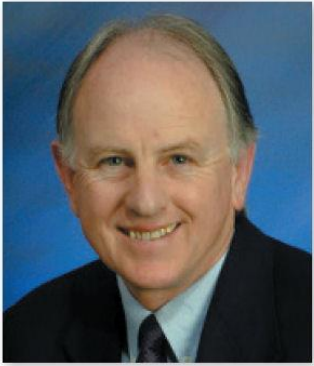




Dr Alex Bartle

Medical Director
Sleep Well Clinic
Christchurch



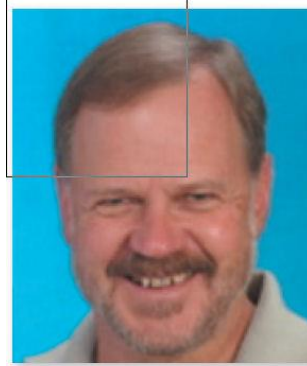
Dr Michael Hlavac

Respiratory and Sleep Physician
Cansleep
Christchurch



Dr Laurie McLay

University of Canterbury
School of Health Science



Professor Richard Jones

Neuroscientist and Neuroengineer
New Zealand Brain Research Institute
Christchurch

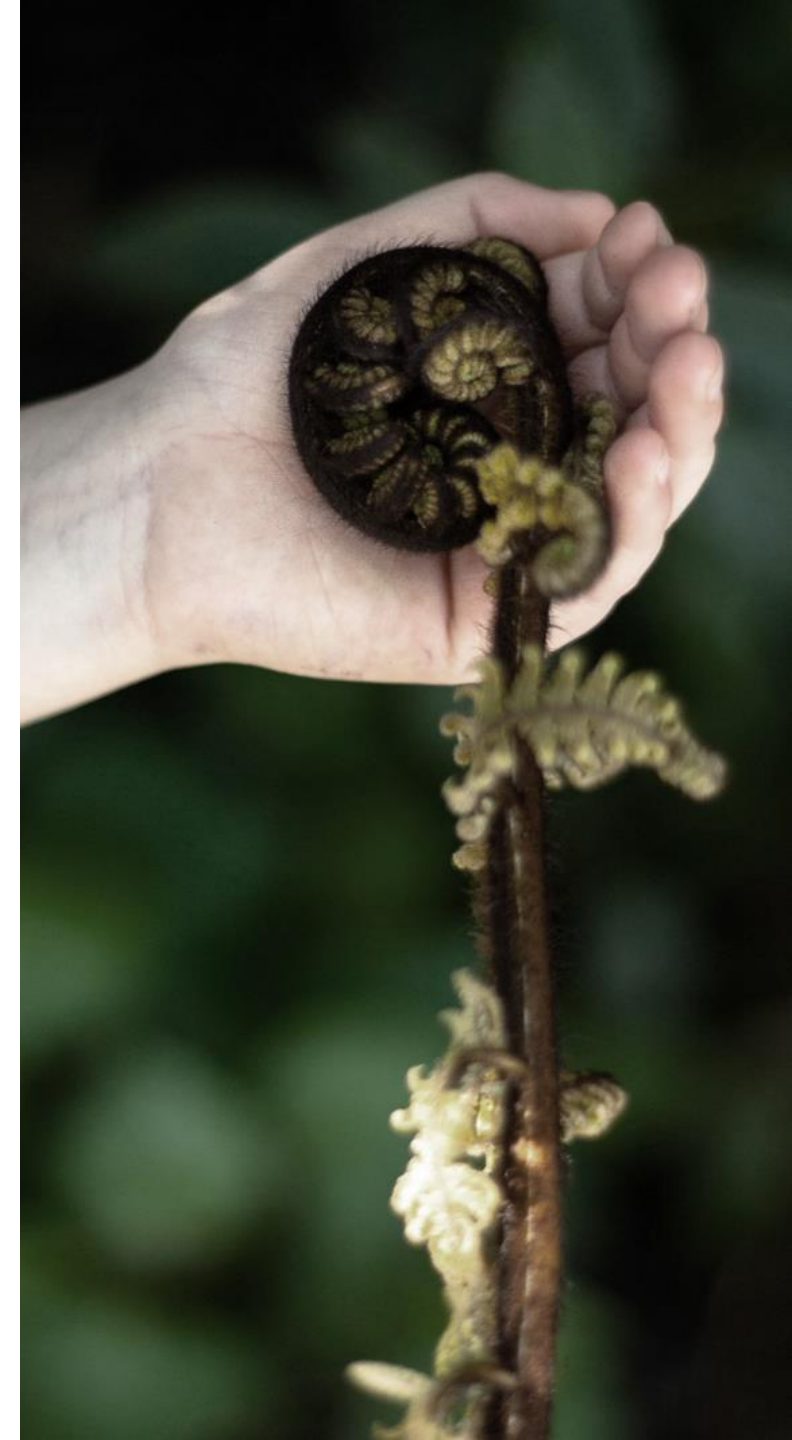
Saturday, August 10, 2019

(Room 5)

14:00 - 16:00 WS #105: Sleep 101 Forum (120mins, not repeated)

A Behavioural Model for Assessing and Treating Sleep Problems in Children with Autism

Ass/Prof. Laurie McLay
University of Canterbury
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Prevalent Persistent Complex



Biopsychosocial Etiologies

- Biological – e.g., melatonin production and synthesis
- Psychological – e.g., cognitions and feelings relating to sleep
- Social – e.g., bedroom environment and routines

Commonly, also a **behavioural** basis to the sleep problem.

Behavioural Variables that Impact Sleep

- Stimulus Associations (consistent stimulus conditions)
- Sleep as part of a behaviour chain
- Reinforcement for sleep competing behaviours
- Establishing Operations – impact on reinforcing value of sleep

Sleep problems often exacerbated by unique features of ASD

Treatable behaviourally or pharmacologically



Canterbury Sleep Study

- Demonstrate the process of using FBA to develop individualised, comprehensive, less restrictive, parent-implemented interventions for children with developmental disorders
- Assess the maintenance of treatment effects over time
- Measure effect of resolution of sleep problems on daytime functioning and parent well-being
- Enhance our understanding of parents experiences with the treatment process

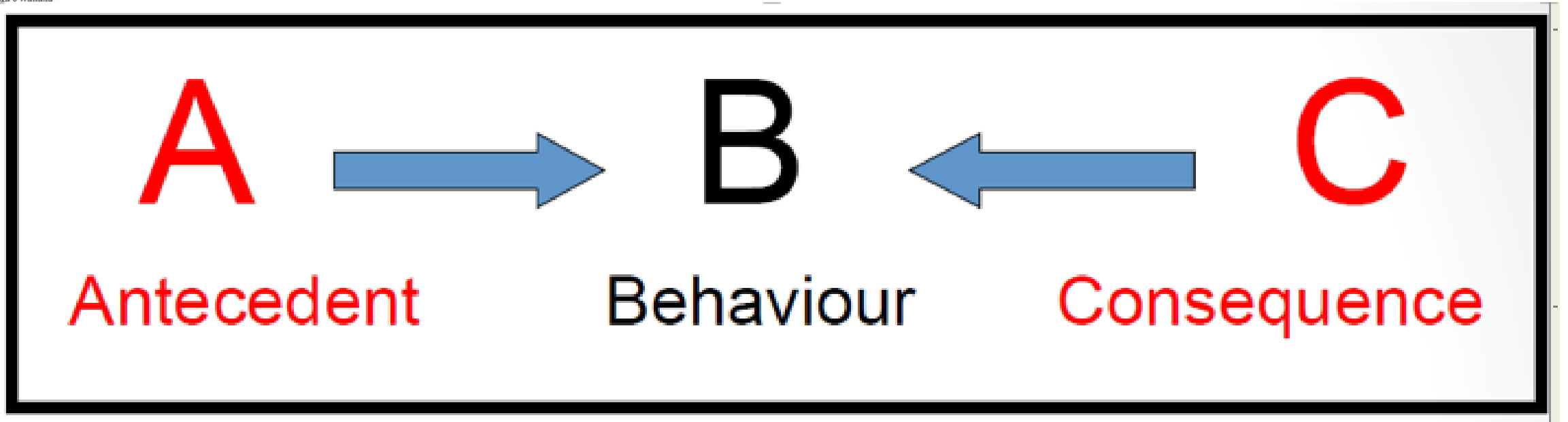


Research Method

- Participants between 2-18 years of age, with ASD, residing throughout NZ
- Parent-implemented

Procedures

- Clinical interview and FBA (SATT; Hanley, 2005)
- Baseline
- Intervention
- Short- and long-term follow-up



We can change what happens at **A** and **C**, in order to affect **B**

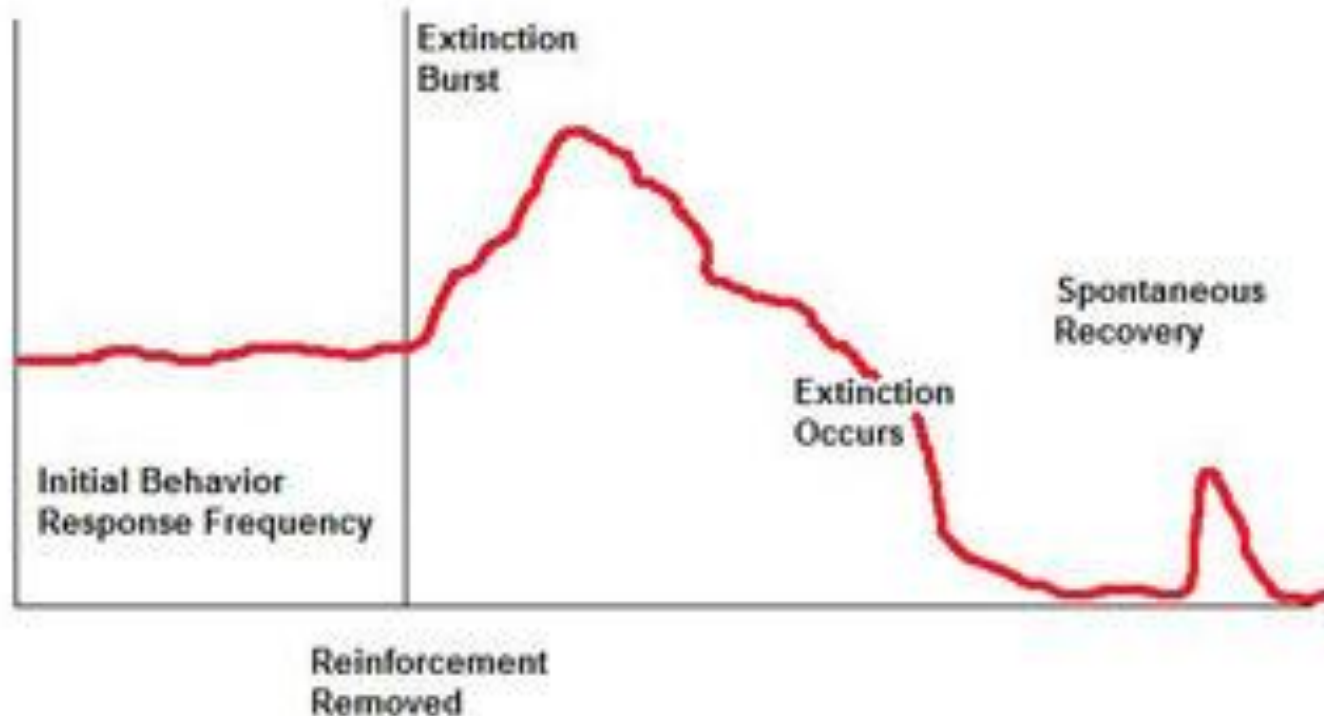
Through the lens of a contingency

Sleep problems can be addressed by
understanding the controlling variables
and teaching the relevant skills



Least-restrictive Alternatives

Extinction Graph



Sleep outcome measures

- Daily, parent-reported sleep diaries
- Videosomnography +/- or actigraphy
- Children's Sleep Habits Questionnaire (CSHQ; Owens et al., 2000a)
- Adolescent Sleep Wake Scale (ASWS; LeBourgeois et al., 2005)
- Sleep Self-report (SSR; Owens et al., 2000b)
- Sleep Problem Severity score

Secondary outcome measures

Child Measures

- Child Behavior Checklist (CBCL; Achenbach, 1991)
- Gilliam Autism Rating Scale (GARS; Gilliam, 2014)
- Strengths & Difficulties Questionnaire (SDQ; XXX)
- Vineland Adaptive Behavior Scales (Sparrow, Cicchetti, & Saulnier, 2016)

Parent Measures

- Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989)
- Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995)
- Relationship Quality Index (RQI; Norton, 1983)

Participant characteristics

- $N = 41$ (31 M, 10 F);
- Age range 3 -15 yrs, $M = 7$ yrs, 2 mths
- Clinical diagnosis of ASD; GARS scores of two or three
- VABS
 - Expressive: 8 mths – 12 yrs; $M = 3:6$ mths
 - Receptive: 11 mths – 22 yrs; $M = 2:8$ mths

Sleep problem/s

- Sleep onset and maintenance + co-sleeping
- Common functions were social attention and tangible
- A number of environmental and biological contributors

Sleep Problem Severity (SPS) Scale

- Three versions
 - Pre-school aged – 2-4 yrs 11 months
 - School aged – 5-12 yrs 11 months
 - Adolescents – 13 yrs+
- Average score across final seven nights of baseline, intervention, short- and long-term follow-up

Common treatment components

- Faded parental presence
- Removal of sleep competing items
- Positive reinforcement
- Visual supports
- Modification to bedtime routine
- Faded bedtime
- Circadian rhythm manipulations
- Stimulus substitutions

Child-led Treatments



XXX's Sleep Checklist

Tonight I felt (circle one):



Very Worried



A little Worried



Not Worried



Happy

I have . . .

Tick to Check



Read a book

Put book in finished box

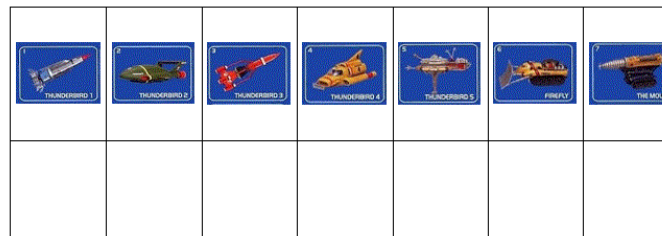
Water by bed

Taken deep breaths

Relaxed my body

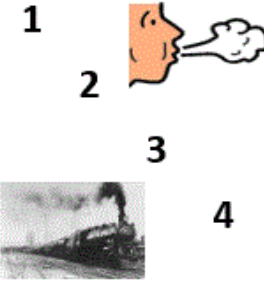


"Hi XXX, get a sticker under each Thunderbird picture to get a reward?"



My Reward:

Breathe out like a
steam train



Point your toes and
stretch your legs as
long as Thunderbird 2



1 2 3 4 5

Relax and blast off
like Thunderbird 1



Stretch your arms out
toward your feet



1 2 3 4 5

Understanding Brinley plots

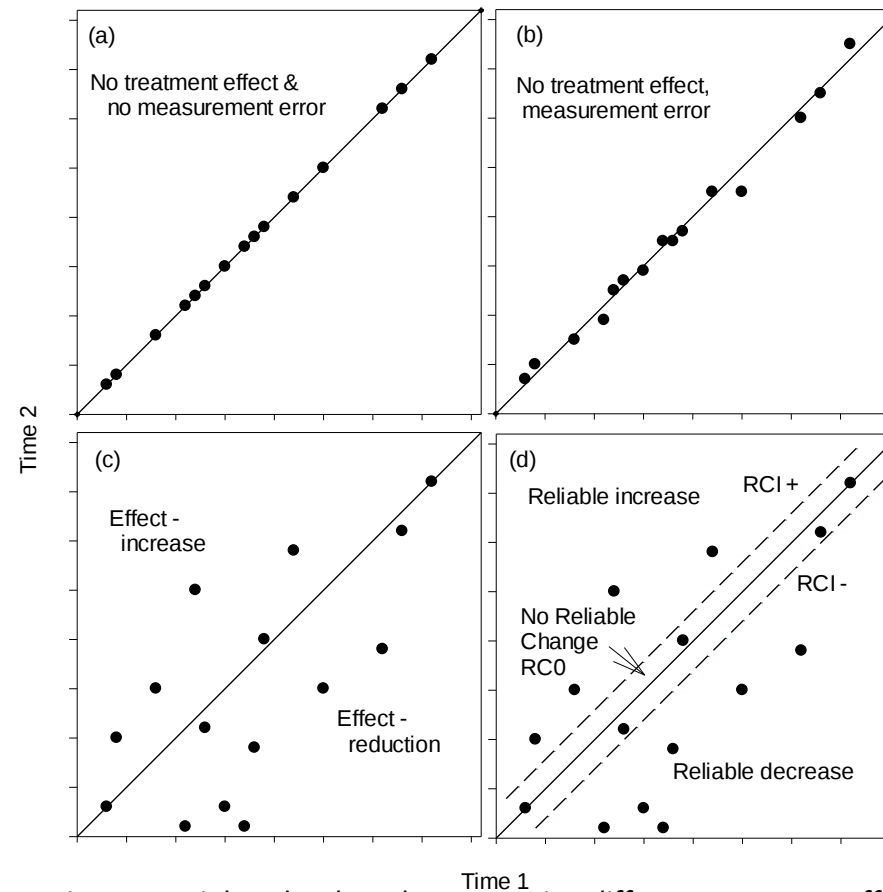


Figure 1. Brinley plot data demonstrating different treatment effects

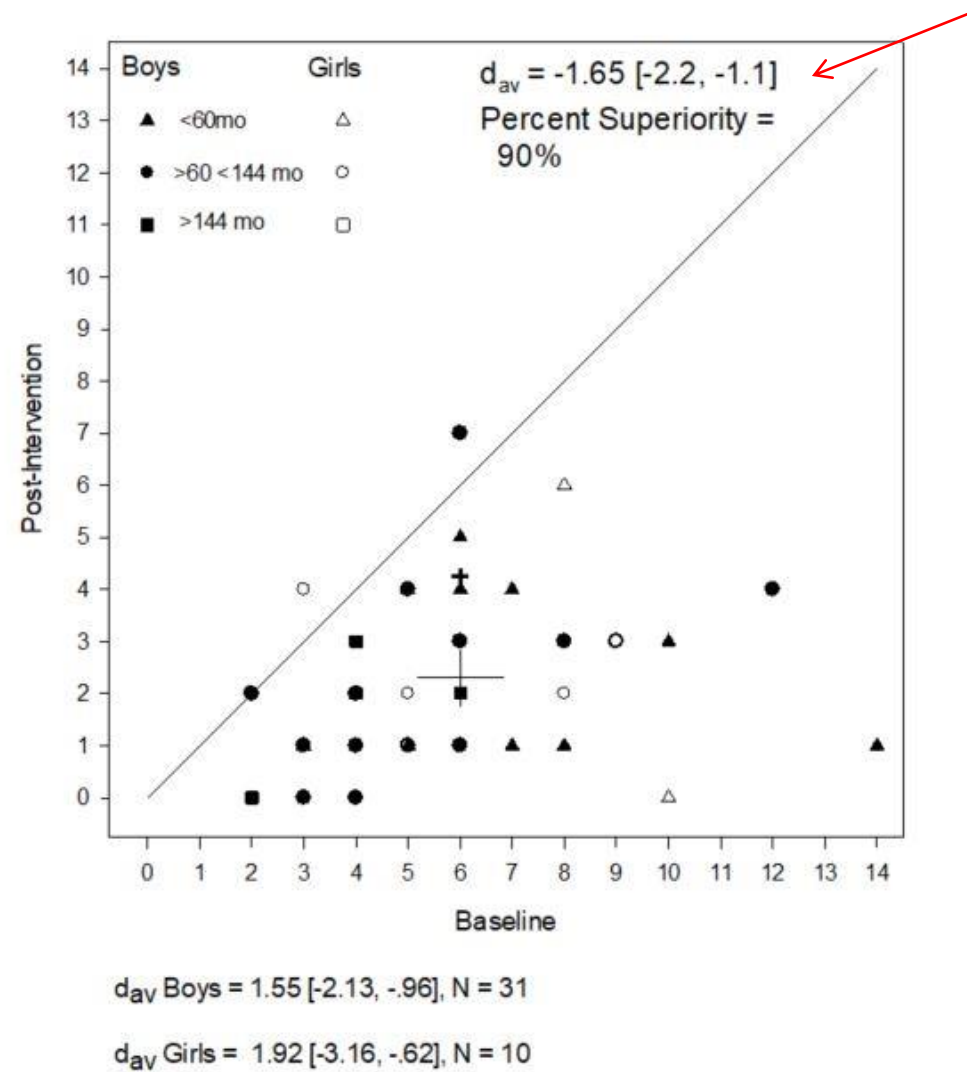


Figure 2. Change in Sleep Problem Severity Scores post-treatment in relation to children's sex and age

SBS Scores Overall Outcome

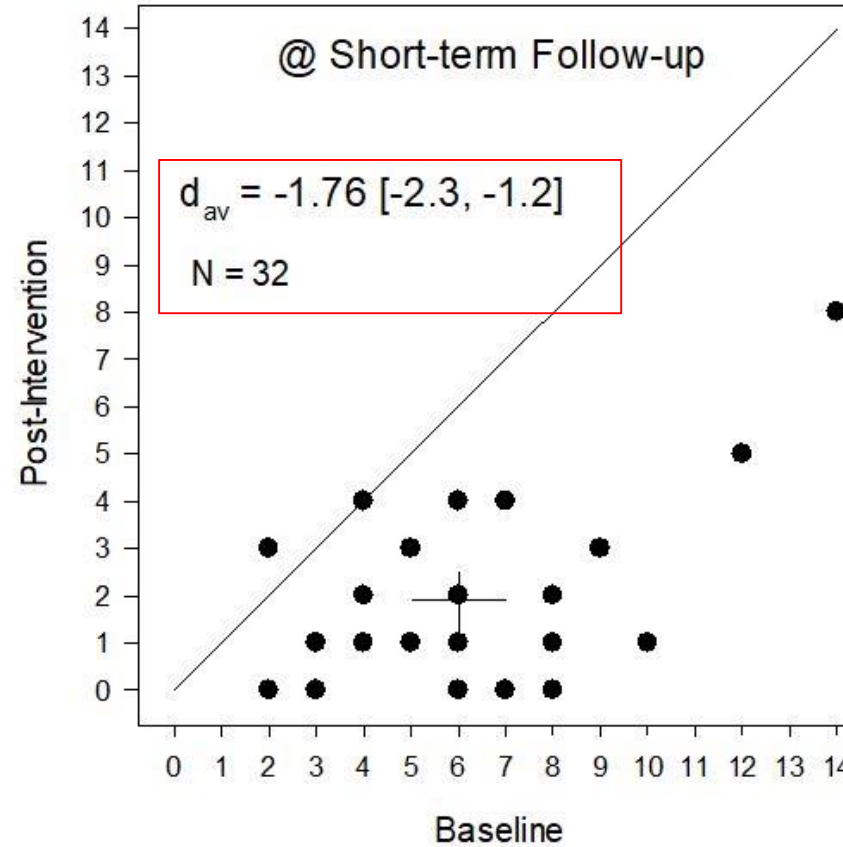


Figure 3. Change in Sleep Problem Severity Scores at short-term follow-up

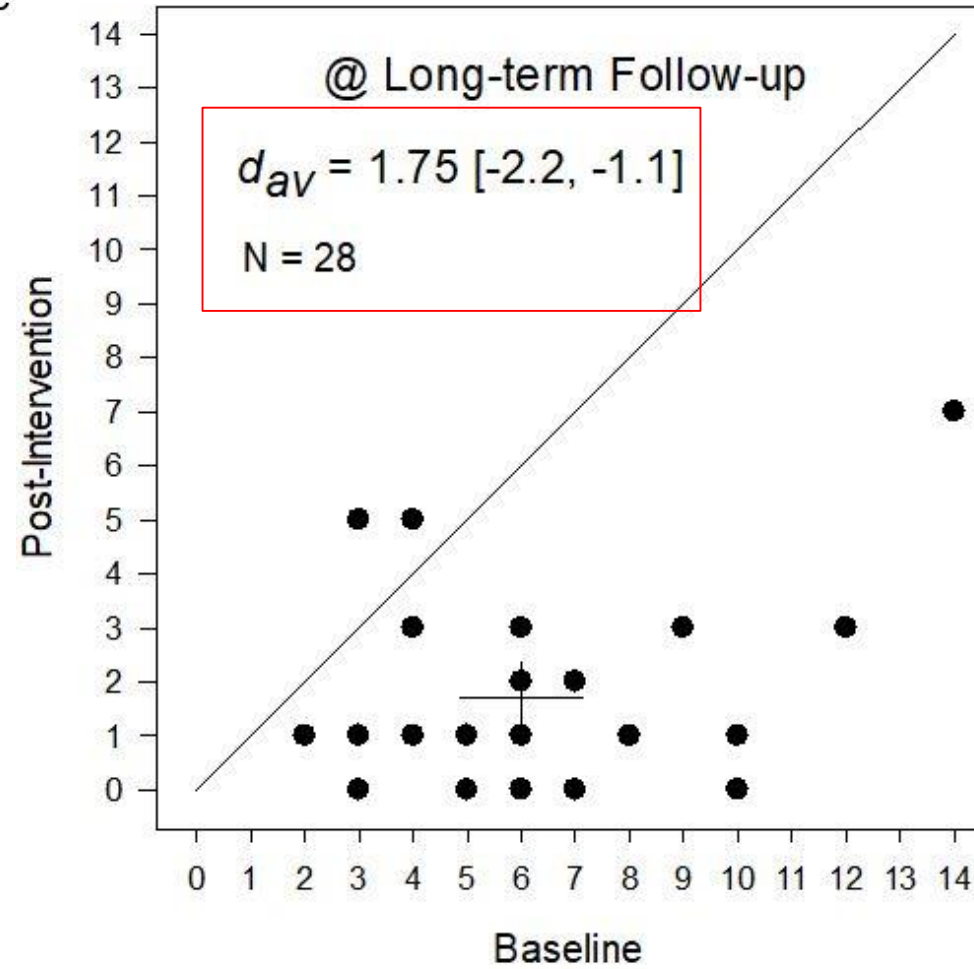


Figure 3. Change in Sleep Problem Severity Scores at long-term follow-up

Overall results

- Treatment resulted in a reduction in SPS scores for majority of children
- Gains maintained at short- and long-term follow-up
- Greater expressive language and externalizing behaviour problem scores linked to higher SPS scores. This did not impair treatment response
- Improvement in sleep resulted in collateral improvement on a number of child and parent measures

Collateral Benefit of Improving Sleep

- Sleep treatment resulted in a small reduction in:
 - Externalizing behaviour problems
 - Internalizing behaviour problems
 - Total problem behaviour (e.g., emotional reactivity, somatic complaints, attention problems, aggression)
 - ASD severity scores

- Improving children's sleep (CSHQ) resulted in a improvement in:
 - Parental sleep quality
 - Depression, anxiety and stress ratings
 - Relationship quality (inconsistent)

Future Research Directions

- Further analysis of existing data
- Explore the relationship between sleep and children's quality of life ratings
- Examine the directionality of the relationship between sleep problems and other behaviours
- Explore the effectiveness and effects of treatment for children and adolescents with rare genetic neurodevelopmental disabilities
- Investigate the effectiveness of telehealth procedures



***Ninety-nine million, nine million and two creatures are sleeping!
So How about you?***