and concentration; selective, divided, and shifting attention		<p>This game requires a degree of concentration to place toppings effectively (i.e. toppings need to be evenly distributed, or to the customer's request as well as shifting and divided attention when preparing orders with multiple pizzas.</p> <p>The game is set up like an assembly line, 1. Take the order, 2. Assemble the Pizza, 3. Run it through the oven, 4. Cutting and boxing the pizza, 5. Handing the Pizza to the customer.</p> <p>In order to complete pizza orders in a timely manner players will need to multitask. The player can assemble the next pizza while another is run through the oven and or box one pizza while another is in the oven.</p>
Memory: short-term, working, and long-term		This game challenges short term memory and working memory to a degree. Players need to

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
memory		<p>remember customers' orders as they are given to them as the order is not repeated or displayed any other time in the game.</p> <p>The complexity of the orders get harder as the player progresses. Including aspects such as different toppings, half and half pizzas, well done (run in oven twice) and specific cutting dimensions</p>
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive	X	
Thought: control and content of thought, awareness of reality, logical and coherent thought		<p>The player is able to process customer orders and execute them effectively. Orders are sometimes vague and so the player will need to reason what the customer is looking for.</p> <p>For example, one customer during testing simply stated they would like some "za." The customer was given a cheese pizza and they responded saying they wanted a pepperoni pizza.</p> <p>This is part of learning the behaviors of the game and presumably the idea that one can't perfectly serve every customer.</p> <p>There is also an element of money management to this game, paying for toppings, repairs, and upgrades.</p>
Sequencing complex movement: regulating speed, response, quality, and time of motor production	X	<p>In this game, the quicker pizzas are accurately prepared the more potential customers the player can serve leading to more profits/tips.</p> <p>For this to be accomplished the players ability to regulate the speed in which they provide input to the controller, response time, quality and time of motor production will all be challenged to a degree because players need to accurately place toppings, and</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		provide inputs quickly.
Emotional: regulation and range of emotion, appropriateness of emotions	X	
Experience of self and time: appropriateness and range of emotion, body image, self-concept	X	
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful state		Complete consciousness is necessary in order to be successful in playing this game.
Orientation: orientation to person and self, place, time, and others	X	
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		As the player progresses leading to more variables (more toppings and complexity to the orders). The amount of stress the player feels may increase due to the need to complete the orders and to meet the profit quota (enough to afford the next day). This will test the players emotional stability, confidence, and motivation. There is also a degree of self-control and impulse control required to be successful because the player has to place enough toppings to make the customer happy but they should avoid placing too many because it will cost them more money to restock.
Energy and drive: motivation, impulse control, appetite	X	This is not an actively demanding game. It is mentally demanding
<i>Sensory Functions</i>		
Visual: quality of vision, visual acuity, visual stability, visual field		The player must possess adequate levels of vision and visual acuity to distinguish between toppings on screen as well as read customer order requests (Therapist could assist with this). The player's visual field can be tested

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		especially as more toppings are introduced because all the toppings are displayed on a single screen.
Hearing ; sound detection and discrimination; awareness of location and distance of sounds	X	
Vestibular : position, balance, secure movement against gravity	X	
Proprioceptive : awareness of body position and space	X	
Touch : feeling of being touched, touching various textures	X	<p>The game requires the use of a controller (or optionally mouse and keyboard if playing on PC). As well as touch controls if playing on the Nintendo Switch The player must physically interact with these input devices in order to play the game. Players must be able to tell if they holding the controller and or if they are hitting the desired inputs (triggers vs buttons vs joysticks) and if they are interacting with the joystick in the desired manner (orienting to the desired direction) and not pressing down with excessive force as this actuates another input L3 & R3 which can lead to unintended actions if the player did not mean to press those inputs.</p> <p>When using touch controls the player must tell when they are making contact with the screen and with how much force they are pressing on the screen otherwise they risk damaging the device.</p>
Pain : localized and generalized pain	X	
Temperature and pressure : thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility : range of motion		A player must have at minimum enough joint mobility in the hands and fingers to interact

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		<p>with the input device. The game requires specific inputs to complete the various stages of the pizza making process. Timely accurate motor production and response leads to more potential customers served and more profits. This challenges the player's ROM and precision of the hand finger and thumb joints.</p> <p>The shoulder and arm joints could be incorporated when using touch controls as the player will be required to lift and stabilize the shoulder and elbow joints.</p>
Joint stability: structural integrity of joints		<p>Can be determined by the therapist.</p> <p>This is most applicable when utilizing touch controls. The player's joint stability in the shoulder and elbow joints will be challenged in order to stabilize the arm for the duration of the gameplay session.</p>
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction		<p>Applicable when using touch controls.</p> <p>Players sustain a contraction in the shoulder and elbow in order stabilize the arm as they use their wrist, hand, and fingers to interact with the Nintendo Switch screen.</p> <p>Players select and place topping with their finger as well as draw the lines in which the pizza is cut.</p>
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting reactions		<p>Can be determined by the therapist.</p> <p>Normally, a player would participate in gameplay from a seated position. Requiring them to sustain postural control in that way.</p>
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		<p>This game challenges fine motor control and hand eye coordination to a degree when placing topping on the pizza. Especially if playing on Nintendo Switch because the game uses touch controls.</p> <p>The player normally uses two hands to interact with the input device.</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Gait patterns: movements used to walk	X	
Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function		
Cardiovascular system: blood pressure, heart rate and rhythm	X	
Respiratory system: rate, rhythm, depth of respiration	X	
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity	X	
Voice and speech: rhythm and fluency, alternative vocalization functions	X	

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		
Aligns		Can be determined by the therapist.
Stabilizes		Can be determined by the therapist.
Positions		Can be determined by the therapist. The player must position themselves so that they can distinguish everything on screen as well as position their bodies so that they can execute required actions with the hands and fingers (or fingers, hand, wrist, arm, and shoulder if using touch controls) comfortably for the duration of the gameplay session.
Reaches		When using touch controls, the therapist can position the device in such a way that requires the player to reach to interact with the device.
Bends		When using touch controls the therapist can place the device at a different level from the player requiring them to bend to interact with the device.
Grips	X	
Manipulates		Interacting with the input device of choice requires a degree of manipulation.

SKILL	N/A	Context of Skill Within the Game
Coordinates		Normally, the player used both hands to interact with the input device.
Moves	X	
Lifts	X	
Walks	X	
Transports		In game: The player has to initiate moving the pizza from the toppings station, to the oven, to the cutting board, to the box, and finally delivered to the customer.
Calibrates		In order to prepare the pizza and place toppings with accuracy the player must be able to calibrate the rate at which they interact with the thumb stick or move their finger when using touch controls. Otherwise, they risk misplacing topping or putting sauce on the crust of the pizza leading to less customer satisfaction.
Flows		Some toppings require a degree of flow to place them effectively (i.e. sauce and cheese) As the player is required to steadily draw a circle with either the control stick or finger when using the touch controls.
Endures		The player must endure postural control and hand and finger movements for the duration of the gameplay session.
Paces		The better the player is able to maintain the pace of their hand in finger movements, the better the gameplay outcome will be. If they begin to slow, they will not be able to serve as many customers.
<i>Process Skills</i>		
Paces		Is challenged slightly, time passes as the player prepares pizzas. The longer the player takes the less pizzas they will be able to make in a day.
Attends		The player has to attend to the customer orders and the pizza preparing process in order to properly fulfill the order in order to improve outcomes (i.e. better tips). Players need to remember the customer's order and then accurately follow through with that order (the toppings, cooking options, and any specified cutting instructions).
Heeds		Can be determined by the therapist (i.e. number of proper completed orders and or limited mistakes).

SKILL	N/A	Context of Skill Within the Game
Chooses		At the end of each day, players have the option to purchase new toppings and or upgrades they choose as long as they have enough funds to do so.
Uses		The player uses the input devices as they are intended.
Handles		The player handles the input devices as they are intended.
Inquires		Can be determined by the therapist. The player could ask the therapist for a reminder of what the order was if allowed.
Initiates		The player initiates each step of the in game pizza making process in this game actively transitioning from taking the customer's order, to the topping station – initiating the selection of dough, sauce, and toppings, then transition to the oven – players must initiate placing the pizza back in the oven in the case of well-done orders, then there is the cutting station in which the player needs to initialize each cut, then next box the pizza, lastly the pizza order is actively handed over to the customer.
Continues		The player continues placing toppings until they are evenly distributed or to the customers' liking
Sequences		There is a sequence to making the pizzas. However, the game guides you through. Challenges to sequencing would occur when preparing the pizza (i.e. first dough, then sauce, then cheese, then toppings and/or when the pizza has to be well done).
Terminates		The player has to actively terminate placing toppings. It is possible to place too little or too many toppings. This can lead to customer dissatisfaction and higher ingredient costs.
Searches/locates		The player is able to locate the toppings needed on screen. Especially as more toppings are introduced because all the toppings are displayed on a single screen and are not labeled. (Think like the toppings station at a Subway).
Gathers	X	
Organizes	X	
Restores	X	
Navigates	X	

SKILL	N/A	Context of Skill Within the Game
Notices/responds		The player is able to notice differences in orders when clients order multiple pizzas and or mistakes in preparation are made and respond accordingly. Ruined pizzas can be thrown out and the player can choose to re attempt making the pizza as desired by the customer.
Adjusts		The player adjusts their gameplay for mistakes rather than repeating the same mistake frequently.
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.
<i>Social Interaction Skills</i> The therapist can address social interaction skills using the game but this is client specific and thus can be determined by the therapist. Otherwise, social interaction skills are not required to be successful in game. The player could potentially role play social interactions with the customers or the therapist could ask the client what appropriate responses might be. Money can also be introduced to simulate the order process.		
Approaches/starts		
Concludes/ disengages		
Produces speech		
Gesticulates		
Speaks fluently		
Turns toward		
Looks		
Places self		
Touches		
Regulates		
Questions		
Replies		
Discloses		
Expresses emotion		
Disagrees		
Thanks		
Transitions		
Times response		
Times duration		
Takes turns		
Matches language		
Clarifies		
Acknowledges and encourages		
Empathizes		
Heeds		

SKILL	N/A	Context of Skill Within the Game
Accommodates		
Benefits		

Areas of Treatment (Application)

Memory

Task Sequencing

Social Skills (impulse control)

Fine Motor

Money Management

Interest Tags

Food, Pizza

Tetris Effect: Connected

Tetris effect is a modern version of the original Tetris game. The potential therapeutic benefits of this game are the inherent problem solving required from the player to effectively place blocks as they come and avoid errant block placements that can result in a game-over. The demands become more challenging as the player progresses further. As the speed of the blocks increases, the degree of fine motor challenge the player experiences will also increase as the player must continue to provide accurate inputs to the input device with less time. There is also the element of planning ahead, placing blocks in such a way so that when a particular piece comes (such as the long piece) it can be placed most effectively in order to clear the maximum number of lines possible, thus leading to higher scores overall. Tetris Effect also provides a great deal of visual and auditory stimulation such as delivering blocks to the beat of the background music playing. This will challenge the player's ability to filter out excessive stimuli in order to focus on the gameplay. Overall, Tetris Effect is a game with the potential to challenge various cognitive skills and fine motor movements of the player.

Note: By default, the games visuals may be challenging due to the lack of contrast between the Tetris blocks and the background, which could be a potential way to challenge a player's visual skills, but if this is not the goal or the player simply has too much difficulty viewing the gameplay, there is a setting that will make the blocks contrast with the background more. There is also the option to turn off nearly all the excessive visual stimuli if desired.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: Tetris Effect: Connected

Objects and Their Properties Required

Which Platform: Nintendo Switch, PC, PlayStation, Xbox

Time to Play: 5-10 minutes to complete a level

Sequencing and Timing

1. Random blocks appear at the top of the screen
2. Player must stack/orient blocks using the directional buttons to move the block and the rotate buttons to orient the block with the goal of creating lines across the stage
3. Points are awarded each time lines are completed
4. Play continues until the score threshold is reached or the stack of blocks reaches the top of the stage

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions, praxis, cognitive flexibility, insight	X	
Attention: sustained attention and concentration; selective, divided, and shifting attention		<p>The player must sustain attention during gameplay in order to be successful.</p> <p>New pieces are constantly flowing because of this, players must continually think about where to place pieces and plan ahead in order to create lines.</p> <p>Selective attention can be challenged if visual effects are left on in this game. There is a lot of visual effects and distracting backgrounds in normal gameplay.</p>
Memory: short-term, working, and long-term memory		<p>The player can store a block to then swap with another block at any time. Remembering what block is stored is beneficial for effective gameplay.</p>
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive	X	
Thought: control and content of thought, awareness of reality, logical and coherent thought		<p>Thinking ahead and positioning blocks in such a way as to complete more lines at one time leads to better outcomes.</p> <p>The better the player is at planning ahead the more successful they will be during gameplay.</p>
Sequencing complex movement: regulating speed, response, quality,		Regulating speed, response, quality, and time of motor production are all factors that influence the success a player will have

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
and time of motor production		during gameplay. The more levels the player clears the faster the gameplay becomes (blocks fall faster). Thus, requiring the player to react quicker and provide more precise inputs to the input device.
Emotional: regulation and range of emotion, appropriateness of emotions		As a player progresses through the stages, they get increasingly more changing (i.e. blocks drop faster) this can lead to stressful situations as the player engages in gameplay. The player must manage their emotions when these situations arise.
Experience of self and time: appropriateness and range of emotion, body image, self-concept	X	
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful state		Complete consciousness is necessary in order to be successful in playing this game.
Orientation: orientation to person and self, place, time, and others	X	
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		A degree of impulse control is necessary in order to place the blocks effectively. It is possible that the player can get caught in the music that plays along with dropping the blocks making the player want to drop the blocks recklessly.
Energy and drive: motivation, impulse control, appetite		If the player progresses enough levels can become challenging leading to failure. A player must maintain a level of motivation to persevere past these challenges.
<i>Sensory Functions</i>		
Visual: quality of vision,		A player must possess adequate levels of

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
visual acuity, visual stability, visual field		<p>vision to distinguish objects on a screen. Players must possess enough visual acuity to determine where their guiding their current block.</p> <p>At times there can be a lot of visual stimuli on screen at any given time (i.e. visual effects in beat with the music and dropped blocks). This will challenge the player's ability to filter out excessive stimuli and attend to the important stimuli as well as visually track any moving elements at a given time.</p> <p>The amount of visual stimuli can be graded down with tweaks to the visual settings in game.</p>
Hearing ; sound detection and discrimination; awareness of location and distance of sounds	X	
Vestibular : position, balance, secure movement against gravity	X	
Proprioceptive : awareness of body position and space	X	
Touch : feeling of being touched, touching various textures	X	
Pain : localized and generalized pain	X	
Temperature and pressure : thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility : range of motion		A player must have at minimum enough joint mobility in the hands and fingers to interact with the input device. The game requires rapid button presses as well as timely responses on specific inputs (i.e. moving, rotating and stashing blocks) in order to be successful thus challenging the player's

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		ROM and precision of the hand, finger and thumb joints.
Joint stability: structural integrity of joints	X	
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction		There is an endless mode “marathon” that can be used to challenge a client’s hand and finger joints. It is as the name implies. The game only ends with a game over or when the player decides to stop.
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting reactions		The degree required can be determined by the therapist. Normally, a player would participate in gameplay from a seated position. Requiring them to sustain postural control in that way.
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		Eye hand coordination and fine motor control is challenged to a degree while using finger and thumb movements to provide controller inputs to place blocks as they fall in the desired position. Challenge increases with the more levels that are cleared.
Gait patterns: movements used to walk	X	
<i>Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function</i>		
Cardiovascular system: blood pressure, heart rate and rhythm	X	
Respiratory system: rate, rhythm, depth of respiration	X	
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity	X	
Voice and speech: rhythm and fluency, alternative vocalization functions		Can be determined by the therapist. When playing cooperatively this can be

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		challenged to a degree but is not required to be successful.

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		
Aligns		Can be determined by the therapist.
Stabilizes		Can be determined by the therapist.
Positions		Can be determined by the therapist. The player must position themselves in such a way in relation to the display so that they are able to view the entire display without the elements on screen being too small for them to see. They must position their body as well as limbs, wrists, hands, and fingers in a way that is comfortable and enables them to best endure the duration of the play session and sustain postural control.
Reaches	X	
Bends	X	
Grips	X	
Manipulates		Interacting with the input device of choice requires a degree of manipulation.
Coordinates		Normally, the player used both hands to interact with the input device.
Moves	X	
Lifts	X	
Walks	X	
Transports	X	
Calibrates		The speed at which the player makes inputs on the controller can affect overall outcomes. Meaning if the player frantically presses buttons or tries to rush, could lead to more mistakes and ultimately failure of the level.
Flows		With mastery, players should be able to move seamlessly from providing inputs to place one block right into providing input for the next block.
Endures		The player must endure postural control and hand and finger movements for the duration of the

SKILL	N/A	Context of Skill Within the Game
		gameplay session or until they reach a suitable stopping point. The player may not always be able to stop and pause the game, especially during the faster paced levels, attempting to pause or if they become too fatigued to finish a level in one sitting could cause them to fail the levels because the blocks are coming too quickly.
Paces		Players must provide inputs in a timely manner, keeping pace with the speed of the current level. Failure to keep pace will ultimately lead to the player failing the level.
Process Skills		
Paces		The game's tempo steadily increases as the player progresses through levels, thus challenging the player's ability to keep pace in order to be successful. Players need to make decisions quickly especially in higher levels, deciding how and where to place blocks that best sets up the next upcoming block.
Attends		The player must sustain attention during gameplay in order to be successful. New pieces are constantly being introduced. Because of this, players must continually think about where to place pieces and plan ahead in order to create lines.
Heeds		Can be determined by the therapist. Beating a certain number of levels or not stashing blocks (with or without distracting visual effects).
Chooses	X	
Uses		The player uses input devices as they are intended.
Handles		The player handles input devices as they are intended.
Inquires		The player could ask the therapist for clarifying question if necessary and if allowed.
Initiates	X	Blocks fall without the player's input.
Continues		Player continues gameplay placing blocks without pause. Excessive pauses will lead to increased rate of failure especially in later levels.
Sequences		In game: the player attempts to place the blocks as they are presented in the most beneficial way in order to continue progression. If players are thinking ahead and planning, they can place blocks in preparation for a particular block (for example,

SKILL	N/A	Context of Skill Within the Game
		the long block) to clear the most rows and lead to higher scores.
Terminates	X	
Searches/locates	X	
Gathers	X	
Restores	X	
Navigates	X	
Notices/responds		Players instinctively act to place blocks as they are presented without any additional external prompting.
Adjusts		Errant blocks will be placed by mistake from time to time. It is during these times when the player can adjust, overcoming a poor situation and still be successful in completing a stage or setting a high score.
Accommodates		Can be determined by the therapist but this is client specific.
Benefits		Can be determined by the therapist but this is client specific.
<i>Social Interaction Skills</i> The therapist can address social interaction skills using the game but this is client specific and thus can be determined by the therapist. Social skills can be addressed while playing cooperatively but are not otherwise required to be successful.		
Approaches/starts		Players start relaying necessary information to each other.
Concludes/disengages		
Produces speech		Players may produce speech in order to communicate with each other in order to be most successful. However, this is not specifically required to be successful.
Gesticulates	X	
Speaks fluently		Players speak in a way that both players can understand
Turns toward	X	
Looks	X	
Places self	X	
Touches		Can be determined by the therapist (appropriate touching). May be present but not required to be successful

SKILL	N/A	Context of Skill Within the Game
Regulates		Players are able to remain focused on information relevant to the game.
Questions		Players are able to ask appropriate questions to gather beneficial information, when necessary, amongst each other or from the therapist.
Replies		Players continue relaying necessary information, responding accordingly when necessary. Leading to better coordination and cooperation during gameplay (going for multiple line clears rather than single line clears).
Discloses	X	
Expresses emotion		Can be determined by the therapist. Players appropriately express their own emotions and their emotions toward one another such as when one player messes up causing both to fail.
Disagrees		Can be determined by the therapist. Players will have to work together in order to complete stages. There are times when each player may have their own opinions/ideas on how to go about completing a stage. Discussing/executing these ideas in an appropriate manner will improve rate of success (going for multiple line clears rather than single line clears).
Thanks		May be present but not required to be successful.
Transitions	X	
Times response		Players respond to each other in a timely manner. Failure to respond in a timely manner can cause either player to make unnecessary mistakes due to the fast-paced nature of the game, information needs to be communicated quickly and efficiently
Times duration		Players relay information to each other in a timely manner. Failure to relay information in a timely manner can cause either player to make unnecessary mistakes due to the fast-paced nature of the game, information needs to be communicated quickly and efficiently.
Takes turns	X	
Matches language		May be present but not required to be successful.
Clarifies		Players are able to clarify what they are attempting to communicate to the other player or therapist when necessary or when asked.

SKILL	N/A	Context of Skill Within the Game
Acknowledges and encourages		Players are able to acknowledge each other's frustrations when present as it is a challenging game and are able to appropriately encourage each other when necessary.
Empathizes		May be present but not required to be successful. Players are able to recognize the emotions the other is feeling such as when getting frustrated and able to understand why they are feeling that way.
Heeds		Players heed to the others instructions when appropriate and able to communicate effective and coordinate actions cooperatively in order to be successful in beating levels
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.

Areas of Treatment (Application)

Cognitive impairment
Emotional regulation
Planning ahead
Attention deficits

Interest Tags

Puzzles, Tetris, Music

Unpacking

Unpacking is a simple and peaceful “moving-in simulator.” This game can challenge concept formation and praxis, as players are required to visually interpret an object, determine what the object is, then decide which room of the house is appropriate for the object to be placed in. The therapist could collaborate with the player to determine where the most appropriate location for a given item is. It could be used as a virtual substitute to organize one’s room/home before attempting a real-life scenario.

There is no time limit and there is an option in the settings of the game that when enabled, gives the player the freedom to place any object anywhere, making it so that there are no “correct” location requirements to clear a given level.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: Unpacking

Objects and Their Properties Required

Which Platform: Xbox PlayStation Switch PC

Time to Play: ~5-10 minutes to finish a room

Sequencing and Timing

Players are presented with an in home setting and tasked with unpacking boxes and placing them in appropriate locations

1. Open a box
2. Place given item in appropriate location
3. Return to box to grab another item
4. Repeat steps 1-3 until all the items are unpacked

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions,		This game requires the player to have a degree of concept formation as well as praxis because players will need to mentally ascertain what the current object they are

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
praxis, cognitive flexibility, insight		<p>placing is and then where might the most appropriate location for that item might be.</p> <p>Some levels have multiple rooms and so one box in one room might contain an item from another room (i.e. a pot that belongs in the kitchen that came out of the box in the bathroom).</p>
Attention: sustained attention and concentration; selective, divided, and shifting attention		<p>This game requires sustained attention to a degree in order to complete the unpacking task.</p> <p>There is no time limit but progress can only be made while the player attends to the game because the player must actively place the objects in desired locations.</p> <p>Other elements of attention can be addressed based on parameters set by the therapist. For example, the therapist can ask the client to finish the boxes in one room before moving on to the next room.</p> <p>Players can use context clues to determine where an item may belong (i.e. other items that were replaced in a level like shelves and desks etc.). This requires a degree of attention.</p>
Memory: short-term, working, and long-term memory	X	
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive	X	
Thought: control and content of thought, awareness of reality, logical and coherent thought		<p>Items have logical locations. Players will need to be able to think logically when placing items.</p> <p>Incorrectly placed items will be highlighted once the player tries to submit the level for completion.</p>

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		There is a setting that allows items to be placed wherever the player desires, enabling a greater degree of freedom during gameplay.
Sequencing complex movement: regulating speed, response, quality, and time of motor production	X	
Emotional: regulation and range of emotion, appropriateness of emotions	X	
Experience of self and time: appropriateness and range of emotion, body image, self-concept		<p>Players could potentially relate to the setting as levels progress. They represent periods of time in a person's life (i.e. moving into a new little house or moving into a college dorm).</p> <p>Players could use these settings to then relate back to themselves.</p>
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful state		The player must have full consciousness in order to play the game.
Orientation: orientation to person and self, place, time, and others	X	
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness; emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite	X	
Energy and drive: motivation, impulse control, appetite		This is a low energy easy going game.
<i>Sensory Functions</i>		

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Visual: quality of vision, visual acuity, visual stability, visual field		Players will need to be able to distinguish what the items are while they are unpacking in order to place them correctly as well as have enough quality of vision to determine which room they are presently in to help determine if an item belongs there.
Hearing: sound detection and discrimination; awareness of location and distance of sounds	X	
Vestibular: position, balance, secure movement against gravity	X	
Proprioceptive: awareness of body position and space	X	
Touch: feeling of being touched, touching various textures		The game requires the use of a controller (or optionally, mouse and keyboard if playing on PC). As well as touch controls if playing on the Nintendo Switch The player must physically interact with these input devices in order to play the game. Players must be able to tell if they holding the controller and or if they are hitting the desired inputs (triggers vs buttons vs joysticks) and if they are interacting with the joysticks in the desired manner (orienting to the desired direction and not pressing down with excessive force as this actuates another input L3 & R3 which can lead to unintended actions if the player did not mean to press those inputs.
Pain: localized and generalized pain	X	
Temperature and pressure: thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility: range of motion		A player must have at minimum enough joint mobility in the hands and fingers to interact with the input device. This challenges the player's ROM and precision of the hand finger and thumb joints.

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		The game is slow paced and relaxing allowing players to move at their own pace.
Joint stability: structural integrity of joints	X	
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction	X	
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting reactions		This can be determined by the therapist. Normally, a player would participate in gameplay from a seated position. Requiring them to sustain postural control in that way.
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		This game will challenge fine motor control to a degree in order to place various items effectively. Some spaces are small such as desktop areas and interacting with objects such as opening drawers require a degree of precision when manipulating a mouse or joystick of the input device.
Gait patterns: movements used to walk	X	
Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function		
Cardiovascular system: blood pressure, heart rate and rhythm	X	
Respiratory system: rate, rhythm, depth of respiration	X	
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity	X	
Voice and speech: rhythm and fluency, alternative vocalization functions	X	

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
<i>Motor Skills</i>		
Aligns		Can be determined by the therapist.
Stabilizes		Can be determined by the therapist.
Positions		The player positions themselves in a way so that they can view the entire screen and positions their arms, hands, and fingers so that they can comfortably interact with the input device for the duration of the gameplay session. In game: objects need to be positioned in such a way to fit other items, such as, when placing items in cabinets or on a bookshelf.
Reaches	X	
Bends	X	
Grips		Normally the player maintains grip on the input device. However, the controller can be placed on a surface and the player could still play the game effectively.
Manipulates		The player must be able to manipulate the input device to effectively play the game
Coordinates		Normally, the player used both hands to interact with the input device
Moves	X	
Lifts	X	
Walks	X	
Transports		In game: Some levels require the player to unpack multiple rooms and items meant for one room could be unpacked from a box in another room. The player will need to transport objects between rooms in these instances in order to correctly place the items.
Calibrates	X	
Flows	X	
Endures		The player must endure postural control and hand and finger movements for the duration of the gameplay session.
Paces	X	
<i>Process Skills</i>		
Paces	X	
Attends		The player will need to attend to the game in order to be aware what room they are in and what objects they presently have in order to play the game effectively.

SKILL	N/A	Context of Skill Within the Game
		Progress can only be made so long as the player is able to attend, because the player must actively place objects.
Heeds		Can be determined by the therapist. The player can complete a room(s) independently or they can follow instructions from a third party.
Chooses		In game: The player has minor freedom to place objects as long as they are in the appropriate place. There is a setting in the game that allows all items to be placed anywhere. Freeing the player even more.
Uses		The player uses the input device as it was intended.
Handles		The player handles the input device appropriately.
Inquires		Can be determined by the therapist. The player could ask for assistance on where an object belongs if allowed.
Initiates		In game: There are multiple boxes that need to be unpacked in each level. The player initiates the unpacking process of each box. The player must actively retrieve each subsequent item from a box they are unpacking.
Continues		In game: The player can continue to unpack the box they started before moving on to the next.
Sequences		Can be determined by the therapist. Players are free to tackle the unpacking process as they see fit. However, the therapist can enforce parameters that facilitate a type of structure. Examples might be placing each item as it is unpacked, finishing one box before moving to the next, or first organizing items by room before placing them.
Terminates	X	
Searches/locates		Boxes can first be unpacked before putting objects in appropriate places. In these cases, the therapist can have the player search for requested objects. Normally, the player will need to locate the appropriate location for items.
Gathers		Can be determined by the therapist.

SKILL	N/A	Context of Skill Within the Game
		The player is free to gather all appropriate items in a room before thinking about where to place them (fully unpack boxes first).
Organizes		If boxes are completely unpacked before putting items away, the therapist can have the player organize items into the rooms that they belong in.
Restores		The premise of the game is to place packed objects in appropriate places. Players will need to determine where an item belongs.
Navigates	X	
Notices/responds		It is possible for players to instinctively place items without external prompting. After all items are placed, incorrect items are then highlighted and the player must find the correct location.
Adjusts	X	The player will need to respond to these mistakes and make changes appropriately to complete levels.
Accommodates		This can be determined by the therapist.
Benefits		This can be determined by the therapist.
<i>Social Interaction Skills</i> The therapist can address social interaction skills using the game but this is client specific and thus can be determined by the therapist. Otherwise, social interaction skills are not required to be successful in game.		
Approaches/starts		
Concludes/disengages		
Produces speech		
Gesticulates		
Speaks fluently		
Turns toward		
Looks		
Places self		
Touches		
Regulates		
Questions		
Replies		
Discloses		
Expresses emotion		
Disagrees		
Thanks		
Transitions		
Times response		

SKILL	N/A	Context of Skill Within the Game
Times duration		
Takes turns		
Matches language		
Clarifies		
Acknowledges and encourages		
Empathizes		
Heeds		
Accommodates		
Benefits		

Areas of Treatment (Application)

OCD

Simulated House Cleaning

Cognitive impairment

Apraxia

Interest Tags

Cleaning/Organizing

It Takes Two

It Takes Two is a game that requires two players to play, hence the name. It has the most potential to benefit social skills as cooperation and communication between players is an integral part of the gameplay. Throughout the game, both players take actions that either aid the other player or that need to be completed in tandem with one another. For example, players are tasked with challenges like having one player stand on a button that opens a gate and staying in this position while the other player physically walks through the newly opened gate, or flying a plane where one player is the pilot and the other is the gunner. If one player fails to aid the other in these circumstances, then progress cannot be made or both players will die in-game resulting in a loss of progress. Some collaborative problem solving is needed to navigate certain areas or to clear boss battles when there is no clear path forward that one player can act upon alone. There are times when the way to navigate forward or beat a boss may not always be clear.

Fine motor skills, regulating speed, response, quality, and timing of motor production are also areas that can be challenged as players interact with their input devices given the high prevalence of game tasks that require platforming across gaps, dodging enemy attacks, etc. Failure to perform these motor skills in an accurate and timely manner will result in player death or failure and having to restart at the nearest checkpoint.

Note: The game is a linear, “story” experience; meaning it is not a game that is segmented into levels that can be repeated. However, after the game is completed, players are free to choose from chapters they would like to replay. This game is best suited as a longitudinal tool in which the therapist plays with or has two patients play together across multiple sessions.

Modified From: Banks, T., Ebner, C., & Polidan, K. (2017). Occupation-Based activity analysis.

[Class handout]. Blackboard. https://class.usa.edu/ultra/courses/_17115_1/cl/outline

Video Game Activity Analysis Template

Title of Video Game: It Takes Two

Objects and Their Properties Required

Which Platform: Nintendo Switch, PC, PlayStation, Xbox

Time to Play: No definitive time

Sequencing and Timing

It Takes Two has no set or repeating sequence. All actions taken are dependent on context and the specific situation at the time of gameplay. There are similarly repeated actions such as when platforming, but this is not always done in the same way.

Body Functions Required

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
Higher-level cognitive judgment, concept formation, metacognition, executive functions, praxis, cognitive flexibility, insight	X	
Attention: sustained attention and concentration; selective, divided, and shifting attention		<p>There is a logical progression to solving each stage. Players must pay attention to the environments and how their character can interact with it in order to come up with the solution. Ultimately, completing a stage most often requires concentration, sustained and selective attention. Players must observe their environment for elements that would help them make progress. (vacuum tubes that launch the player, levers and switches that affect surroundings, and targets that can interact with specific items gained throughout the game.</p> <p>Sustained attention will be specifically required during boss sequences and instances where the characters live are in danger such as when platforming through stages as there are threats that can damage the player and pitfalls the player can fall in.</p>
Memory: short-term, working, and long-term memory	X	
Perception: discrimination of sensations: auditory, tactile, visual, olfactory, gustatory, vestibular, and proprioceptive	X	
Thought: control and content of thought, awareness of reality, logical and coherent thought		Each stage has a logical solution that must be discovered by the player. In order to be successful, the player must be able to think logically.

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		Various parts of the game will challenge thought more. This game is a linear story and not broken up into levels. Once the game is completed, it is possible to revisit specific section of the game.
Sequencing complex movement: regulating speed, response, quality, and time of motor production	X	
Emotional: regulation and range of emotion, appropriateness of emotions	X	
Experience of self and time: appropriateness and range of emotion, body image, self-concept	X	
<i>Global Mental Functions</i>		
Consciousness: awareness and alertness, clarity and continuity of the wakeful state		Complete consciousness is necessary in order to be successful in playing this game.
Orientation: orientation to person and self, place, time, and others		In game: There are moments in some puzzles where the players are separated. In these times, actions each player takes can influence the other. It is during these instances that players must be able to orient themselves to others. An example would be when one player controls switches that affect the environment for the other player. Both players must be able to orient themselves to each other because if they are out of sync, the wrong button could be hit at the wrong time or the other player could be standing in the wrong spot at the wrong time.
Temperament and personality: extroversion, introversion, agreeableness, and conscientiousness;		This game is all about working together. As such, it requires agreeableness, extroversion, and willingness to work with others. Actions are taken by one player to benefit the other all throughout the game.

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
emotional stability; openness to experience; self-expression; confidence; motivation; self-control and impulse control; appetite		<p>There are points where one player can doom the other or leave them behind. It is in these moments when the players' self-control and impulse control are challenged to a degree.</p> <p>An example is when one player flies a plane while the other shoots. The player flying the plane could purposely crash or not align with the enemies so that their partner can shoot them down leading to failure. At the same time, the player shooting could choose not to shoot the enemies dooming them both to fail.</p>
Energy and drive: motivation, impulse control, appetite	X	
<i>Sensory Functions</i>		
Visual: quality of vision, visual acuity, visual stability, visual field		A player must possess adequate levels of vision to distinguish objects on a screen. Players must possess enough visual acuity to determine where they are on screen as well as identify any enemies present and or obstacles to navigate through. As well as distinguish their in-game character from their partner's
Hearing: sound detection and discrimination; awareness of location and distance of sounds	X	
Vestibular: position, balance, secure movement against gravity	X	
Proprioceptive: awareness of body position and space		In game: The player has to be aware of where the character is in space in order to platform through the levels successfully and to dodge attacks from bosses.
Touch: feeling of being touched, touching various textures	X	The game requires the use of a controller (or optionally mouse and keyboard if playing on PC) that the player must physically interact with. Players must be able to tell they are holding the controller and or if they are hitting the desired inputs (triggers vs buttons vs joysticks) and if they are interacting with

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		the joystick in the desired manner (orienting to the desired direction and not pressing down with excessive force as this actuates another input L3 & R3 which can lead to unintended actions if the player did not mean to press those inputs.
Pain: localized and generalized pain	X	
Temperature and pressure: thermal awareness, sense of force applied to skin	X	
<i>Neuromusculoskeletal and Movement-Related Functions</i>		
Joint mobility: range of motion		A player must have at minimum enough joint mobility in the hands and fingers to interact with the input device. The game requires rapid button presses as well as timely responses on specific inputs (i.e. jumping and dodging) in order to be successful, thus challenging the player's ROM and precision of the hand, finger and thumb joints.
Joint stability: structural integrity of joints	X	
<i>Muscle Functions</i>		
Muscle endurance: sustaining muscle contraction	X	
<i>Movement Functions</i>		
Involuntary movement reactions: postural, body adjustment, and supporting reactions		Can be determined by the therapist. Normally, a player would participate in gameplay from a seated position. Requiring them to sustain postural control in that way.
Control of voluntary movement: eye-hand and eye-foot coordination, bilateral integration, crossing midline, fine and gross motor control, oculomotor control		During platforming and boss fighting elements, hand eye coordination, fine motor control, and oculomotor control, will be challenged to a degree. The game has elements that the player must visually track (i.e. moving platforms, enemies, and incoming enemy projectiles). This will challenge the player's oculomotor control. The player also needs to make

FUNCTION (Specific Mental Functions)	N/A	Detailed Description
		accurate and timely responses to these elements as they occur on screen (dodging enemy attacks, jumping over projectiles, timing jumps to successfully traverse gaps) thus challenging hand eye coordination and fine motor control to a degree. Normally, the player uses both hands when using the input device.
Gait patterns: movements used to walk	X	
Cardiovascular, Respiratory, Voice and Speech, Digestive, Skin Function		
Cardiovascular system: blood pressure, heart rate and rhythm	X	
Respiratory system: rate, rhythm, depth of respiration	X	
Additional functions of the cardiovascular and respiratory systems: physical endurance, stamina, aerobic capacity	X	
Voice and speech: rhythm and fluency, alternative vocalization functions		This game has elements that require players to coordinate their actions together to be successful during gameplay. This can be accomplished with speech. However, this is not required to be successful.

Performance Skills Required

SKILL	N/A	Context of Skill Within the Game
Motor Skills		
Aligns		Can be determined by the therapist.
Stabilizes		Can be determined by the therapist.
Positions		Can be determined by the therapist. The player must position themselves in such a way in relation to the display so that they are able to view the entire display without the elements on screen being too small for them to see. They must position their body as well as limbs, wrists, hands,

SKILL	N/A	Context of Skill Within the Game
		and fingers in a way that is comfortable and enables them to best ensure the duration of the play session and sustain postural control. In game: players need to position their character effectively to be successful in game (i.e. position on platforms, and dodging enemy attacks).
Reaches	X	
Bends	X	
Grips	X	
Manipulates		Interacting with the input device of choice requires a degree of manipulation.
Coordinates		Normally, the player used both hands to interact with the input device
Moves		In game: The game has elements where each player needs to move certain objects in order to progress through the stage.
Lifts	X	
Walks	X	
Transports	X	
Calibrates		In game: Platforming requires players to calibrate how quickly they run and jump because often these actions must be in sync with actions from the other player.
Flows	X	
Endures		The player must endure postural control and hand and finger movements for the duration of the gameplay session or until they reach a suitable stopping point.
Paces	X	
<i>Process Skills</i>		
Paces		Some platforming elements have a timing element to them. In these cases, the player will need to keep up with the required timing. The same can be said for boss fights. This includes jumping on platforms at the right times as it rotates. There is at least one boss that requires the players to block attacks at the appropriate time.
Attends		A player must attend to the game throughout the length of the gameplay session otherwise there will be an increased rate of failure.
Heeds		Can be determined by the therapist.

SKILL	N/A	Context of Skill Within the Game
		This is a linear game. It is not split into segments or stages.
Chooses	X	
Uses		The player uses the input device as intended.
Handles		The player handles the input device as intended.
Inquires		This skill is utilized when the two players are working together to figure out how to progress through a stage. The player can ask questions of the therapist when necessary and if allowed.
Initiates		In game: Various actions require the player to initiate them (i.e. pressing a button at the right time allowing the other player to progress).
Continues		In game: Various actions require the player to initiate them (i.e. holding up a vacuum tube allowing the other player to progress).
Sequences		In game: the player has to sequence how to navigate through stages using a series of jumps and dashes as well as special abilities, in some cases using specific items obtained during gameplay.
Terminates		The player terminates the various cooperative platforming elements once the other player progresses through. (i.e. letting go of the vacuum tube once the other player progresses through).
Searches/locates		There are puzzle elements in which players will need to search around in the environment for a solution.
Gathers	X	
Organizes	X	
Restores	X	
Navigates		In game: The player navigates through platforming elements successfully without frequent falls.
Notices/responds		This may be present as players work together to progress through a stage, they can instinctively react to each other's actions.
Adjusts		Players adjust their gameplay to account for previous failures eventually leading to success.
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.
<i>Social Interaction Skills</i> The therapist can address social interaction skills using the game but this is client specific and thus can be determined by the therapist. The game requires two people to play together.		

SKILL	N/A	Context of Skill Within the Game
Approaches/starts		Players start relaying necessary information to each other.
Concludes/ disengages	X	
Produces speech		Players should produce speech in order to communicate with each other in order to be most successful. However, speech is not specifically required to be successful.
Gesticulates		This can be used to communicate if players are playing in the same space.
Speaks fluently		Players speak fluently to each other so that they can understand.
Turns toward	X	
Looks	X	
Places self	X	
Touches		Can be determined by the therapist (appropriate touching). May be present but not required to be successful.
Regulates		Players are able to remain focused on information relevant to the game.
Questions		Players are able to ask for appropriate clarifying information, when necessary, amongst each other or from the therapist. (i.e. What did you want me to do. How do I do X again, or how do I dodge X attack etc...).
Replies		Players continue relaying necessary information, responding accordingly when necessary. Thus, leading to better coordination and cooperation during gameplay.
Discloses	X	
Expresses emotion		Can be determined by the therapist. Players appropriately express their own emotions and their emotions toward one another such as when one player messes up causing both to fail.
Disagrees		Players may need to appropriately express their differing opinions such as when discussing strategy on how to beat a level (particularly with boss fights).
Thanks		May be present but not required to be successful.
Transitions	X	

SKILL	N/A	Context of Skill Within the Game
Times response		Players respond to each other in a timely manner. Failure to respond in a timely manner can cause either player to make unnecessary mistakes, such as falling off the stage or taking unnecessary hits from bosses.
Times duration		Players relay information to each other in a timely manner. Failure to relay information in a timely manner can cause either player to make unnecessary mistakes. Players should do their best to communicate concisely, particularly during boss fights and the faster paced moments in the game.
Takes turns		In game: Frequently, players have to take turns helping each other navigate areas in various ways. Flipping switches, creating platforms for each other with unique items, and holding up vacuum tubes.
Matches language		May be present but not required to be successful.
Clarifies		Players are able to clarify what they are attempting to communicate to the other player or therapist when necessary or when asked. Such as the gameplay strategy idea they may have or when they recognize a pattern in a given boss battle.
Acknowledges and encourages		Players are able to acknowledge each other's frustrations when present, as it is a challenging game and are able to appropriately encourage each other when necessary.
Empathizes		May be present but not required to be successful. Players are able to recognize the emotions the other is feeling such as when getting frustrated and able to understand why they are feeling that way.
Heeds		Players heed to the others instructions when appropriate and able to communicate effectively and coordinate actions cooperatively in order to be successful in beating levels.
Accommodates		Can be determined by the therapist.
Benefits		Can be determined by the therapist.

Areas of Treatment (Application)

Social skills (turn taking)

Social play

Cooperation

Reaction time

Problem solving

Interest Tags
Platformers