

Children's PIADS

(Psychosocial Impact of Assistive Devices Scale)

USER MANUAL

Table of Contents

Authors and Acknowledgements.....	2
Description of the Children's PIADS.....	3
Need and Rationale for the Children's PIADS.....	4
Development of the Children's PIADS.....	6
Psychometric Properties of the Children's PIADS.....	7
Administration Instructions for the Children's PIADS.....	8
Example Script for Each Item.....	9
Scoring the Children's PIADS.....	11
Interpreting Children's PIADS Scores.....	12
References.....	13
Appendix 1: Children's PIADS.....	15
Appendix 2: Children's PIADS Scoring Sheet.....	17
Appendix 3: Example Children's PIADS with Scoring Sheet.....	18

Authors and Acknowledgments

Robert Cunningham, PhD, OT/L, FAOTA

The following graduate student research projects have all contributed to the development of the Children PIADS.

“Impact of Assistive Technology Devices on Quality of Life: A Child-Parent Perspective”

- Maryville University Master's of Occupational Therapy Program 2014

Audra Dillingham, Jamie Laschke, Kelly Reinkemeyer, Michelle Scott, & Abigail Stahlschmidt

“Response Format and Terminology for a Children's Version of the Psychosocial Impact of Assistive Devices Scale (PIADS): A Preliminary Study”

- Maryville University Master's of Occupational Therapy Program 2015

Rebecca Morris, Lauren Seiler, Sarah Throm, Carly Watters, & Kelsey Wolken

“Psychosocial Impact of Assistive Devices Scale for Children: A Pilot”

- Maryville University Master's of Occupational Therapy Program 2016

Kaitlin Bethel, Megan Moldenhauer, Amanda Rzepczynski, Della Spratt, & Micaela Surdyke

“The Effect of Wheeled Mobility Devices on Children”

- Maryville University Master's of Occupational Therapy Program 2017

Marissa Bonney, Nadia Dawod, Amanda Lappe, Julia O'Brien, Sarah Pollock, & Lindsey Schweppe

“The Impact of Assistive Technology on Students to Aid the Process of Writing”

- Maryville University Master's of Occupational Therapy Program 2018

Shea Gabehart, Alyssa Haas, Alyx Holshouser, Allison Kennedy, Nicole Pruett, Elizabeth Rohde, & Natalie Witte

We would like to extend our thanks to Dr. Jeffrey Juati for his encouragement and assistance in pursuing this project. We are grateful to have the opportunity to add another version to the PIADS library.

Description of the Children's PIADS

The Children's PIADS, is a 15-item self-report questionnaire that utilizes a five point Smiley Face Likert-type scale and short phrases to assess the constructs of Competence, Adaptability, and Self-esteem. Please refer to Appendix 1 to see a full version of the Children's PIADS.

The Competence subscale is composed of 7 items that evaluate feelings of competency and efficacy through items related to productivity, usefulness, performance, and independence.

The Adaptability subscale includes 3 items that indicate a willingness to take risks and socially participate through items regarding ability to participate, willingness to take chances, and eagerness to try new things.

Self-esteem, the third subscale, includes 5 items that indicate feelings of emotional health and happiness through items related to security, sense of power, control, and self-confidence.

The Children's PIADS is an outcome measure that provides the assistive technology provider with the child's perspective of how the assistive technology is impacting them. This can be used to guide decisions on whether to continue use, try something else or stop assistive technology use.

Who Recommends Assistive Technology:

A variety of professionals work in the area of assistive technology. Occupational therapists, special educators, speech and language pathologists, and physical therapists are professionals who typically work in this area. Any individual associated with the process of providing assistive technology to children may utilize the Children's PIADS to assess the impact of the assistive technology.

Need and Rationale for the Children's PIADS

Assistive technology (AT) is defined as “devices, services, or strategies used to increase, maintain, or improve the functional capabilities of individuals with disabilities” (Assistive Technology Act of 1998). It is estimated that 49% of children with special health care needs would benefit from the use of assistive technology devices (ATDs) (Benedict & Baumgardner, 2009). The use of ATDs is a recognized approach for compensating for the deficits of children and adults with disabilities and increasing their independence (Scherer & Glueckauf, 2005). ATDs provide children with disabilities the opportunity to interact with their environment in an age appropriate manner and facilitate their ability to socialize, play, and actively participant in daily life (Nicolson, Moir, & Millsted, 2012; Hemmingsson, Lidstrom, & Nygard, 2004).

Outcome measures reflect the changes that ATDs produce in the lives of users and their environments and provide assistive technology professionals the opportunity to assess the impact of their services Lenker, Harris, Taugher, & Smith, (2013). Jutai, Fuhrer, Demers, Scherer & DeRuyter (2005) proposed a taxonomy for classifying ATD outcomes from three vantages: effectiveness, social significance, and subjective well-being. Effectiveness includes measures that assess the impact of ATDs on a user's functioning. Social significance includes the viewpoints that society has regarding AT devices including measures of cost and device utilization. Subjective well-being refers to the user's evaluation of how the ATD has affected their life (Jutai et al.). Viewing outcomes from this perspective illustrates the range of outcomes that can be assessed and the varying levels of importance that each may have to different stakeholders. Recognizing the variety of ATD outcomes that can be assessed and the implications of each speaks to the importance of implementing outcome measures that address the broadest range of measures possible to establish the effects of implementing ATDs (Jutai et al.).

An improvement in subjective well-being of an ATD user, as an outcome measure by itself, does not validate effectiveness but does contributes to the overall understanding of the ATD user's experience and satisfaction. Measures of subjective well-being include cognitive and affective assessments of how ATDs affect the life of the user (Fuhrer, 2000). Cognitive assessment is a measure of the user's satisfaction with a device from a number of perspectives while affective assessment evaluates the ability of ATDs to impact or influence subjective quality of life (QOL) (Fuhrer, 2000; Jutai, Fuhrer, Demers, Scherer, & DeRuyter 2005). QOL as it relates to ATDs is the user's assessment of the degree an ATD improves their ability to enjoy the important possibilities of their life (Renwick, Brown, & Raphael, 1994). Satisfaction with an AT device is a measure of the realities of using the device compared to the expectations and needs for the device. Satisfaction with an ATD is often reflected by the frequency with which an individual uses their device. Past studies indicate that negative perceptions of a device can lead to its abandonment, regardless of whether the device improves function and accessibility (Hemmingsson, Lidstrom, & Nygard, 2004; Riemer-Reiss, Wacker, 2000; Craddock, 2006). A

study investigating quality of life, self-esteem, and satisfaction with ATDs in students with disabilities found that although ATDs effectively improved function and accessibility, it left them with a sense of exclusion from their peers (Craddock, 2006). In a similar study of students using assistive technology for school related activities, researchers found that students demonstrated increased independence when using their AT devices but chose not to use them due to a perceived negative impact on their relationships with peers (Hemmingsson, Lidstrom, & Nygard, 2004).

While the literature supports the use of ATD's to contribute to increased function in children, little is known regarding how children perceive the impact these devices have on their subjective well-being. A factor contributing to this limited knowledge is the lack of ATD outcome measures designed for children to assess subjective well-being, particularly QOL. An adult outcome measure that does assess the impact of ATDs on QOL is the Psychosocial Impact of Assistive Devices Scale (PIADS) (Jutai & Day, 2002). The PIADS is a 26 item self-report questionnaire designed to measure the effects that an ATD has on functional independence, well-being, and QOL. It consists of three subscales: Competence, Adaptability, and Self-esteem (Jutai & Day). The PIADS was used as a model for the development of this instrument with the goal of aligning the constructs measured in adults with the language and unique perspective of children.

Development of the Children's PIADS

The Children's PIADS was developed over a six year period by five separate groups of occupational therapy graduate students and their research mentor Dr. Robert Cunningham. The initial study determined that the constructs associated with the PIADS were appropriate for children (Cunningham, Dillingham, Laschke, Reinkemeyer, Scott, & Stahlschmidt, 2014). The second study attempted to determine an appropriate response format and terminology for children (Cunningham, Morris, Seiler, Throm, Watters, & Wolken, 2015). Their findings provided the framework for the development of the Children's PIADS which was administered to children who wore eyeglasses or contact lenses to establish the instruments psychometric properties (Cunningham, Bethel, Moldenhauer, Rzepczynski, Spratt, & Surdyke, 2016). The final two groups (Cunningham, Bonney, Dawod, Lappe, Pollock, & Schweppe, 2017; Cunningham, Gabehart, Haas, Holshouser, Kennedy, Pruett, Rohde, & Witte, 2018) administered the Children's PIADS to children who used wheelchairs and assistive technology to aid with writing to further determine its psychometric properties.

Psychometric Properties of the Children's PIADS

Data from three different research groups administration of the Children's PIADS was combined to assess the reliability and validity of the tool's three constructs at time one (T1) and time two (T2). There was strong internal consistency among all constructs at T1 and T2. Cronbach's alpha scores for all constructs were reliable at or above the .7 level (Table 1). This indicates that questions under each construct are closely related to one another and accurately measure that construct. The Pearson correlation coefficient determined that test-retest reliability of the Children's PIADS was significant at the 0.88 level, meaning that the tool has the capability to produce consistent results across administrations.

Constructs	T1	T2
<i>Competence</i>	.78	.87
<i>Adaptability</i>	.75	.86
<i>Self-Esteem</i>	.81	.89

Table 1

Cronbach's alpha scores for the constructs competence, adaptability, and self-esteem at T1 and T2.

Administration Instructions for the Children's PIADS

Introductory Script:

(The examiner shall read this short introduction regarding the scale to the child in which they are administering the Children's PIADS on.)

"The questions you are about to answer will ask you how you feel about the technology that helps you with _____ (e.g. writing, reading, navigating the community). There are 19 questions total and they should take about five to ten minutes to answer. Try to answer them as honestly as possible about how you are affected by using your technology, **not** how you want to be affected."

What to say if they don't want to answer a question or if they don't know how to answer a question:

If the child does not know how to answer the question, prompt them with the examples on the following page. If he/she still does not know how to respond to a question or refuses to answer, move on to the next question. If the child shows signs of distress when answering a question, inform them that he/she does **not** have to answer that question.

Additional Information:

- Children may respond to these questions using technology, stating answers, or pointing to answers.
- There are 15 questions with 5 options for each response, the child should choose only **one** answer per question.

Example Script for Each Item

(The examiner should ONLY utilize these examples if the child does not know how to answer an item, or does not understand what an item is asking. As the examiner, you may use these prompts to help the child understand the item in different terms. Read the following prompts exactly without additional wording or information.)

- 1. Makes it easier for me to do things:** Does your technology make it easier for you to do things that were difficult, or that you were unable to do without using this technology?
- 2. Allows me to show my talents:** Does your technology help you show others what you are good at?
- 3. Lets me do more things:** Does your technology let you do things that were difficult for you to do, or that you were unable to do without using this technology?
- 4. Helps me do things well:** Does your technology help you do things that were difficult for you to do, or you were unable to do without using this technology?
- 5. Makes me feel safe:** Does your technology help you feel comfortable in everyday activities?
- 6. Helps me feel okay:** Does your technology help you feel good with the way you do things?
- 7. Gives me hope:** Does your technology help you believe you can complete the activities you want to do?
- 8. Helps me do things on my own:** Does your technology help you do things without the help from another person that were difficult for you to do, or that you were unable to do by yourself without using this technology?
- 9. Makes me want to try new things:** Does your technology push you to try things that may have been difficult for you to try, or that you were unable to try without the use of this technology?
- 10. Makes me feel happy:** Does using your technology help you to be in a good mood?
- 11. Helps me feel in control:** Does your technology help you be in charge of your everyday activities?
- 12. Is helpful to me:** Does your technology help you do your everyday activities?

13. Makes me feel good about myself: Does your technology allow you to feel happy about yourself?

14. Makes my life better: Does your technology make life enjoyable?

15. Helps me try new things: Does your technology help you start things that may have been difficult for you to try, or unable to try without the use of this technology?

Scoring the Children's PIADS

After the Children's PIADS has been completed, convert the child's responses into a numerical value by following the steps below and filling out the scoring sheet. See **Appendix 2** for the scoring sheet. For further information, see the example Children's PIADS with scoring sheet in **Appendix 3**.

Likert-Type Smiley Scale Response	Score
"Never"	1
"Almost Never"	2
"Sometimes"	3
"Almost Always"	4
"Always"	5

To fill out the scoring sheet, circle the response's numerical value in correspondence with the correct item number. ***Be careful, items are not in numerical order on the scoring sheet - they are listed within the construct they measure. Be sure to circle the correct numerical response with the correct item number.**

After you convert the Likert-type Smiley Face Scale answers into numerical response, add each score together to get an overall score.

You may also add up the numerical responses for questions within each construct (Competence, Adaptability, and Self-Esteem) of the Children's PIADS:

- The Competence subscale is derived by adding the values corresponding to items 1, 2, 3, 4, 8, 12, and 14
- The Adaptability subscale is derived by adding the values corresponding to items 6, 9, and 15
- The Self-Esteem subscale is derived by adding the values corresponding to items 5, 7, 10, 11, and 13

Interpreting the Children's PIADS Scores

After you have converted the Likert-type Smiley Face Scale answers into numerical responses on the scoring sheet, you can analyze the overall scores to determine the psychosocial impact of the assistive device.

Interpreting score by construct:

Competence

- Highest Possible Score: 35
- Lowest Possible Score: 7
 - 7-13 Poor
 - 14-20 Fair
 - 21-27 Good
 - 28-35 Excellent

Adaptability

- Highest Possible Score: 15
- Lowest Possible Score: 3
 - 3-5 Poor
 - 6-8 Fair
 - 9-11 Good
 - 12-15 Excellent

Self-Esteem

- Highest Possible Score: 25
- Lowest Possible Score: 5
 - 5-9 Poor
 - 10-14 Fair
 - 15-19 Good
 - 20-25 Excellent

Interpreting overall score:

- Highest Possible Score: 75
- Lowest Possible Score: 15
 - 15-29 Poor
 - 30-44 Fair
 - 45-59 Good
 - 60-75 Excellent

References

- Assistive Technology Act, 29 U.S.C. as amended, 29 U.S.C. § 3001 (1998 & Supp. 2004).
- Benedict, R. E. & Baumgardner, A. M. (2009). A population approach to understanding children's access to assistive technology. *Disability and Rehabilitation, 31*(7), 582-592.
- Craddock, G. (2006). The AT continuum in education: Novice to power user. *Disability and Rehabilitation: Assistive Technology, 1*(1/2), 17-27.
- Cunningham, R., Bethel, K., Moldenhauer, M., Rzepczynski, R., Spratt, D., & Surdyke, M. (2016). *Psychosocial impact of assistive devices scale for children: A pilot*. Unpublished manuscript, Department of Occupational Therapy, Maryville University, St. Louis, Missouri.
- Cunningham, R., Bonney, M., Dawod, N., Lappe, A., O'Brien, J., Pollock, S., Schweppe, L. (2017). *The effect of wheeled mobility devices on children*. Unpublished manuscript, Department of Occupational Therapy, Maryville University, St. Louis, Missouri.
- Cunningham, R., Dillingham A., Laschke, J., Reinkemeyer, K., Scott, M., & Stahlschmidt, A. (2014). *Impact of assistive technology devices on quality of life: A child-parent perspective*. Unpublished manuscript, Department of Occupational Therapy, Maryville University, St. Louis, Missouri.
- Cunningham, R., Gabehart, S., Haas, A., Holshouser, A., Kennedy, A., Pruett, N., Rohde, E., & Witte, N. (2018). *The impact of assistive technology on student to aid the process of writing*. Unpublished manuscript, Department of Occupational Therapy, Maryville University, St. Louis, Missouri.
- Cunningham, R., Morris, R., Seiler, L., Throm, S., Watters, C., & Wolken, K. (2015). *Response format and terminology for a children's version of the Psychosocial Impact of Assistive Devices Scale (PIADS): A preliminary study*. Unpublished manuscript, Department of Occupational Therapy, Maryville University, St. Louis, Missouri.
- DeRuyter, F. (1997). The importance of outcome measures for assistive technology service delivery systems. *Technology and Disability, 6*, 89-104.
- Fuhrer, M. J., Jutai, J. W., Scherer, M. J., Deruyter, F. (2003). A framework for the conceptual modeling of assistive technology device outcomes. *Disability and Rehabilitation, 25*(22), 1243-1251.

- Hemmingsson, H., Lidstrom, H., & Nygard, L. (2009). Use of assistive technology devices in mainstream schools: Students' perspective. *American Journal of Occupational Therapy, 63*, 463-472.
- Jutai, J., & Day, H. (2002). Psychosocial Impact of Assistive Devices Scale (PIADS). *Technology and Disability, 14*(3), 107-111.
- Jutai, J. W., Fuhrer, M. J., Demers, L., Scherer, M. J., & DeRuyter, F. (2005). Toward a taxonomy of assistive technology device outcomes. *American Journal of Physical Medicine & Rehabilitation, 84*(4), 294-302.
- Lenker, J. A., Harris, F., Taugher, M., & Smith, R. O. (2013). Consumer perspectives on assistive technology outcomes. *Disability and Rehabilitation: Assistive Technology, 8*(5), 373-380.
- Nicolson, A., Moir, L., & Millstead, J. (2012). Impact of assistive technology on family caregivers of children with physical disabilities: A systematic review. *Disability Rehabilitation Assistive Technology, 7*(5), 345-349.
- Renwick R, Brown I, & Raphael D. (1994). Quality of life: Linking a conceptual approach to service provision. *Journal of Developmental Disabilities, 3*, 32-44.
- Riemer-Ross, M. L., & Wacker, R. R. (2000). Factors associated with assistive technology discontinuance among individuals with disabilities. *Journal of Rehabilitation, 66*(3), 44-59.
- Scherer, M.J., & Glueckauf, R. (2005). Assessing the benefits of assistive technologies for activities and participation. *Rehabilitation Psychology, 50* (2), 132-141.

Appendix 1 - Children's PIADS Tool

Children's

PIADS









































(Psychosocial Impact of Assistive Devices Scale)

Name: _____ **Age:** _____

Date: _____ **Gender:** M / F

Directions: Mark the face that matches how you feel when you use your technology.

Please list the technology device/software that you use: _____

1) Makes it easier for me to do things	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
2) Allows me to show my talents	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
3) Lets me do more things	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
4) Helps me do things well	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
5) Makes me feel safe	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
6) Helps me feel okay	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
7) Gives me hope	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
8) Helps me do things on my own	 Never	 Almost Never	 Sometimes	 Almost Always	 Always

9) Makes me want to try new things					
	Never	Almost Never	Sometimes	Almost Always	Always
10) Makes me feel happy					
	Never	Almost Never	Sometimes	Almost Always	Always
11) Helps me feel in control					
	Never	Almost Never	Sometimes	Almost Always	Always
12) Is helpful to me					
	Never	Almost Never	Sometimes	Almost Always	Always
13) Makes me feel good about myself					
	Never	Almost Never	Sometimes	Almost Always	Always
14) Makes my life better					
	Never	Almost Never	Sometimes	Almost Always	Always
15) Helps me try new things					
	Never	Almost Never	Sometimes	Almost Always	Always

16. How often do you use your technology?

- 3-5 days a week
- 1-2 days a week
- Less than one day a week

17. How much assistance do you require to use your technology?

- None - I use it on my own
- Some - I use it with some help
- A lot - Someone helps me use it

18. How do you feel about the technology?

- I like it
- It's OK
- I don't like it

19. Do you want to continue using your technology?

- Yes
- Maybe
- No

Appendix 2 - Children's PIADS Scoring Sheet

Name:			Date:		
	"Never"	"Almost Never"	"Sometimes"	"Almost Always"	"Always"
COMPETENCE					
Item 1	1	2	3	4	5
Item 2	1	2	3	4	5
Item 3	1	2	3	4	5
Item 4	1	2	3	4	5
Item 8	1	2	3	4	5
Item 12	1	2	3	4	5
Item 14	1	2	3	4	5
Competence Total:					
ADAPTABILITY					
Item 6	1	2	3	4	5
Item 9	1	2	3	4	5
Item 15	1	2	3	4	5
Adaptability Total:					
SELF-ESTEEM					
Item 5	1	2	3	4	5
Item 7	1	2	3	4	5
Item 10	1	2	3	4	5
Item 11	1	2	3	4	5
Item 13	1	2	3	4	5
Self-Esteem Total:					
TOTAL from the 3 Constructs:					









































Appendix 3 - Example of Children's PIADS with Scoring

Children's PIADS

Psychosocial Impact of Assistive Devices Scale

Name: JOHN S. Age: 7
 Date: 3-5-19 Gender: M / F

Directions: Mark the face that matches how you feel when you use your technology.
 Please list the technology device/software that you use: co-writer

1) Makes it easier for me to do things	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
2) Allows me to show my talents	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
3) Lets me do more things	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
4) Helps me do things well	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
5) Makes me feel safe	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
6) Helps me feel okay	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
7) Gives me hope	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
8) Helps me do things on my own	 Never	 Almost Never	 Sometimes	 Almost Always	 Always

9) Makes me want to try new things	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
10) Makes me feel happy	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
11) Helps me feel in control	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
12) Is helpful to me	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
13) Makes me feel good about myself	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
14) Makes my life better	 Never	 Almost Never	 Sometimes	 Almost Always	 Always
15) Helps me try new things	 Never	 Almost Never	 Sometimes	 Almost Always	 Always

16. How often do you use your technology?

- 3-5 days a week
- 1-2 days a week
- Less than one day a week

17. How much assistance do you require to use your technology?

- None - I use it on my own
- Some - I use it with some help
- A lot - Someone helps me use it

18. How do you feel about the technology?

- I like it
- It's OK
- I don't like it

19. Do you want to continue using your technology?

- Yes
- Maybe
- No

Name: <i>John S.</i>			Date: <i>3-5-18</i>		
	"Never"	"Almost Never"	"Sometimes"	"Almost Always"	"Always"
COMPETENCE					
Item 1	1	2	3	4	⑤
Item 2	1	2	3	4	⑤
Item 3	1	2	3	④	5
Item 4	1	2	3	④	5
Item 8	1	2	3	4	⑤
Item 12	1	2	3	4	⑤
Item 14	1	2	3	④	5
Competence Total: <i>32 (excellent)</i>					
ADAPTABILITY					
Item 6	1	2	3	4	⑤
Item 9	1	2	③	4	5
Item 15	1	2	3	4	⑤
Adaptability Total: <i>13 (excellent)</i>					
SELF-ESTEEM					
Item 5	1	2	3	④	5
Item 7	1	2	3	④	5
Item 10	1	2	3	④	5
Item 11	1	2	3	4	⑤
Item 13	1	2	3	④	5
Self-Esteem Total: <i>21 (excellent)</i>					
TOTAL from the 3 Constructs:		<i>66 (excellent)</i>			