Functional Translation of Adaptive Video Gaming to Tasks for Daily Indepedence

Drew Redepenning BBME ATP, Sara Huss MD
Albany Medical College, Division of PM&R

Background

Over the past two years, the field of adaptive gaming has been growing rapidly. Many adaptive video game controllers are now available to individuals with disabilities who are unable to access a standard controller, and range from head-controlled pneumatic joysticks to customizable gaming rigs that enable users to connect external joysticks and accessibility switches. Despite the rising popularity of adaptive gaming, it's acceptance as an integral service within the rehabilitation field has been slow to develop. The purpose of this study was to determine if participation in adaptive gaming and use of adaptive gaming equipment can translate to other tasks related to daily independence. Demonstrating the translation of adaptive gaming to other applications, including environmental access, vocational and educational use, and communication, may help establish the value of expanding adaptive gaming services within the rehabilitation field.

Methods

Participants were individuals between 18 to 65 years of age that met the following criteria: (1) must have a physical or neurologic condition limiting them from using a standard game controller; (2) must be currently using adaptive gaming equipment or modifications for video gaming; (3) must have no less than six months of experience using adaptive gaming equipment or modifications. Participants were asked to complete a self-administered questionnaire consisting of four parts: (1) General Information and Gaming Habits, (2) Quality of Life,[1] (3) Social Relationships and Social Isolation,[2,3] and (4) Influence of Gaming on Quality of Life, Satisfaction with Life, and Social Relationships.[4]

General Information Section

What is your sex?

What is your age?

What is your primary diagnosis?

Do you use your adaptive gaming equipment for any other activities? If so, please select all activities that apply below:

Computer Access | Phone Access/ Communication | TV Access | I only use it for gaming | Other (please specify)

Quality of Life Section

Thinking about your own life and personal circumstances, how satisfied are you with your life as a whole in the past four weeks?

0 Completely Dissatisfied 1 2 3 4 5 Moderately Satisfied 6 7 8 9 10 Completely Satisfied

How satisfied are you with your physical health in the past four weeks?

0 Completely Dissatisfied 1 2 3 4 5 Moderately Satisfied 6 7 8 9 10 Completely Satisfied

How satisfied are you with your psychological health, emotions and mood in the past four weeks?

0 Completely Dissatisfied 1 2 3 4 5 Moderately Satisfied 6 7 8 9 10 Completely Satisfied

How satisfied are you with your ability to independently perform daily activities that bring you joy in the past four weeks?

0 Completely Dissatisfied 1 2 3 4 5 Moderately Satisfied 6 7 8 9 10 Completely Satisfied

Social Relationships and Social Isolation Section

How satisfied are you with your close relationships with friends and family in the past four weeks?

0 Completely Dissatisfied 1 2 3 4 5 Moderately Satisfied 6 7 8 9 10 Completely Satisfied

How satisfied are you with your ability to participate in activities that you enjoy with friends and family in the past four weeks?

0 Completely Dissatisfied 1 2 3 4 5 Moderately Satisfied 6 7 8 9 10 Completely Satisfied

How frequently have you felt socially isolated in the past four weeks?

0 Never 1 2 3 4 5 About half of the time 6 7 8 9 10 All the Time

How frequently have you felt socially excluded or left out in the past four weeks?

0 Never 1 2 3 4 5 About half of the time 6 7 8 9 10 All the Time

Influence of Adaptive Gaming Section

Gaming has had a significant positive influence on my quality of life:

1 Strongly Disagree | 2 Disagree | 3 Somewhat Disagree | 4 Neither Agree nor Disagree | 5 Somewhat Agree | 6 Agree | 7 Strongly Agree

Gaming has had a significant positive influence on my satisfaction with life and overall happiness:

1 Strongly Disagree | 2 Disagree | 3 Somewhat Disagree | 4 Neither Agree nor Disagree | 5 Somewhat Agree | 6 Agree | 7 Strongly Agree

Gaming has had a significant positive influence on my quality of social life and relationships:

1 Strongly Disagree | 2 Disagree | 3 Somewhat Disagree | 4 Neither Agree nor Disagree | 5 Somewhat Agree | 6 Agree | 7 Strongly Agree

Results

There was a total of 110 respondents who participated in the survey. The age of participants ranged from 18 to 60 years of age with an average age of 33.4. The majority of participants were male (93.6%) and the remainder reported as either female (5.5%) or other (0.9%). Spinal Cord Injury was the most frequently reported primary diagnosis (65.5%), with Muscular Dystrophy (15.5%) and Other (14.5%) as the second and third most common, respectively.

Figure 1 shows participant responses for the use of their adaptive gaming equipment. Two thirds of participants reported using their adaptive gaming equipment for activities other than just gaming (67.3%). This includes using it for computer access (61.8%), phone access or communication (23.6%), TV access (20.0%), and other activities (6.4%). Some of the activities that respondents entered into the "Other" category included school, computer programming, and work.

Individuals who reported using their adaptive gaming equipment for activities other than gaming had significantly higher Social Relationship scores (Table 1) compared to those who only use it for gaming (p=0.029 (95% CI)). Those who use their adaptive gaming equipment for activities other than gaming were also more likely to Agree or Strongly Agree that it has had a significant positive influence on their quality of life (+11.3%), satisfaction with life (14.1%), and social relationships (+21.5%) compared to those who use it for gaming alone (Figure 2). There was also a significant positive correlation between use of adaptive gaming equipment for additional activities and the composite Influence of Adaptive Gaming score (rs=0.21; p=0.013 (95% CI)) based on a Spearman's rank correlation analysis.

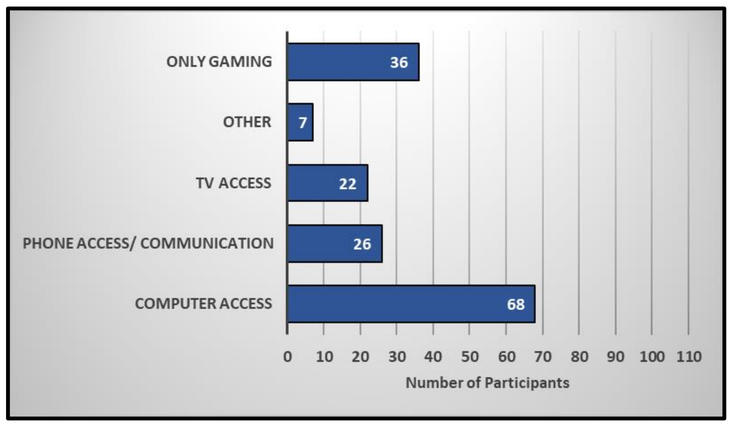

Figure 1: Participant responses for the use of their adaptive gaming equipment. Responses are shown as the number of participants using their equipment for each task from a total of 110 participants. More than one response was permitted in the survey for each participant.

Section	Use of Equipment: Only Gaming	Other Tasks
Quality of Life	6.44	6.44
	p=0.50	
Social Relationships	6.33	7.11
	*p=0.029**	
Social Isolation	5.63	5.78
	p=0.39	

Table 1: Comparison of Quality of Life, Social Relationships, and Social Isolation scores between those who use their adaptive equipment for tasks other than gaming and those who use their equipment for gaming alone.

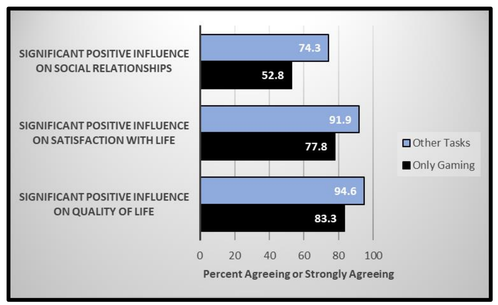

Figure 2: Comparison of the influence of adaptive gaming on quality of life, satisfaction with life, and social relationships between those who use their adaptive equipment for tasks other than gaming and those who use their equipment for gaming alone.

Discussion

Adaptive video gaming was shown to have a high translation to other tasks related to daily independence. This is reinforced by the finding that over two thirds of participants in this study use their adaptive gaming equipment for activities other than gaming (Figure 1). By integrating adaptive video gaming into other rehabilitation services aimed at increasing daily independence through the use of adaptive devices, participants may obtain greater overall benefits as outlined below.

Motivation

- Adaptive video gaming may introduce adaptive equipment in a form that is more motivational to users. This is significant, as a lack of motivation has been shown to lead to an abandonment of assistive technology devices.[5]

Skill

- Gaming may provide a means for developing skill with adaptive equipment, while minimizing frustration.

Outcomes

- Use of adaptive gaming equipment for tasks other than gaming was shown to contribute to greater overall outcomes for those participating in adaptive video gaming (Table 1 & Figure 2).

Independence

- Since use of adaptive equipment has been shown to be a positive predictor for return-to-work success for individuals with disabilities,[6] adaptive gaming may lead to long term vocational and educational benefits.

Conclusions/Future Research

The results from this study demonstrate that adaptive gaming is highly translational to tasks beyond gaming alone. Furthermore, introducing adaptive gaming equipment for tasks related to daily independence, in addition to gaming, may have greater overall benefits for participants. Studies showing the functional benefits of adaptive gaming may increase the overall acceptance of adaptive gaming in the rehabilitation field as well as increase funding options for adaptive gaming equipment.

Future research will be aimed at analyzing how the provision of adaptive gaming services within the rehabilitation environment increases patient outcomes through improvements in both quality of life and functional independence. Additionally, it may be interesting to compare levels of skill development with adaptive computer devices between those using equipment for gaming and those using it for computer access alone.

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