

# Acceptability of Accelerometers to Measure the Physical Activity of Preschool Children

in the Children's Healthy Living Program (CHL) in Hawai'i

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# Physical activity (PA)

## Important determinant of health

- \* Inactivity -- risk factor
- \* More children -- overweight / Type II diabetes
- \* Behavior patterns begin early in life
- \* Programs, like CHL, aim to increase PA in young children
- \* How to measure program success in young children?
- \* Need objective measure of PA for program impact
- \* Accelerometers are objective measure (Guimarães Vale et al, 2010; Sirard & Pate, 2001)

# **\*Research Questions**

**Will preschool-age children wear  
Accelerometers?**

**How acceptable are they to  
children?**

**What problems might arise?**

The background is a solid blue color. In the upper half, there are several overlapping, wavy white lines that create a sense of movement and depth, resembling a stylized horizon or a series of hills.

**\*How to improve acceptance of them by preschool children?**

# Accelerometer



# What is an Accelerometer?

- \* Objective measure of physical activity (PA)
- \* Measures vertical, horizontal, and lateral acceleration
- \* Produces output on intensity, duration and frequency of PA throughout day
- \* Intensity -- Measures from sleep to vigorous
- \* Cost over \$200

# Hawai'i Sample

Head Start site	Number of Children
Site A	17
Site B	16
Site C	18
Total	51 (of 55 possible)



# Ethnicity / Race of Sample

## 100% Single Ethnic Group (13)

Asian	
Filipino	5
Chinese	4
Other	1
Pacific Islander	
African American	
	2
	1

## Mixed Ethnicity (36)

Hawaiian & Other Mix	23
Hawaiian + 2 groups (11), + 3 groups (8) of White, Asian, Hispanic, &/or PI	
Pacific Islander Mix (not Hawaiian)	6
Asian & White	6
Asian (two Asian ethnicities)	1
Unknown heritage or no data	2
Total Sample	51



# Methods

Wore accelerometer for two 1-week periods

- \* Tracking of Wearing Accelerometer and Comments

- \* Child's Daily Experience

- \* Parent Feedback

- \* Staff available in class



# Placement of accelerometers

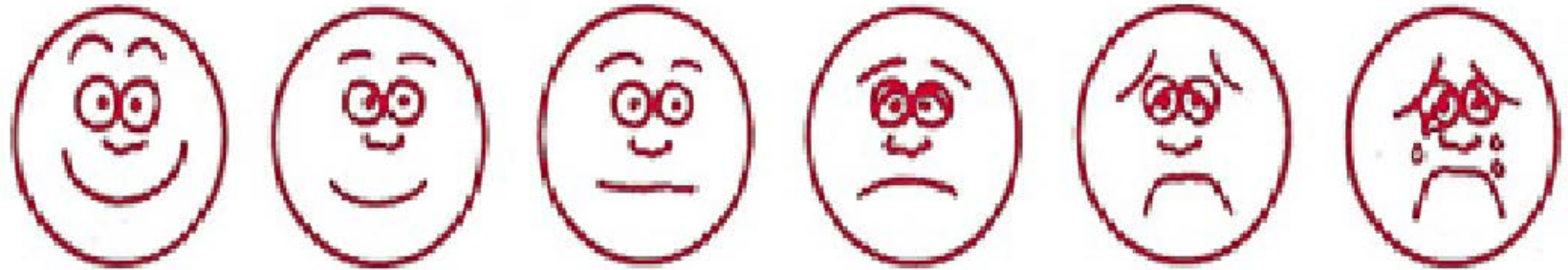
(non-dominant)



\* Child gave assent

\* Child chose color of wristband

# Child's Daily Experience



Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

CHL Physical Activity Pilot Project

# Feedback Questionnaire Week 2

## 1. My child liked wearing the accelerometer

*Please circle the number that most reflects your child's experience over the 7 days of wearing the accelerometer.*

1	2	3	4	5	6	7	8	9	10
Strongly disagree									Completely agree

## 2. My child felt that wearing the accelerometer was

*Please check ALL that apply:*

- |                                            |                                                                |
|--------------------------------------------|----------------------------------------------------------------|
| <input type="checkbox"/> Easy              | <input type="checkbox"/> Something important                   |
| <input type="checkbox"/> Terrible          | <input type="checkbox"/> Heavy                                 |
| <input type="checkbox"/> Annoying          | <input type="checkbox"/> Something he/she liked                |
| <input type="checkbox"/> Disturbing        | <input type="checkbox"/> Interesting, asked questions about it |
| <input type="checkbox"/> Distracting       | <input type="checkbox"/> Made him/her feel like a grown up     |
| <input type="checkbox"/> Barely noticeable | <input type="checkbox"/> Tried to play with it                 |
| <input type="checkbox"/> OK                | <input type="checkbox"/> Tried to take it off                  |
| <input type="checkbox"/> Fun               | <input type="checkbox"/> Tried to break it                     |
| <input type="checkbox"/> Difficult         |                                                                |

Other \_\_\_\_\_



# Results

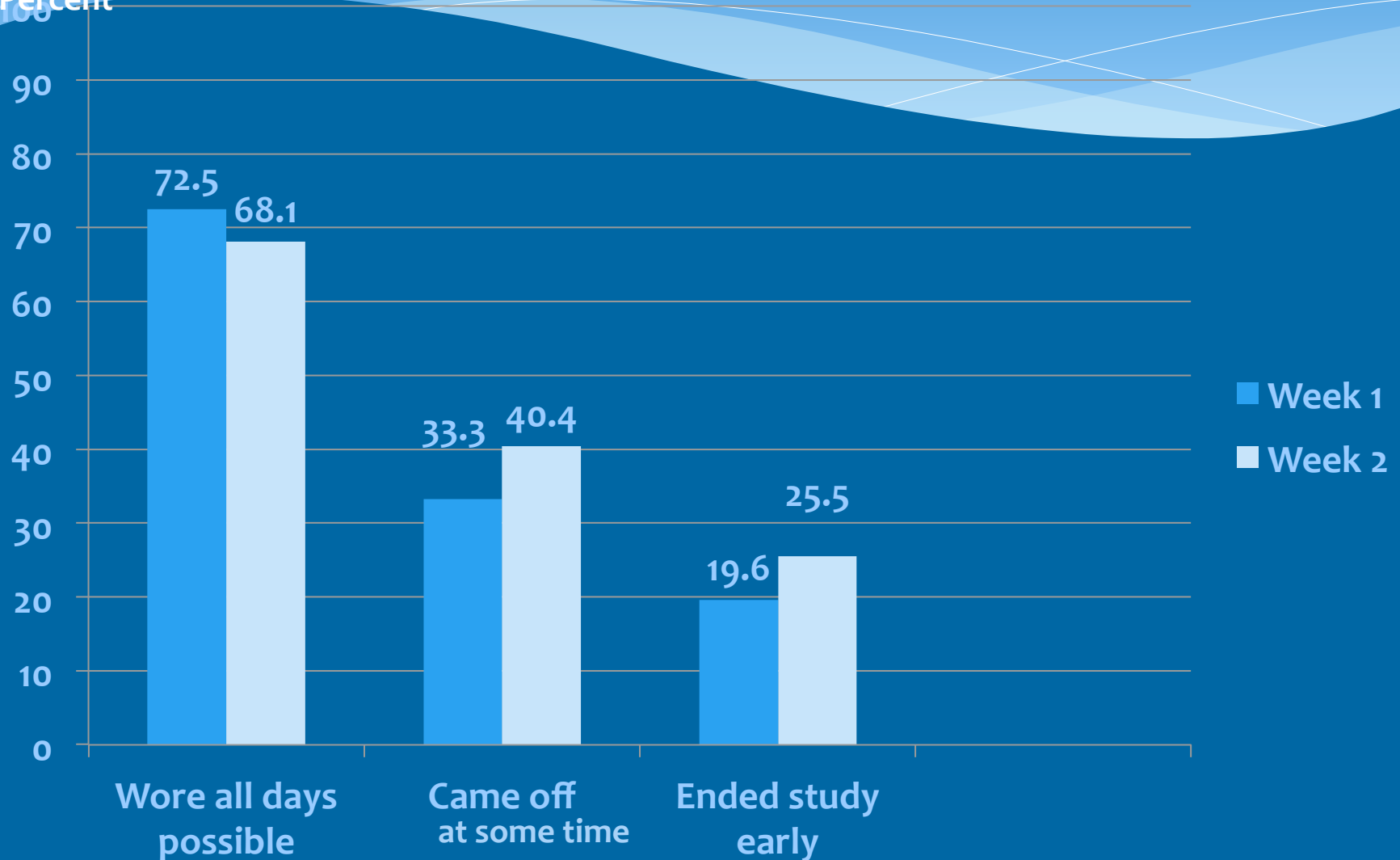


# # Children wore Accelerometers

	Week 1	Week 2
<b>Children Starting Study Week</b>	<b>51</b>	<b>47</b>
<b>Wore accelerometers less than 1 day</b>	<b>2*</b>	<b>3</b>
<b>Lost accelerometers</b> *counted in both categories	<b>1*</b>	<b>1</b>

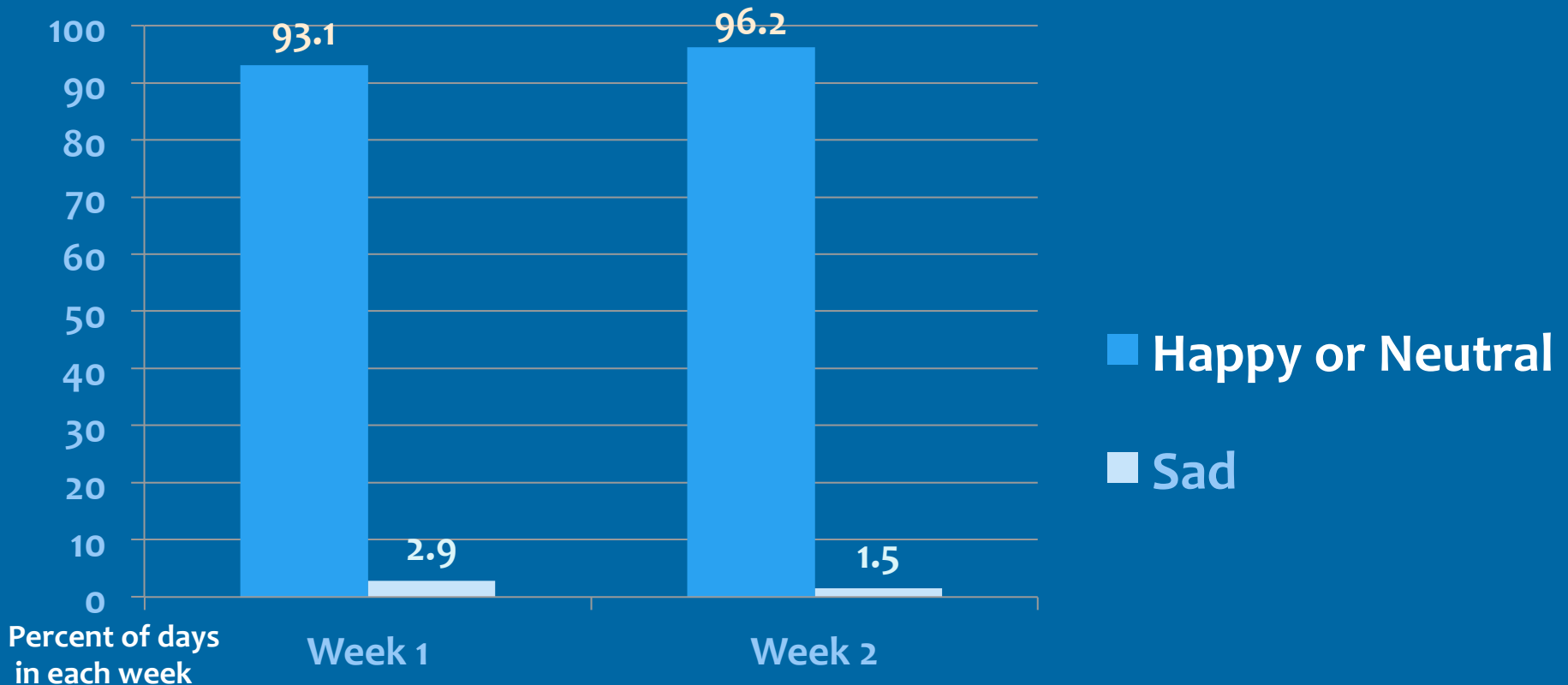
# Children Wore Accelerometers

Percent



# Child's Daily Experience Wearing Accelerometer

## Parents' daily rating





# Parent Feedback Form

My child liked wearing the accelerometer:

\* 1 strongly disagree to 10 completely agree

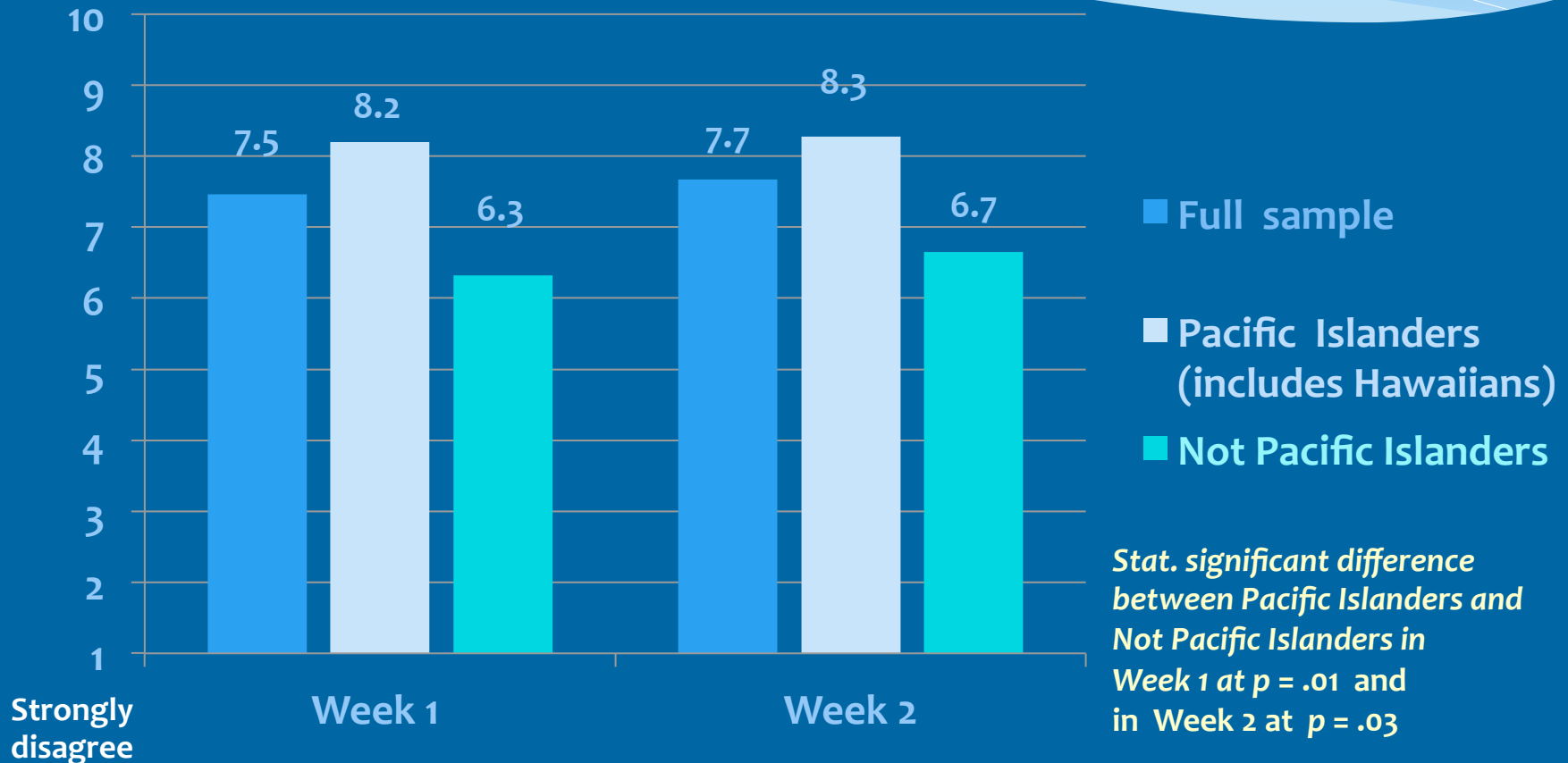
\* Week 1: 7.5

\* Week 2: 7.7



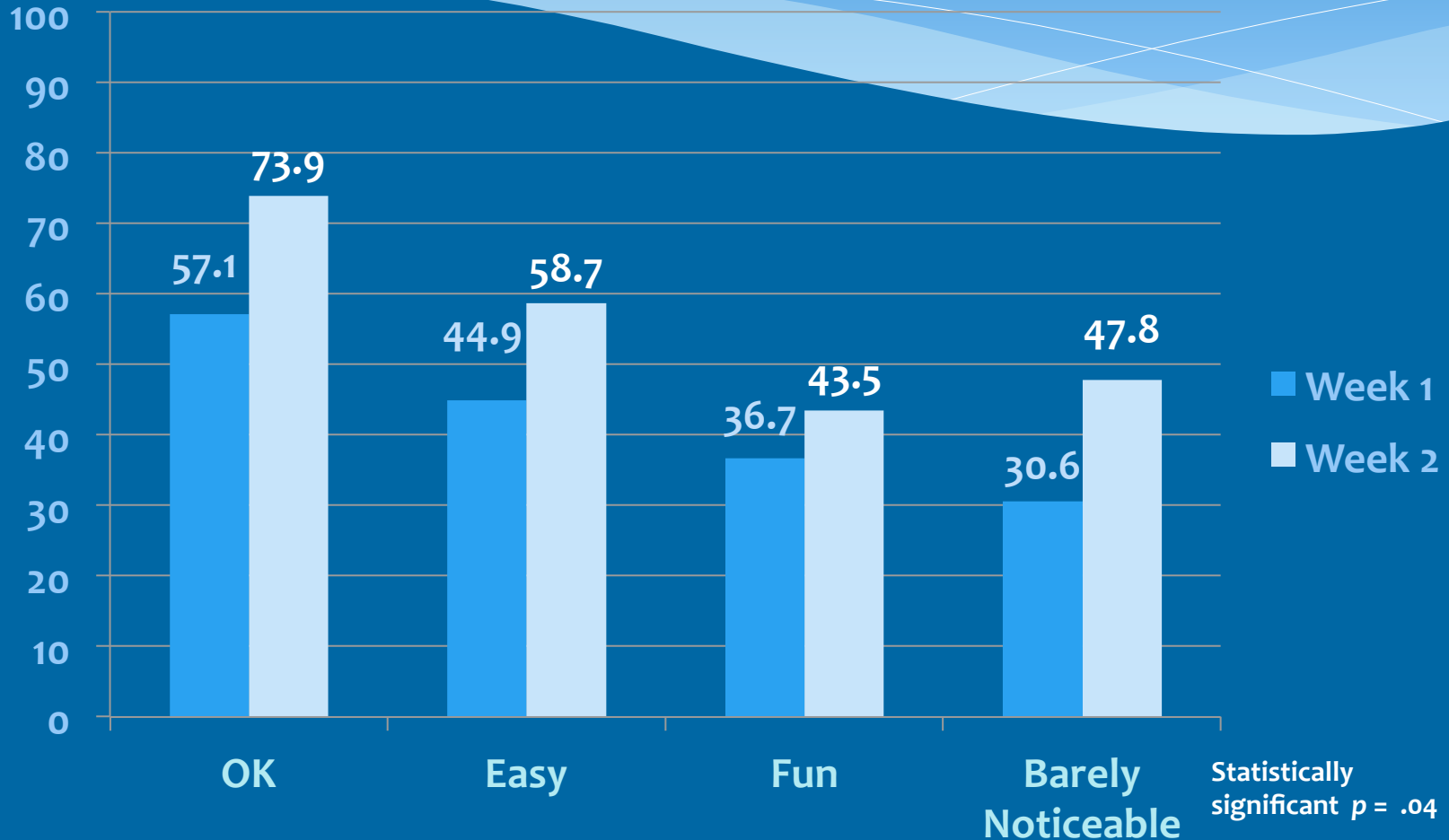
# My child liked wearing accelerometer Parent Feedback Form

Completely  
agree



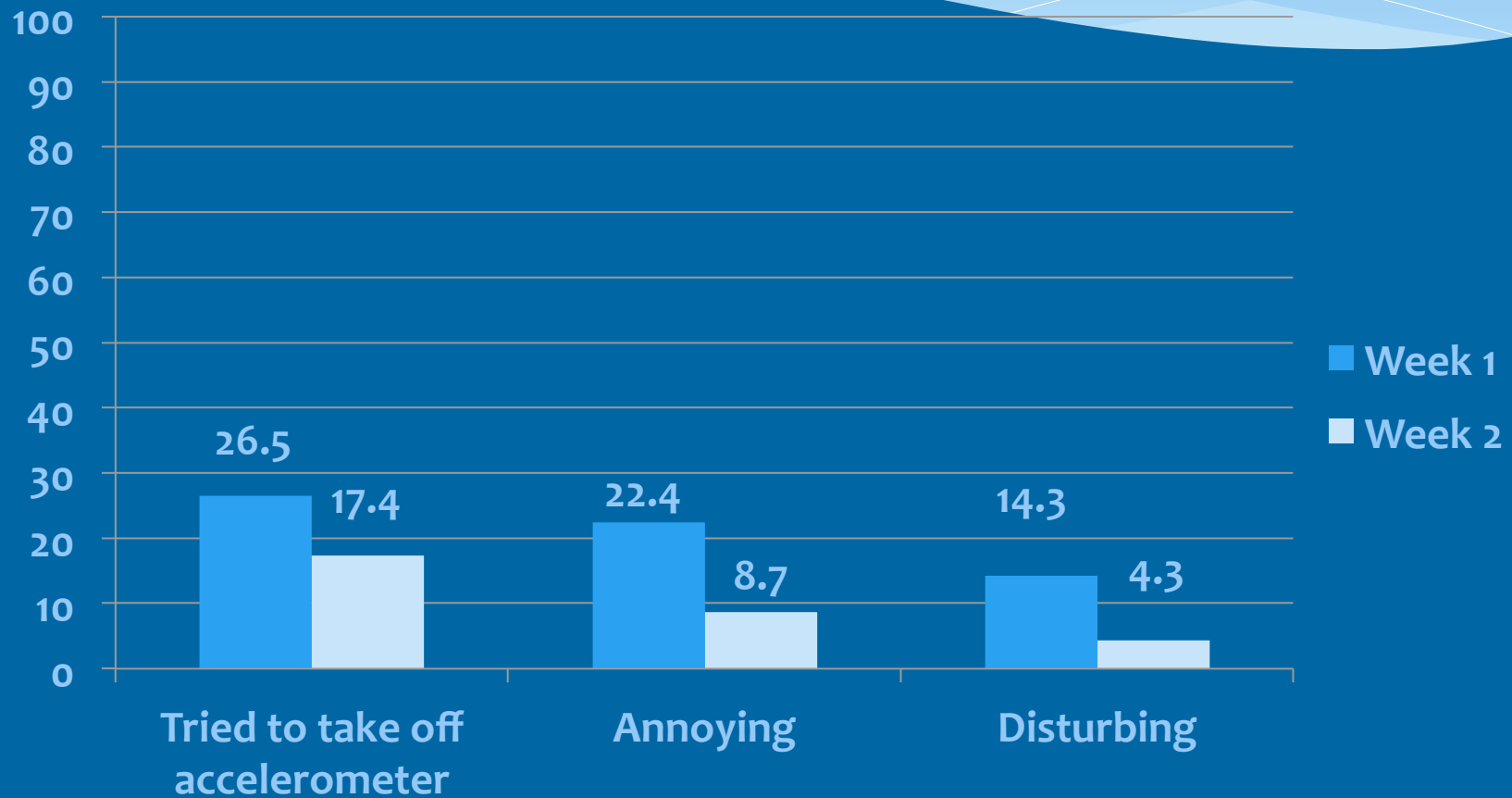
# Child's Experience of Accelerometer

percent



# Child's Experience of Accelerometers

percent



# Ways to improve acceptance of wearing accelerometers

- \* Provide FAQs
- \* Educate parents, teachers, and staff about what to expect
- \* Train them how to remedy common concerns

# Educate Parents / Staff / Teachers about What to Expect

- \* Child likely will get used to it, and notice it less over time
- \* Child may focus on accelerometer at first
- \* Child may experience some discomfort at first

# How to remedy if child is bothered or uncomfortable

## Training for Parents / Staff / Teachers

- \* Examine wrist and wristband fit
- \* Ask “How does it feel?”
- \* Wash and dry wrist and device, if needed
- \* Put a new band, if needed

### Rare:

- \* If actual sore, broken skin, rash – tell designated person / IRB

# Strategies to Improve Acceptance

## What to ask if a child Is not wearing accelerometer

- \* Ask parent(s) for information
- \* Ask child why it was removed and then listen
- \* “Would you like me to put this back on for you, maybe with a different color?”



# Strategies to Improve Acceptance

## \* Give Attention / Reassure Child

- \* Tried to alleviate problems and reassure
- \* Children appreciated attention, that we cared about how they felt
- \* Would tell them, “Please come see me if it bothers you, OK?”
- \* Children had the right at anytime to choose not to wear device

# Tip about changing wristbands

- \* Changing a wristband attracted attention of children
- \* Soon, many children would “need” their wristbands changed sometimes to a different color.
- \* Try Not to attract attention
- \* Began changing wristbands when needed:
  - \* Before class
  - \* While other children were occupied in activity
  - \* At beginning of recess

# Recommendations to improve acceptance of accelerometers by preschoolers

- \* Place accelerometers on children early in week (when peers, staff and/ or teachers present)
- \* Use comfortable, durable wrist bands
- \* Examine, Change band and /or reassure
- \* Offer opportunity to put it on again

# Research Recommendation

- \*Over-enroll children into study to make up for children who take off accelerometer early

# Conclusion

- \* It is feasible to use accelerometers with preschool-age children
  - \* as objective measure of physical activity
- \* Some factors improve acceptance of accelerometers by preschool-age children

# Acknowledgements

## Mahalo nui loa

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\* Thank you!

\* What questions do you have?

