



School of Physical and
Occupational Therapy

EXCELLENCE THROUGH GROWTH

Improving participation through the PREP intervention: Current evidence

CHILD Research Meeting
JÖNKÖPING UNIVERSITY
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Today's agenda

- Introduce PREP
- Share evidence of the effectiveness of the PREP
- Discussion

Improving participation

Generalizability effect

Parents and therapists' perspectives

Impact of body- functions

Impact on Young children



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What is PREP?



- 12-week **client-centered**, environment-based approach
- Focuses on **3** chosen goals/activities
- Focuses on modifying a client's natural **environment** and/or the activity
- Therapist **collaborates** with the client and family to identify and implement solution-based strategies to remove environmental barriers
- Therapist engages and **coaches** youth/parent, as well as other service providers

Building a 'Participation Team'!



Aspects of the environment

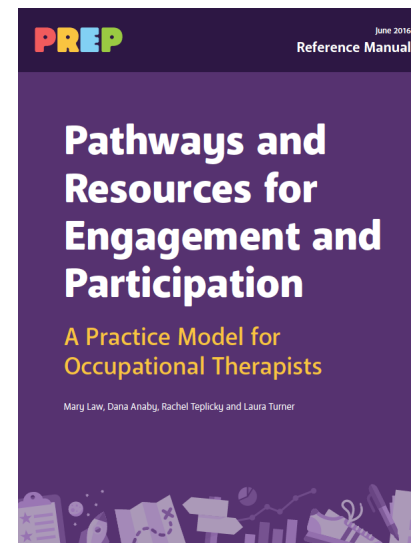
- **Physical** (e.g., built environment, accessibility)
- **Social** (e.g., social support, peer support)
- **Attitudinal** (e.g., perceptions towards disability and recreation)
- **Familial** (e.g., family functioning)
- **Institutional** (e.g., policies, availability of programs)
- **Temporal** (e.g., schedule, season, school holidays)



What steps involved in the PREP?

5 M-Steps:

- **M**ake goals
- **M**ap out a plan
- **M**ake it happen
- **M**easure the process and outcomes
- **M**ove forward



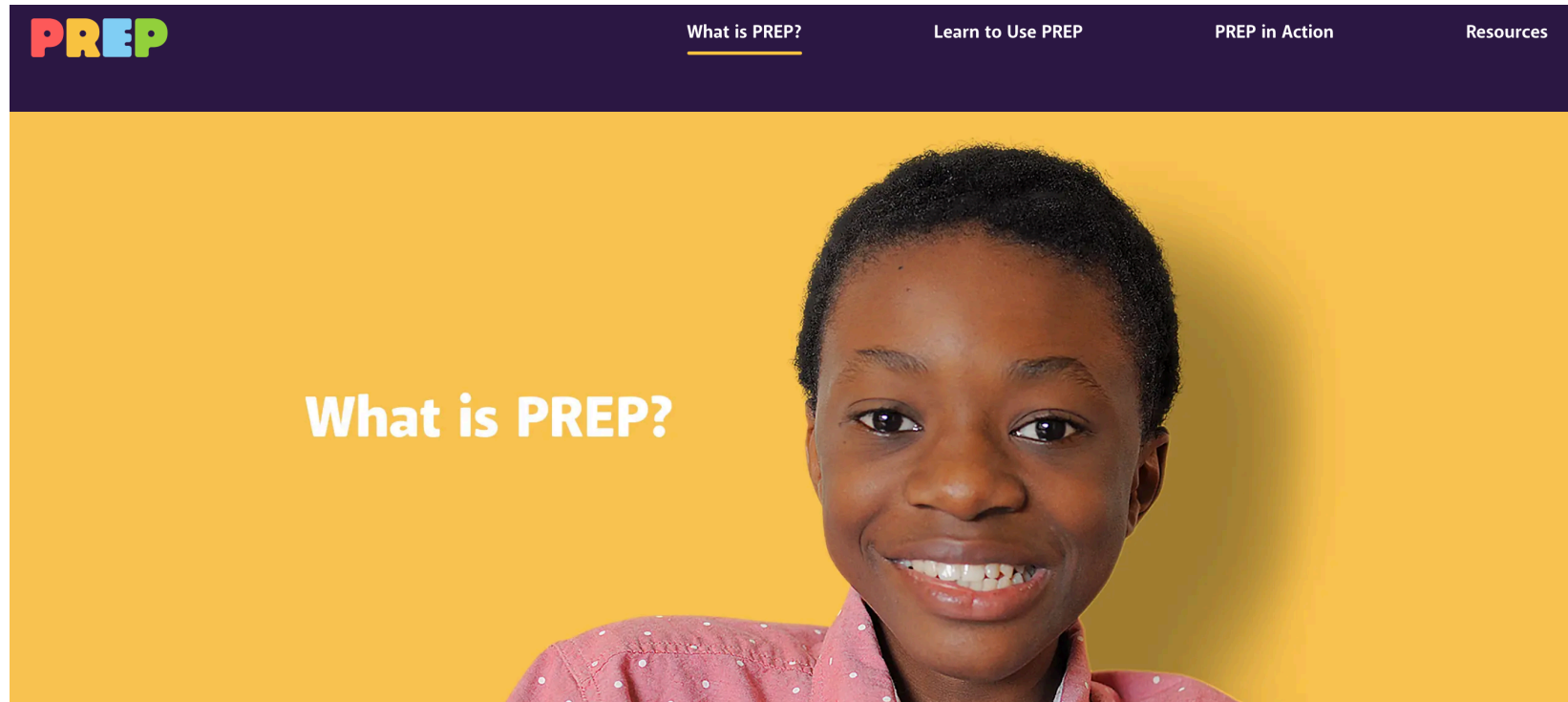
The PREP intervention protocol is now available on the CanChild website: <https://www.canchild.ca/en/shop/25-prep>



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PREP[©] e-module is launched!



<https://www.prepintervention.ca>

Anaby et al., 2019



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What evidence supports PREP?

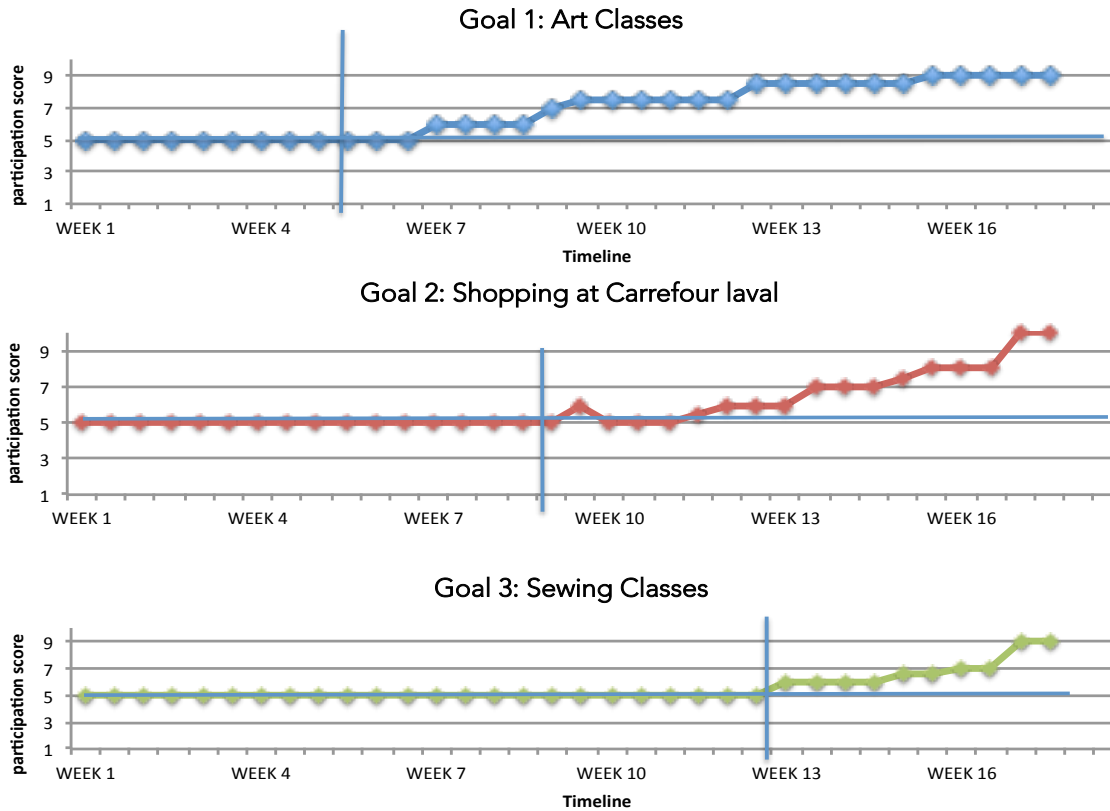
- PREP improves and maintains levels of participation (Anaby et al., 2018)
- PREP has a **ripple effect** – It can impact overall participation patterns (Anaby et al., 2019; Hoehne et al., 2020)
- PREP is positively perceived by both **parents** (Anaby et al., 2015) and **therapists** (Anaby et al., 2017)
- PREP can improve outcomes at the **body-function** level (motor, cognitive, affective) (Anaby et al., 2020)



Improving and maintaining levels of Participation

- 28 youth (14 females) ages 12 to 19 years (mean=14.6, SD=1.8)
- Youth had moderate physical disabilities (67.6 based on the ASK) and a range of functional issues (mean=6.7, SD=2.9)
- Each youth set 3 participation goals
- Interrupted Time Series Design (Anaby et al., 2014)
- Goal performance was measured twice a week using the COPM (32 data points per goal)
- The performance of 79 goals were analyzed using Segmented Regression and HLM

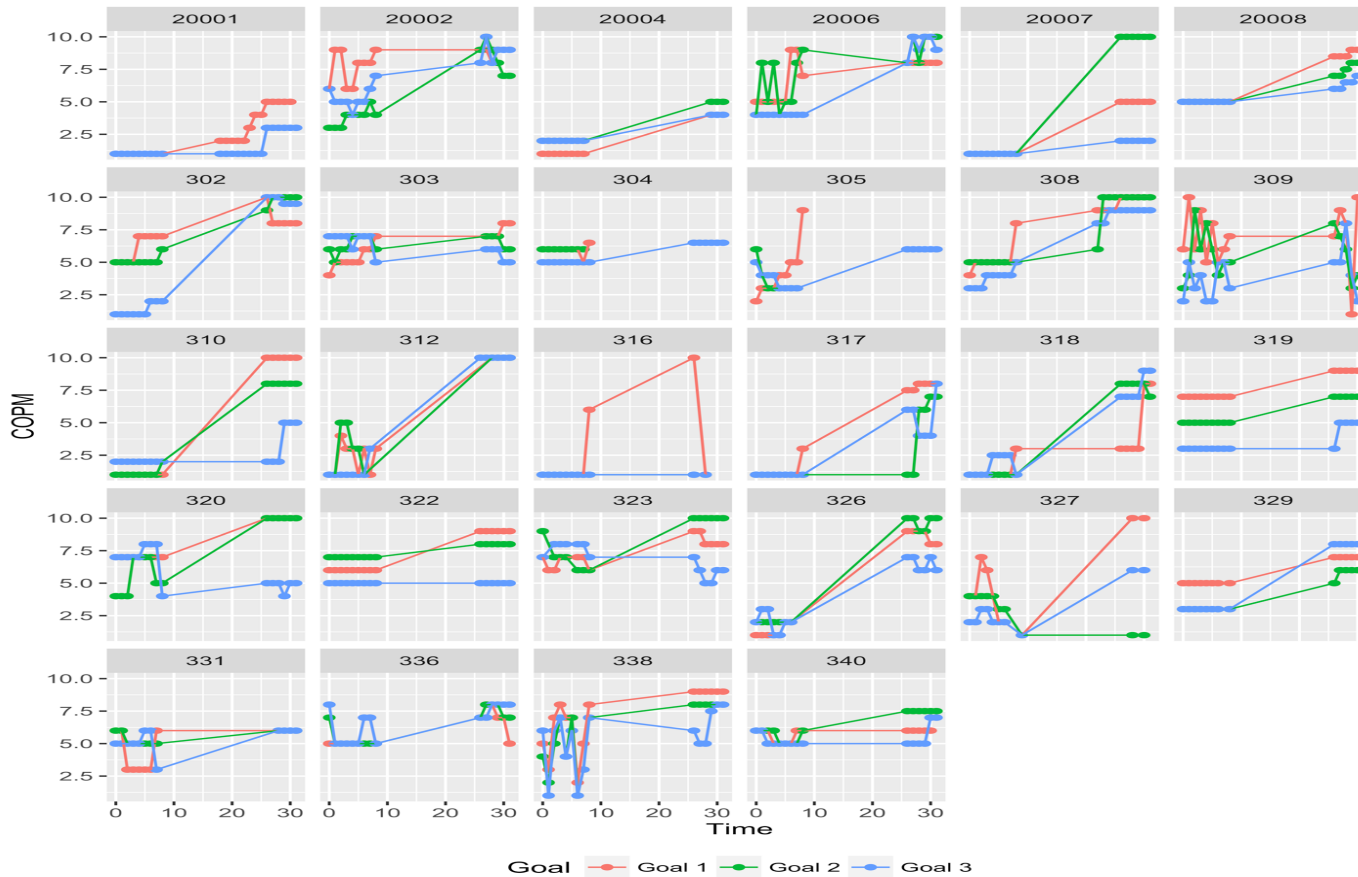
PREP can improve and maintain levels of participation



X 28

Anaby et al., 2018

PREP Results – across 79 goals



PREP Results

- A positive and statistically significant treatment effect ($B=2.08$, $p<0.0001$) was observed across 28 youth activities/goals ($n=79$)
- An average improvement of more than 2 points on the COPM performance scale was observed indicating a clinically significant change
- Improvements in COPM scores were maintained at 20-week follow-up
- Intervention effect seems to be larger for males and those with a higher number of functional issues

Anaby et al., 2018

PREP has a ripple effect



PREP has a ripple effect



X New activity Done

What are you doing?

lunch x watch TV/Dvd/ streaming x

Where are you?

home x

With whom?

sister x

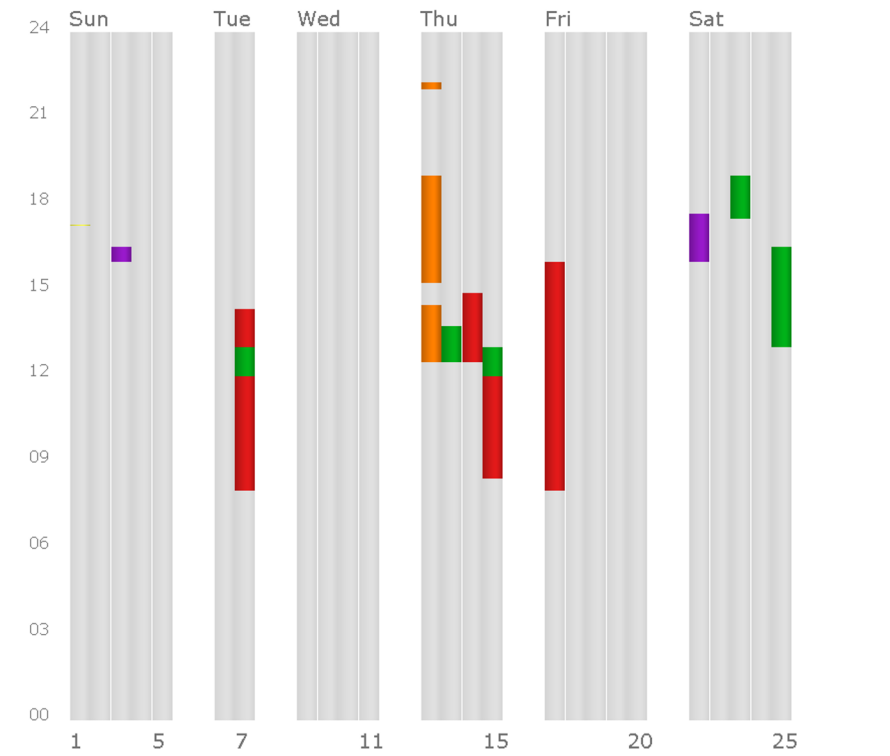
How are you feeling?

☹️ 😞 😐 😊 😄

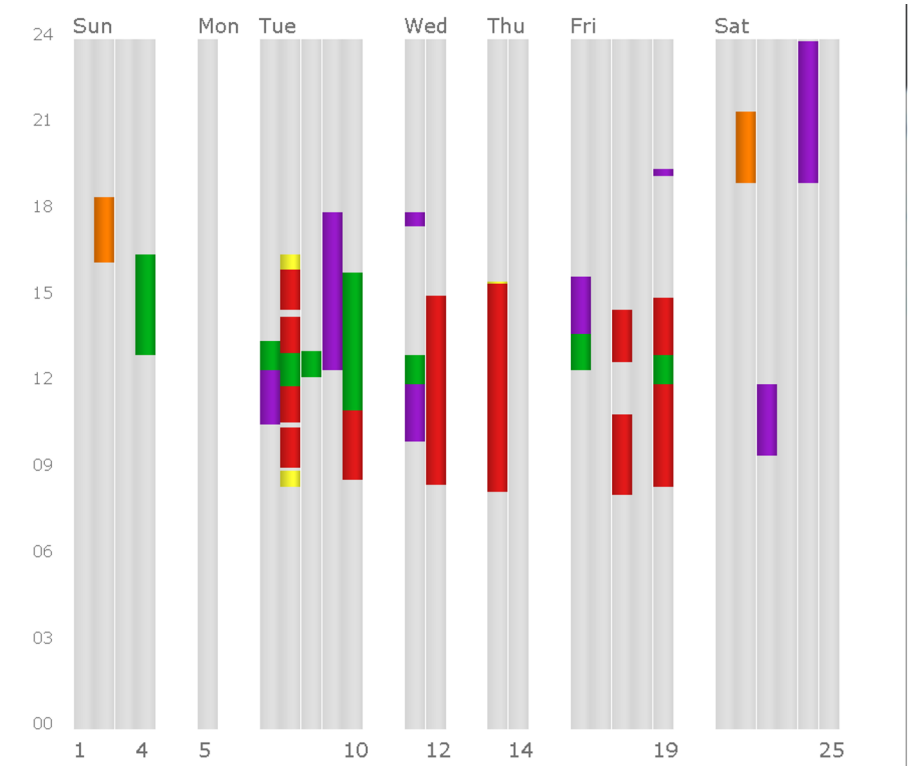
Post-intervention, youth engaged in:

- ✓ more **study related** activities
- ✓ less in **digital media** activities
- ✓ more activities with **friends**

Activities with friends – Aday results

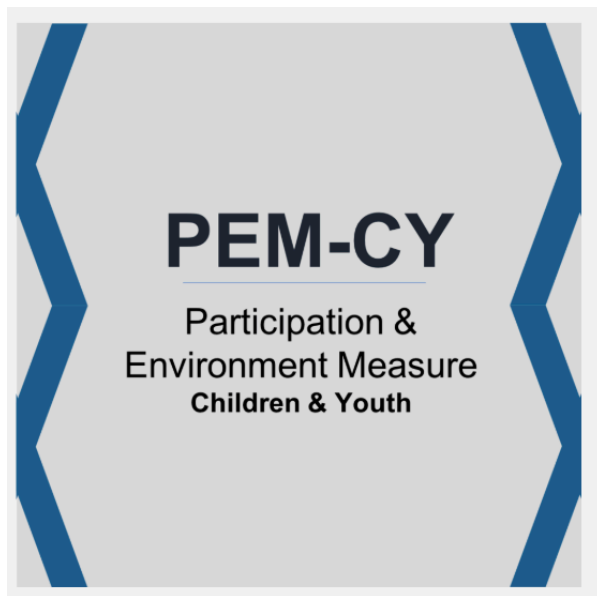


Pre-intervention



Post-intervention

PREP has a ripple effect



- Post-intervention, youth engaged:
- ✓ more often and in greater range of **community** activities
 - ✓ less often in **home** activities
 - ✓ more in special roles at **school**
 - ✓ more parents perceived environmental supports in the **community** (e.g., information, program and services)

What do parents think about the PREP?

A qualitative study of parents (n=12) illustrated the impact of the PREP:

- Multi-faceted effects of care - improvements at the physical, emotional and social levels as well as in autonomy
- Process of Care – acknowledging parental needs in terms of getting information, selecting activities and being reassured.

Anaby et al., 2017

What are the additional benefits resulting from the PREP interventions?



Anaby et al., 2020

The impact of participation on body functions

- Motor
- Cognitive
- Affective



The screenshot shows a webpage header with the CanChild logo (a stylized figure) and the text "CanChild". Below the header is a breadcrumb navigation trail: "CanChild Home Page > Research In Practice > Current Studies > The effectiveness of community participation on body functions". The main content area features the title "The effectiveness of community participation on body functions" in a large, dark font. Below the title is a subtitle: "Can participation in community activities improve motor and mental functions of youth with physical disabilities? Uncovering the various benefits of participation".

Study's objective

To examine the effectiveness of youth engagement in a self-chosen **8-week community-based activity** (e.g., swimming, playing piano) on 3 relevant body functions:

- Motor
- Cognitive
- Affective

as well as on the participation of the selected activity.

Intervention and procedure



Using elements of the PREP approach,

- Each youth chose one activity
- Each activity was analyzed using the “Activity Analysis” approach
- Relevant body functions were identified and matched with appropriate assessments

Assessment kit

Motor body-functions

- Muscle strength (Jamar/MicroFET2)
- Reaching (Functional Reach Test)
- Trunk control (Trunk Impairment Scale)
- ROM (Goniometry)

Cognitive and affective body-functions

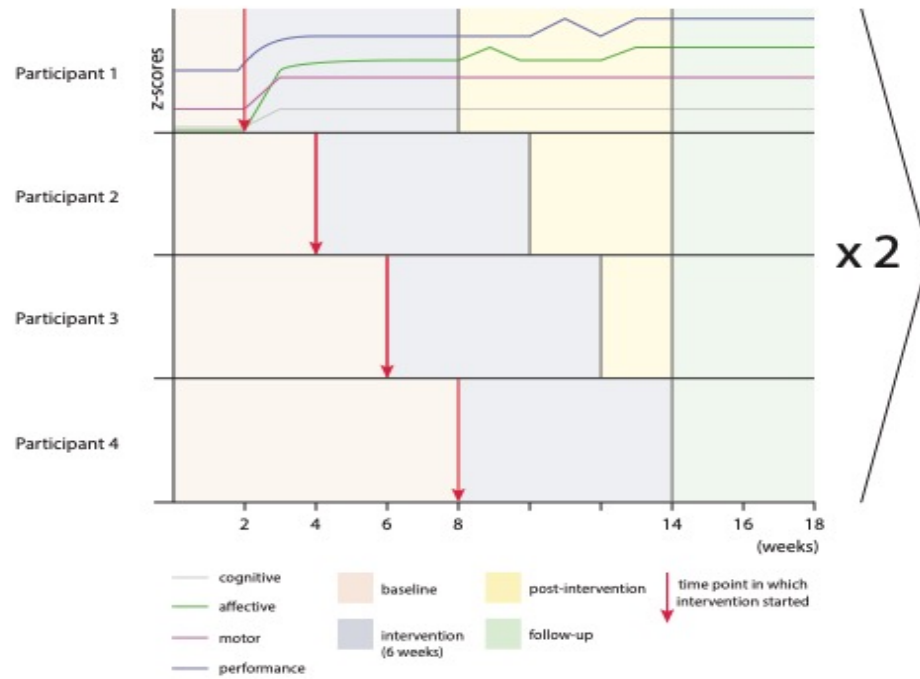
- **Behavior Assessment System for Children (BASC-3)** which measures attention, anxiety etc.

Methods

- A 22-week interrupted time series design with multiple baselines across youth was employed
- Changes in **cognitive** and **affective** functions were measured weekly (22 data-points)
- Changes in **motor**-related functions were measured bi-weekly (11 data-points)
- Linear and mixed-effect models were used

Study design

Figure 1 - Study Design



Participants

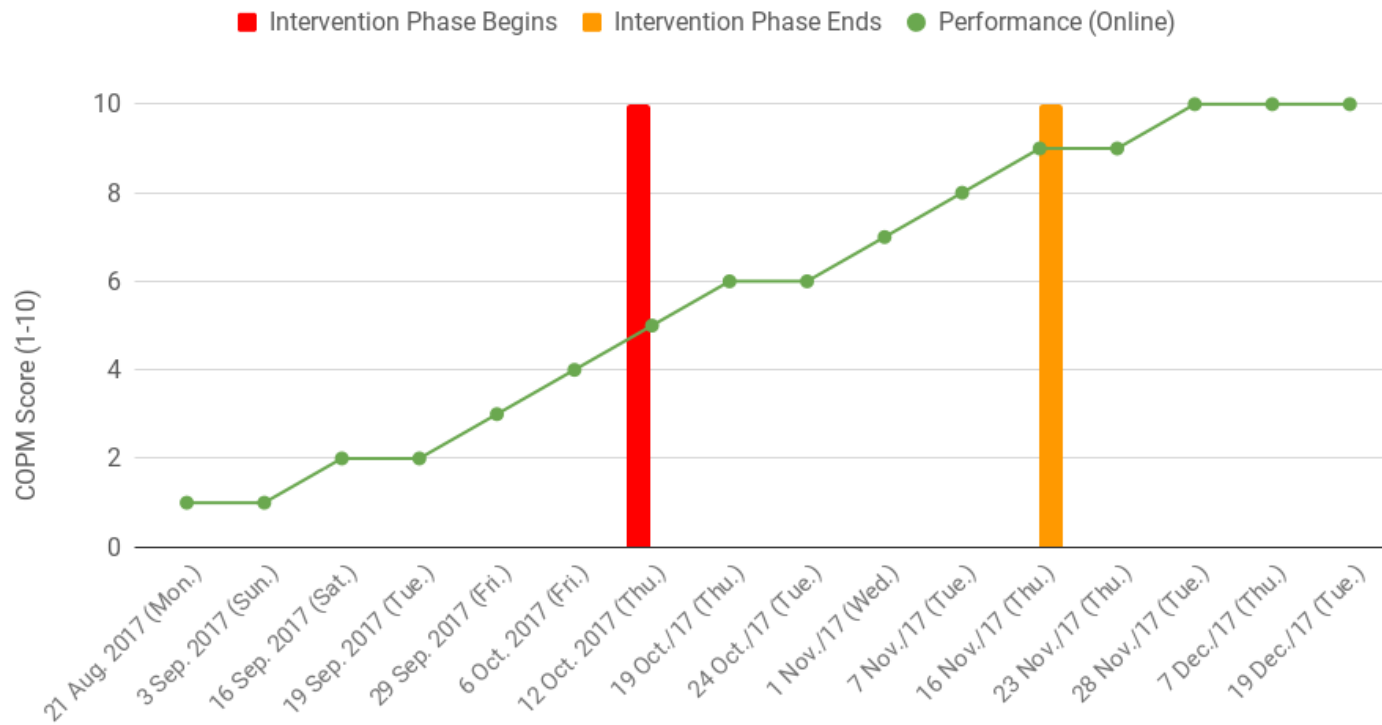
- Youth with physical disabilities (n=7) aged 15-25 (median=18)
- 4 females, 3 males
- Number of health issues ranged from 1 to 5 (mean=1.98)
- Number of functional issues ranged from 1 to 8 (mean=3.7)
- Five youth were living with parents and two with siblings
- Six youth were studying and one was working part-time

PREP can improve outcomes at the body-function level

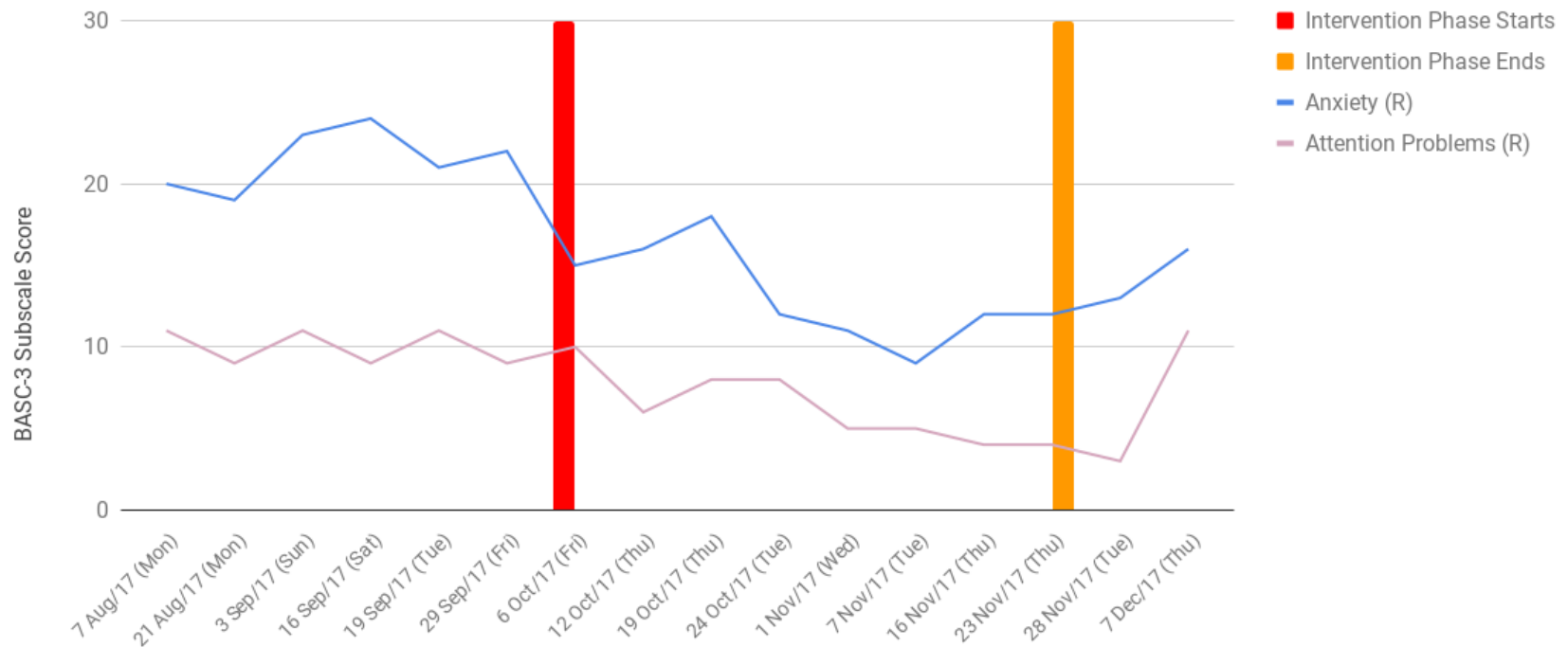
Playing the Guitar

- 20 years old male
- **Health issues:** intellectual disability, speech/language impairment, movement impairment, ABI
- **Functional issues:** Communicating with others; paying attention, learning new things, reacting to sensations, moving, using hands, managing emotions, controlling behaviour

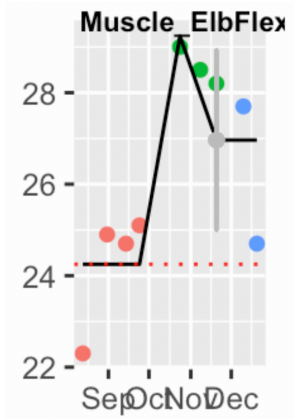
SPOR BFS_03 (guitar): COPM



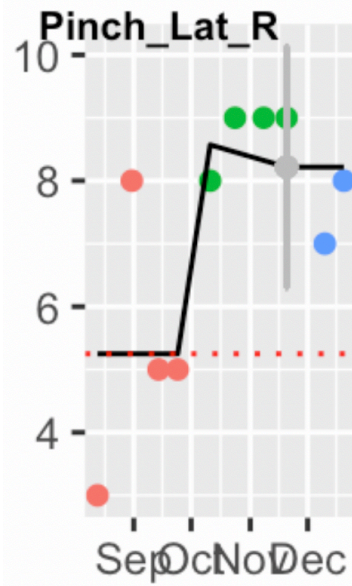
SPOR BFS_03 (guitar) - BASC-3 Subscales (Raw Scores)



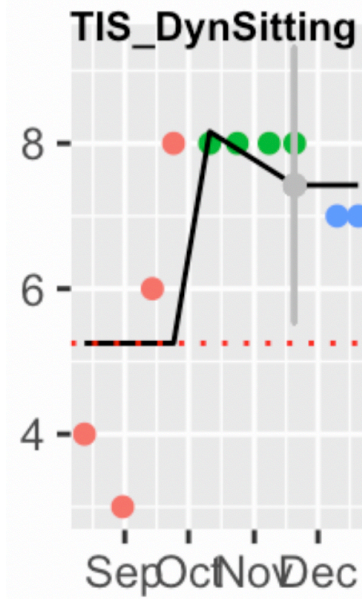
Muscle strength



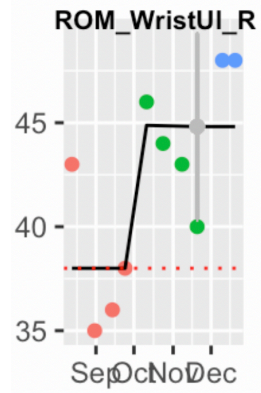
Pinch



Trunk Control



ROM



Participant Activity Chosen	Body Function Outcomes			Performance Outcome
	Motor	Affective	Cognitive	
BFS_01 Programming	NA	Anxiety✓✓ Somatization --	Attention✓✓ Hyperactivity✓✓	✓✓
BFS_03 Guitar	Pinch ✓✓ Trunk Control ✓✓ Strength ✓✓ ROM ✓✓	Anxiety✓✓ Inadequacy --	Attention ✓✓	✓✓
BFS_04 Swimming	Strength ✓✓ Trunk Control ✓✓ Reaching ✓✓ ROM✓✓	Anxiety✓✓ Social stress --	Hyperactivity✓✓	✓✓
S3 Piano	Grip ✓✓ Strength (thumb abd) ✓✓ Strength (wrist ext) ✓✓	Self-Esteem ✓✓ Inadequacy✓	NA	✓✓

✓✓ Significant Improvement; -- Stable

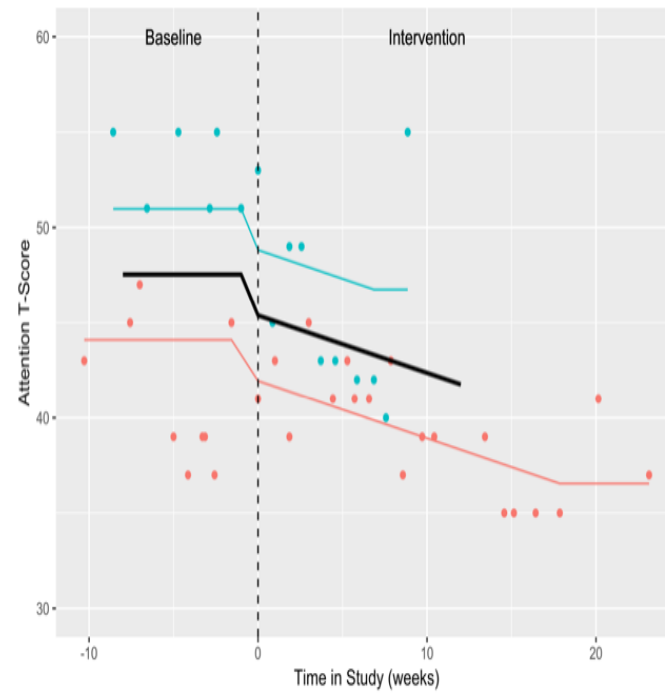
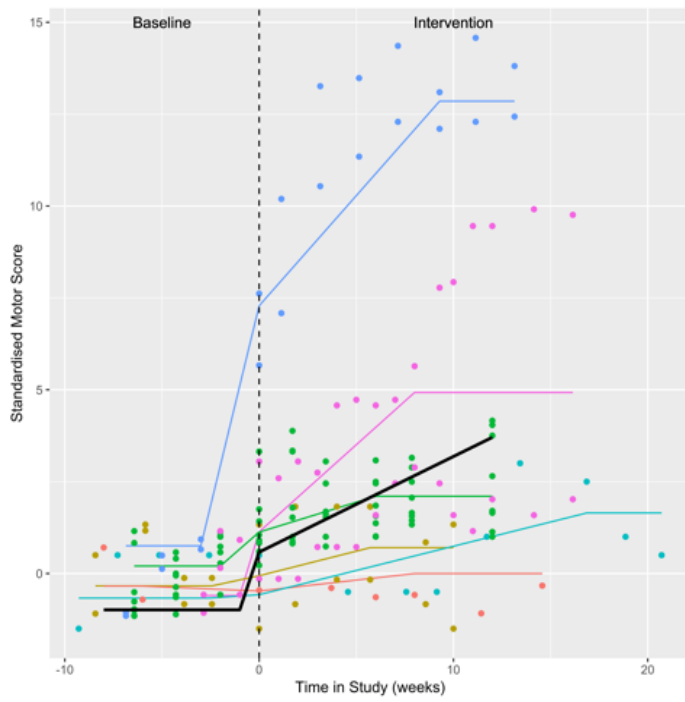
Participant Activity Chosen	Body Function Outcomes			Performance Outcome
	Motor	Affective	Cognitive	
BFS_02 Drawing	Strength (R/L Wrist Ext) ✓	-----	NA	✓✓
BFS_05 Swimming	<ul style="list-style-type: none"> • Forward Reach ✓ • PROM (R/L Hip Flex, L Hip Abd) ✓ • ROM (R Hip Flex) ✓ 	Self-Esteem ✓	NA	✓✓
BFS_06 Walking	<ul style="list-style-type: none"> • Strength (R/L quad, R/L ham, R/L calf) ✓ 	<ul style="list-style-type: none"> • Anxiety ✓ • Sense of Inadequacy ✓ 	NA	✓✓

Impact on body functions – individual trajectories

Significant improvement was observed in the following domains:

- **Motor** (6/6 youth)
 - **Cognitive** (3/3 youth)
 - **Affective** (5/7 youth)
 - Performance (7/7 youth)
- Improvement in 2 out of the 3 functional domains was observed in 6/7 participants

Trajectories of change in body functions



The magnitude of the overall intervention effect - at the outcome level

Outcome	ES
Attention	0.57
Hyperactivity	1.45
Anxiety	0.21
Sense of inadequacy	0.21
Participation	4.61

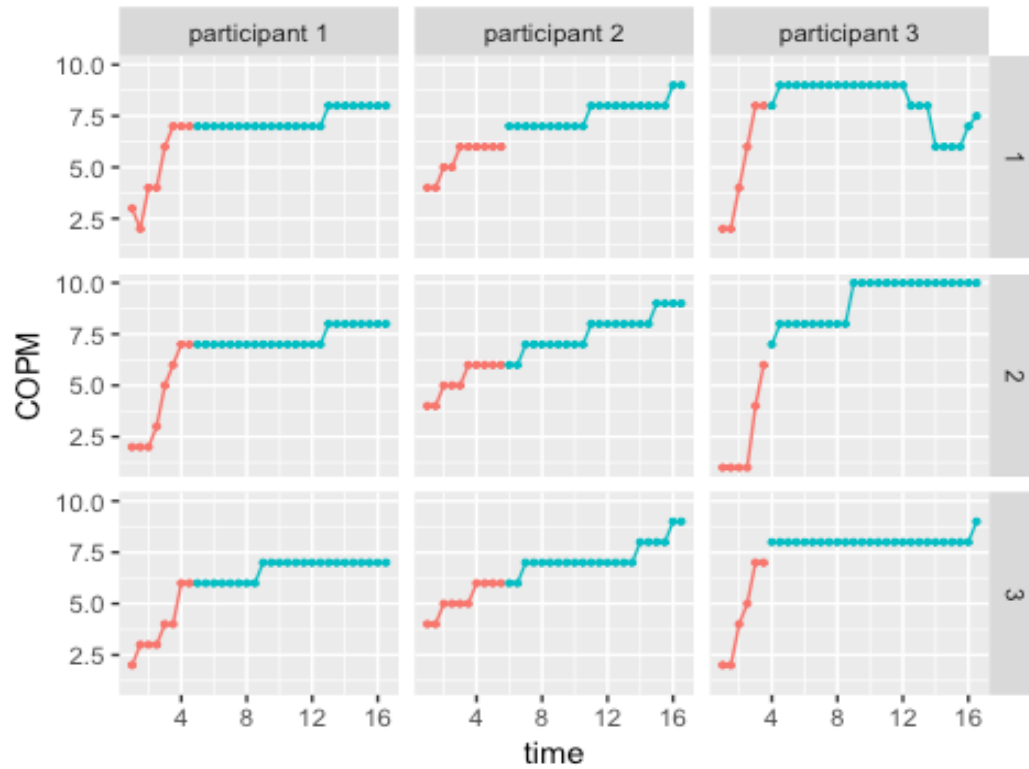
Motor outcomes

A large change of **3.7 SDs** from baseline was observed over the course of the intervention

Use of PREP with children born pre-term in Ireland

- Prior preterm infants (6-7 years of age) without a physical disability
- Goals were home-based or occurred in the immediate community
- Parents were very motivated and started working on goals once they were set, during baseline
- Monitoring COPM biweekly kept parents implicated

Use of PREP with children born pre-term in Ireland



(Killeen & Anaby, submitted)

The PREP was successfully tested among

- Canadian youth with physical disabilities
- Young children with a history of pre-term birth in Ireland
- Children and youth with ABI enrolled in a neuro-rehabilitation center in the UK

Future plans for testing the PREP include:

- The Israeli context
- Children living in India
- Young adults with complex conditions in Australia

Want to learn more on the PREP?

- PREP e-learning module <https://www.canchild.ca/en/shop/25-prep>
- The effectiveness of the Pathways and Resources for Engagement and Participation (PREP) intervention: improving participation of adolescents with physical disabilities [Link here](#)
- Enhancing Youth Participation Using the PREP Intervention: Parents' Perspectives [PDF here](#)
- Focusing on the Environment to Improve Youth Participation: Experiences and Perspectives of Occupational Therapists [PDF here](#)
- Changes in participation of youth with physical disabilities following the PREP intervention: A time-geographic approach [Link here](#)
- Supporting the participation of youth with physical disabilities: Parents' strategies [Link here](#)
- Improved body functions of youth with physical disabilities through participation in community activities [Link here](#)
- Changes in overall participation profile of youth with physical disabilities following the PREP [PDF here](#)
- Contact Dana Anaby at: dana.anaby@mcgill.ca

Take home messages

- The **environment** is key to children's participation and can serve as an effective target of **intervention**
- Environment-based interventions for improving participation, such as the PREP, can result in a range of benefits
- Child-engaging '**real-life**' interventions that are meaningful to the youth seem to be powerful

“The individual is rarely going to be altered very much but the environment slowly but surely can”

(Tom Shakespeare)



Acknowledgment

- Youth and families
- Clinicians
- CIHR
- REPAR
- FRQ-S
- CRIR MAB-Mackay
- CanChild
- Canada Women's Sledge Hockey



Thank you!

dana.anaby@mcgill.ca

<https://www.canchild.ca/en/shop/25-prep-intervention-protocol>



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