

Neurosequential Model Core Slides

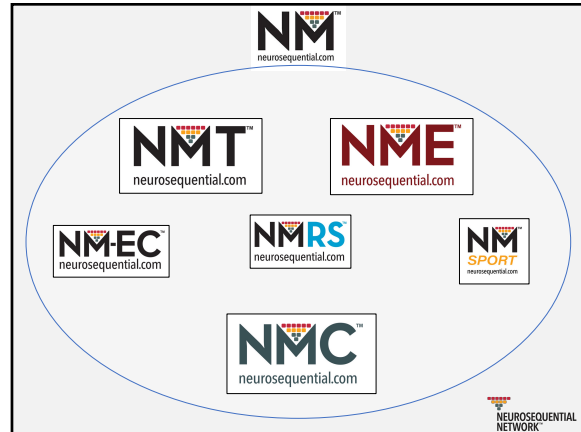
Selected Outcomes

"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete."

- Buckminster Fuller



1



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WHAT IS NMT?

The Neurosequential Model of Therapeutics is a neuroscience-informed, developmentally-sensitive, approach to the clinical problem solving process.

It is not a therapy – and does not specifically imply, endorse or require – any single therapeutic technique or method.



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The NMT is both an 'evidence-based' and an 'evidence-generating' practice.

The web-based, standardized assessment elements allow the collection of aggregate data to facilitate the ongoing monitoring of a range of individual and program outcomes.

The model is designed to allow iterative modifications to improve program and treatment plan elements.



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NM is not "On the Shelf"

86% of clinical research is never used in direct patient care

(Balas & Boren, 2000)

It takes ~17 years for the 14% of research that does influence practice to get there!

(Morris, Wooding & Grant, 2011)

NMT was first manualized in 2008 (NMT Certification: 3 levels)

NME was first manualized in 2012 (NME Certification: 3 levels)

NMC was manualized in 2020 (NMC Trainer Certification)

NM Sport was manualized in 2021 (NM Sport Phase I Certification)

Since 2008

90,000 NMT metric reports

100,000 NME "mini-map" reports

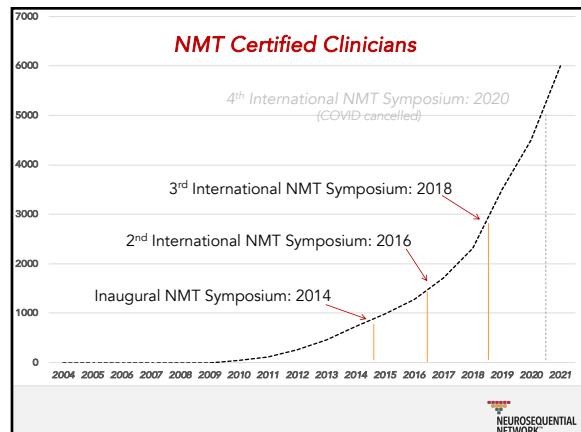
5000 + NM (NMT, NME, NMC & NM Sport) certified professionals

600 + NMT or NME certified organizations

28 countries



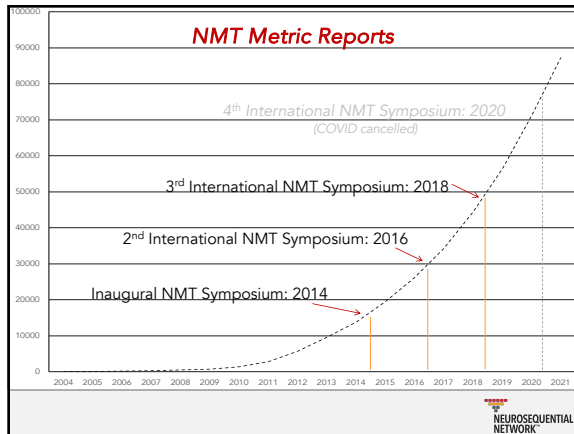
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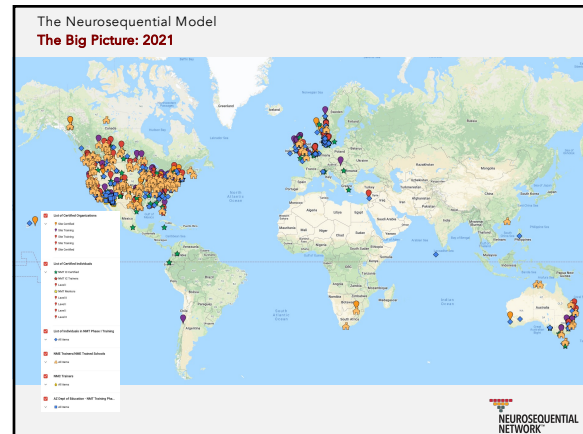
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Neurosequential Model Core Slides

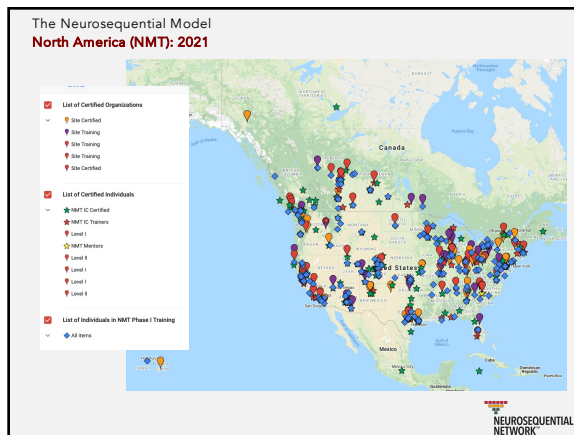
Selected Outcomes



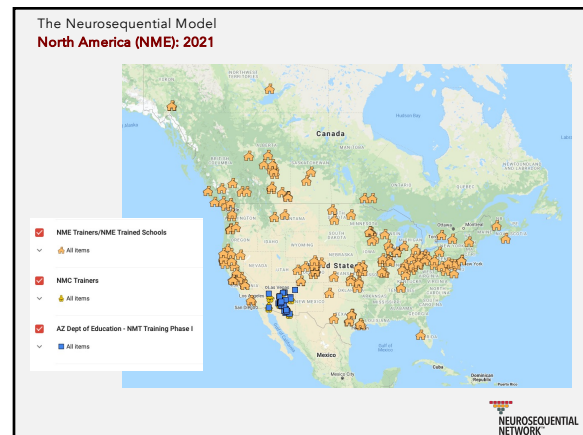
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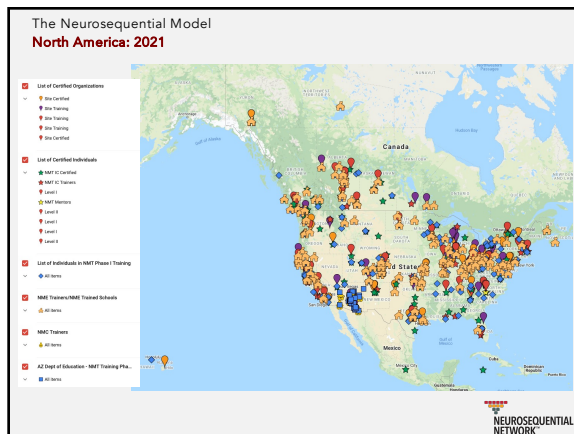
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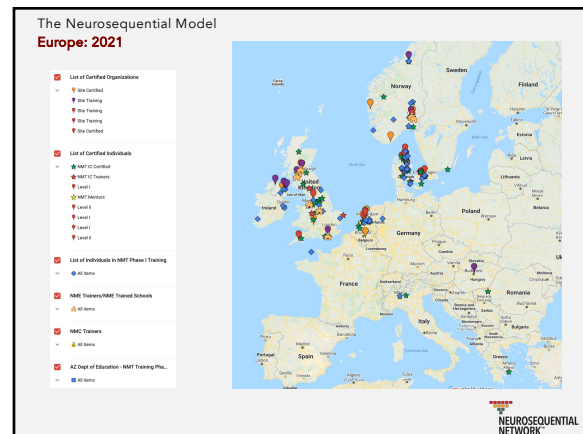
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Neurosequential Model Core Slides

Selected Outcomes



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Cumulative
Clinicians, Teachers,
Caregivers
Exposed to the
Neurosequential
Model

YEAR	Web, Webinars, Books, Live Training
2004	6,000
2005	20,000
2006	40,000
2007	80,000
2008	120,000
2009	180,000
2010	250,000
2011	300,000
2012	350,000
2013	400,000
2014	500,000
2015	600,000
2016	800,000
2017	900,000
2018	1,000,000
2019	1,300,000
2020	1,800,000
2021	2,500,000

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YEAR	NMT, NMT NMAC, NMT Spent	Professionals Using NMT (Direct) Cumulative	Children, Youth, Adults (Indirect) Cumulative	Professionals Using NMT (Indirect) Cumulative	Children, Youth, Adults (Indirect) Cumulative
2004	1	25	10	250	
2005	4	100	40	1000	
2006	10	250	100	2500	
2007	12	300	120	3000	
2008	20	500	200	5000	
2009	45	1125	450	11250	
2010	44	1100	440	11000	
2011	120	3000	1200	30000	
2012	264	6600	2640	66000	
2013	462	11550	4620	115500	
2014	726	18150	7260	181500	
2015	992	24800	9920	248000	
2016	1278	31950	12780	319500	
2017	1708	42700	17080	427000	
2018	2618	65450	26180	654500	
2019	3418	85450	34180	854500	
2020	4200	105000	42000	1050000	
2021	5124	128100	51240	1281000	
2022*	6000	150000	60000	1500000	
		Direct	676,150	Indirect	2,930,500
			TOTAL		3,606,650

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NMT™
neurosequential.com

The Neurosequential Model

Selected outcomes

NMT-related

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Youthville: TRC in first year of NMT Certification

- According to Youthville encounter data, between April 23, 2009 and January 26, 2010, the TRC served 28 children. Children and families received between 1 and 257 days of service, with an average of 111 days of service and a median of 118 days of service.
- Findings suggest increased placement stability for children receiving TRC services. Pre-TRC, children in the treatment group had an annualized placement change rate of 2.41. Since TRC treatment, that rate has declined to 1.13.
- Among children in TRC, the rate of psychiatric, detention, or other institutional placement declined 33.3%. This compares to a 50% increase in the usual care group.
- Of children in TRC treatment, 42.9% now have a case plan goal of adoption, compared to 30.1% of the usual care group. This suggests that the TRC group was well-selected to achieve permanency and appears to be moving toward that goal.

From: Bryson, S., Akin, B., Moore, T. & O'Brien, M. (2010) *Youthville Trauma Recovery Center Evaluation, Year One* pp 1-44, Report to Office of Child Welfare and Children's Mental Health, University of Kansas School of Social Welfare.

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Neurosequential Model of Therapeutics in a Therapeutic Preschool: Implications for Work With Children With Complex Neuropsychiatric Problems

Sharon Barfield
Health Policy and Research Solutions, Lawrence, KS

Christine Dobson
The ChildTrauma Academy, Houston, TX

Rick Gaskill
Summer Mental Health and Wichita State University

Bruce D. Perry
The ChildTrauma Academy, Houston, TX and Feinberg School of Medicine, Northwestern University

The two studies presented examine the use of the Neurosequential Model of Therapeutics on the social-emotional development and behavior of 28 children participating in a therapeutic preschool program. Results from these studies indicate that the use of the Neurosequential Model of Therapeutics approach to determine the nature, timing, and "dose" of developmentally appropriate activities and interventions within the context of a therapeutic preschool did improve the social-emotional development of the participating children. Interventions and activities were provided in the context of Filial Play Therapy as part of the therapeutic preschool environment. Six-month and 12-month follow-ups suggest gains in social-emotional development and behavior were retained. Implications for future use are discussed.

CITATION
Barfield, S., Dobson, C., Gaskill, R., & Perry, B. D. (2011, October 31). Neurosequential Model of Therapeutics in a Therapeutic Preschool: Implications for Work With Children With Complex Neuropsychiatric Problems. *International Journal of Play Therapy*. Advance online publication. doi: 10.1037/a0025955

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NMT in Pre-school Setting (Study 1)

NMT in a Therapeutic Preschool

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Table 1. Difference in Pretest and Posttest PSEDRI Scores and Time Series PSEDRI Scores (Social-Emotional Development) for Study 1

PSEDRI scores	Pretest mean (SD)	Posttest mean (SD)	t	p	d (effect size)
PSEDRI composite (n = 13)	1.79 (.508)	2.98 (.848)	6.16	<.001**	2.34
Emotion regulation	1.88 (.449)	2.86 (.810)	5.4	<.001**	2.18
Helpfulness	2.04 (.824)	3.31 (1.22)	4.4	<.001**	1.54
Fair assertiveness	1.92 (.768)	3.87 (.768)	7.5	<.001**	2.54
Impulse modulation	1.73 (.593)	2.64 (1.01)	3.8	<.001**	1.31
Cooperation	1.94 (.584)	3.21 (1.09)	5.23	<.001**	2.17
Empathy	.94 (.668)	1.77 (1.14)	3.19	.003**	1.24

	Time series mean (SD)	Week 1 mean (SD)	t	p	d (effect size)
PSEDRI composite (n = 13)	1.82 (.288)	1.85 (.430)	-.346	.73	-.07
Week 2	1.74 (.318)	1.85 (.430)	-1.39	.168	-.26
Week 3	2.72 (.799)	1.85 (.430)	6.25	<.001**	2.02
Week 4	2.77 (.670)	1.85 (.430)	7.33	<.001**	2.14
Week 5	3.05 (.753)	1.85 (.430)	9.2	<.001**	2.79

** p < .01.

From: Barfield, S., Gaskill, R., Dobson, C. & Perry, B.D. (2011) *Neurosequential Model of Therapeutics® in a Therapeutic Preschool: Implications for Work with Children with Complex Neuropsychiatric Problems*. International Journal of Play Therapy Online First Publication, October 31, 2011. Doi:10.1037/a0025955



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Article

Clinical Improvements in adopted children with fetal alcohol spectrum disorders through neurodevelopmentally informed clinical intervention: A pilot study

Zohreh Zarnegar^{1,2}, Erin P Hambrick³, Bruce D Perry^{4,5}, Stanley P Azen⁶ and Cassandra Peterson⁷

¹Los Angeles County Department of Mental Health, USA

²Children's Health International, USA

³School of Medicine, University of Colorado, USA

⁴The ChildTrauma Academy, USA

⁵Northwestern University, USA

⁶University of Southern California, USA

⁷Telecare Corporation, USA

California



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Zarnegar et al.

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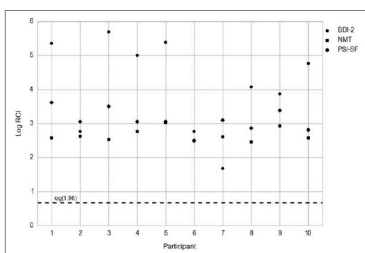


Figure 2. Reliable change of participant scores from pre- to post-intervention. RCI: Reliable Change Index (RCI > 1.96 is considered reliable Jacobson & Truax, 1991); BDI: Battelle Developmental Inventory, Second Edition (BDI-2 Total Score comprises Interpersonal/Social, Adaptive, Motor, Communication, and Cognitive subscales); PSI-SF: Parenting Stress Inventory, Short Form (PSI-SF comprises Difficult Child, Parent Distress, and Parent-Child Interaction subscales); NMT: Neurosequential Model of Therapeutics (NMT Total Score comprises Sensory Integration, Self-Regulation, Relational, and Cognitive subscales).

California



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Table 3. Pre- and post-intervention related-samples Wilcoxon signed-rank tests (N = 10).

Domain	Pre-mean and 95% CI	Post-mean and 95% CI	Standard error	Standardized test statistic	r	p
BDI-2 Total Score	0.205 [0.148, 0.261]	0.518 [0.394, 0.641]	9.80	2.81	.63	.005*
PSI-SF Total Score	23.40 [18.56, 28.24]	45.20 [40.88, 49.52]	9.79	-2.81	-.63	.005*
NMT Cortical Modulation Ratio	0.205 [0.148, 0.261]	0.518 [0.394, 0.641]	9.80	2.81	.63	.005*
NMT Total Score	23.40 [18.56, 28.24]	45.20 [40.88, 49.52]	9.79	2.81	.64	.005*

BDI: Battelle Developmental Inventory, Second Edition (BDI-2 Total Score comprises Interpersonal/Social, Adaptive, Motor, Communication, and Cognitive subscales); PSI-SF: Parenting Stress Inventory, Short Form (PSI-SF comprises Difficult Child, Parent Distress, and Parent-Child Interaction subscales); NMT: Neurosequential Model of Therapeutics (NMT Total Score comprises Sensory Integration, Self-Regulation, Relational, and Cognitive subscales); CI: confidence interval; r: rank-biserial correlation effect size.

California



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JOURNAL OF CHILD CUSTODY
2019, VOL. 16, NO. 3, 291-312
<https://doi.org/10.1080/15379418.2019.1607796>



Trauma-responsive child welfare services: A mixed methods study assessing safety, stability, and permanency

James Topitzes^{a,b}, Timothy Grove^c, Erika E. Meyer^d, Stacey M. Pangratz^{e,f}, and Caitlin M. Sprague^{g,h}

^aSocial Work, Helen Bader School of Social Welfare, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin, USA; ^bInstitute for Child and Family Well-Being, Milwaukee, Wisconsin, USA; ^cSaintA, Milwaukee, Wisconsin, USA

Similarly, the trauma-informed assessments drew mixed reviews from interview participants. Nearly all mentioned that older children seldom completed the TSCC honestly. They were, according to staff, either too embarrassed, mistrusting, burnt out or angry to do so. Consequently, staff complained that results from many TSCC assessments were unreliable and invalid. Conversely, staff mentioned that caregivers who completed the Trauma Symptom Checklist for Young Children produced reliable and valid assessment responses. Results that appeared to reflect actual experiences were, according to staff, valuable. These results could inform service plans and conversations with stakeholders. However, staff consensus was that too much time was spent collecting poor information with the TSCC. NMT assessments however drew praise from most interviewees. Qualified staff completed these assessments for only a small fraction of program cases, and a number of interview participants recommended that more if not all cases receive such assessment services. One case manager said, "NMTs were super helpful because they provided a detailed analysis." Another said, "NMTs should be available to everyone."

Wisconsin



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RESIDENTIAL TREATMENT FOR CHILDREN & YOUTH
2018, VOL. 00, NO. 00, 1-22
<https://doi.org/10.1080/0886571X.2018.1425651>



Restraint and Critical Incident Reduction Following Introduction of the Neurosequential Model of Therapeutics (NMT)

Erin P. Hambrick^{a,b}, Thomas W. Brawner^b, Bruce D. Perry^{b,c}, Emily Wang^d, Gene Griffin^{b,c}, Toni DeMarco^c, Cara Capparelli^f, Tim Grove^g, Michelle Maikoeetter^h, Dawn O'Malleyⁱ, Dave Paxton^j, Lorraine Freedle^j, Jeffrey Friedman^j, Joan Mackenzie^m, Katharine M. Perry^j, Pete Cudney^j, Jerry Hartman^j, Elizabeth Kuh^j, Joseph Morris^j, Caroline Polales^j and Mark Strother

^aUniversity of Missouri Kansas City, Department of Psychology, Kansas City, Missouri, USA; ^bThe ChildTrauma Academy, Houston, Texas, USA; ^cNorthwestern University, Feinberg School of Medicine, Department of Psychiatry, Chicago, Illinois, USA; ^dHull Services, Calgary, Alberta, Canada; ^eSan Mateo County Behavioral Health, San Mateo, California, USA; ^fNortheastern Family Institute, South Burlington, Vermont, USA; ^gSaintA, Milwaukee, Wisconsin, USA; ^hCal Farley Boy's Ranch, Amarillo, Texas, USA; ⁱClinical and Neuropsychological Services, Charlotte, North Carolina, USA; ^jThe Village Network, Wooster, Ohio, USA; ^kPacific Quest, Hilo, Hawaii, USA; ^lWarwick Family Services, Bensalem, Pennsylvania, USA; ^mKibble Education and Care Center, Paisley, Scotland; ⁿAdministration for Children's Services, City of New York, New York, USA

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Table 2. Estimated economic savings associated with restraint reductions

1538027

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	Ten sites
	Three countries (eight states)
	Avg duration of site review = 64 months (range 10-132 months)
2744 clients served in the 10 programs during the duration of the review period	
	Conservative economic benefit from just the reduction in restraints
	\$1,538,027
	4,269 restraints (avoided)
51,228 "person-hours" required for "restraint" re-directed	

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Neurosequential Model Core Slides Selected Outcomes

Is the Neurosequential Model of Therapeutics helpful and feasible for foster carers and their looked after children? Findings from a 6-month pilot study.

Jill Cossar and Helen Runciman

Conclusion
This findings of this brief pilot study indicated that an NMT-informed approach to supporting looked after children and their carers was associated with significant, positive changes in aspects of children's behaviour, well-being and development and also their carers' parenting stress. Future research conducted on a larger scale and over a longer time period would be helpful to provide more detailed information about the impacts and the sustainability of the model over time.

Scotland

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Table 2 Descriptive Statistics of Measures for Intervention Sample

	M pre-	Mean post-	SD pre-	SD post-	Significance	M pre-	SD post-	Significance
SDQemo.sym	2	2.21	0.5	0.67	NS	0.95	0.76	NS
SDQcon.pro	3.64	2.79	0.57	0.68	*	0.80	0.70	NS
SDQhyp	6.21	4.43	0.68	0.78	**	0.87	0.75	NS
SDQpeer	2.5	1.86	0.73	0.68	NS	0.42	0.48	NS
SDQtotal	14.36	11.28	1.96	2.25	***	1.76	1.98	NS
PSIpar.dist	24.71	22.79	1.74	1.88	NS	4.37	2.91	NS
PSIpc-dys	25.93	22.43	1.5	2.03	*	1.96	1.84	NS
PSIdiff.child	32.86	28.43	2.46	2.94	*	2.44	3.08	NS
PSItotal	83.5	73.64	4.49	6.41	*	7.48	6.66	NS
ACC-sFtotal	16.29	13.86	3.35	3.96	NS	4.12	2.71	NS
CBQurg	54.57	55.93	2.97	2.59	NS	5.80	1.98	NS
CBQneg.aff	50.93	54.43	4.15	2.86	NS	2.44	3.18	NS
CBQeff.con	54.14	60.29	2.93	2.43	**	2.12	4.16	NS

M: mean; SD: standard deviation; SDQ: Strengths and Difficulties Questionnaire; emo sym: emotional symptoms; con pro: conduct problems; hyp: hyperactivity; peer: peer problems; PSI: Parenting Stress Index-Short Form; par dist: parental distress; p-dys: parent-child dysfunctional interaction; diff child: difficult child; ACC: Assessment Checklist for Children-Short Form; CBQ: Children's Behaviour Questionnaire-Very Short Form; urg: urgency; neg aff: negative affect; eff con: effortful control; NS: not significant; *p<0.05; **p<0.01; ***p<0.005

Scotland

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B.D. Perry, M.D., Ph.D.
The Neurosequential Model of Therapeutics

Creating Violence Free & Coercion Free Treatment Environments: NMT & CPS

New Horizon Youth Campus

2014-2015 152 restraints 20.6/1000 bed days
2015-2016: 137 restraints 21.3/1000 bed days
2016-2017 109 restraints 13.4 /1000 bed days

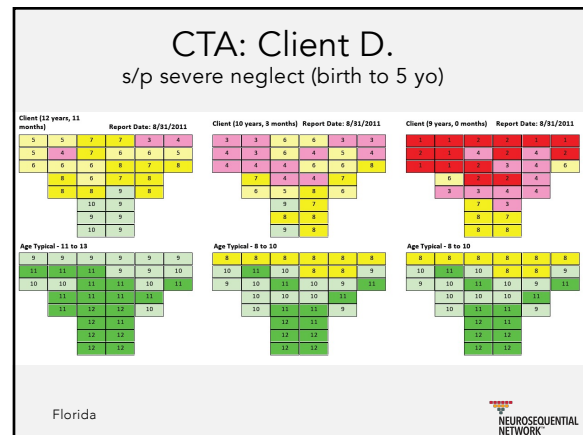
NMT & CPS Training (2017-2018)

2017-2018: 24 restraints 3.6/1000 bed days

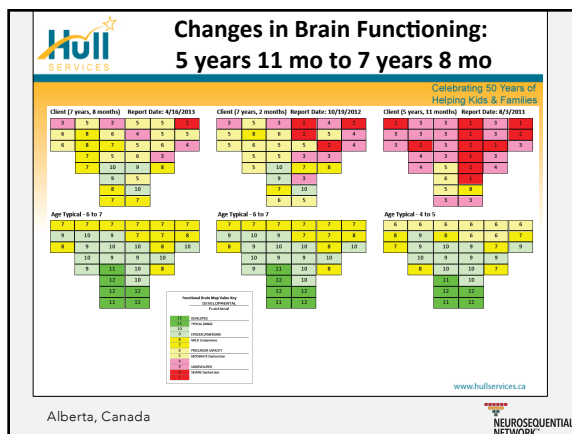
Partnerships For A Brighter Future: Village Network

Ohio

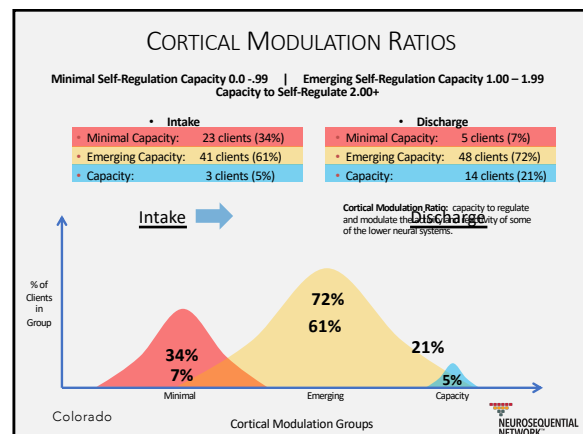
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Allison Cox
Berry Street Take Two Program
Eaglemont, Victoria, Australia

Bruce D. Perry
The Child Trauma Academy
Houston, Texas
Feinberg School of Medicine
Northwestern University

Margarita Frederico
La Trobe University
Ruslandra, Victoria, Australia

This paper demonstrates bringing together clinical services, research and training in a loop of evidence-informed and evidence-generating practice utilizing the Neurosequential Model of Therapeutics (NMT) to improve assessment and intervention for children impacted by abuse and neglect. Take Two client data ($n = 677$)

between 2010 and 2017 were analyzed. Repeat measure analysis found children demonstrated statistically significant improvement, benefiting from a relational model of intervention prioritizing building a system of therapeutic relationships to promote resilience and positive sense of self.

Cox, A., Perry, B.D., & Frederico, M. (2021). *Resourcing the system and enhancing relationships: pathways to positive outcomes for children impacted by abuse and neglect*. Child Welfare. Special edition "Global Perspectives on Neglect and Child Protection" 98(6), 177-201

NMT functional domains	HoNOSCA Scales						
	Behavioral	Impairment	Symptom	Social	Information	Clinical Score	Total Score
Sensory Integration	-.273*	-.235	-.248*	-.341*	-.068	-.396*	-.537*
Self Regulation	-.492*	-.348*	-.330*	-.495*	-.136	-.554*	-.525*
Relational	-.521*	-.343*	-.332*	-.583*	-.090	-.592*	-.549*
Cognitive	-.381*	-.436*	-.202*	-.479*	-.124	-.496*	-.471*

TSSC (self report) (n = 242)	TSSC: Mean (SD)		Change in score	Inferrential Statistics	
	Time 1	Time 2		t-test	p-value
Dissociation	53.51 (11.82)	51.24 (11.82)	2.277	2.846	.001
Dissociation - O	55.94 (10.95)	51.24 (11.08)	4.709	3.244	.005
Dissociation - F	51.79 (11.88)	49.85 (12.58)	1.966	2.802	.010
Sexual Concerns	53.50 (14.11)	50.50 (14.76)	3.101	2.402	.015
Sexual Concerns - P	52.47 (14.10)	50.29 (14.17)	2.583	2.192	.034
Sexual Concerns - O	54.06	51.33	2.739	1.863	.064

NMT: Current Functioning (n = 96)	NMT: Mean (SD)		Change in score	Inferential Statistics	
	Time 1	Time 2		Ftest	p value
Sensory Integration	80.24 (13.27)	81.75 (11.91)	1.55813	1.6273	.066
Self-Regulation	84.75 (13.27)	86.13 (14.55)	1.32485	4.815	.000
Relational	70.89 (15.07)	74.38 (13.95)	3.49256	3.514	.001
Cognitive	74.47 (18.99)	72.98 (15.91)	1.47718	1.406	.183

Note: Means and standard deviations are based on % of age typical scores, and higher scores over time indicate better functioning.

Outcomes Framework Domain	NMT Part C Domains	Hypothesized correlated outcome measure domain	Correlation
Child Safety	NMT Self-Regulation	SDQ Carer Conduct Problems	-.342**
	NMT Self-Regulation	SDQ Carer Hyperactivity	-.285**
	NMT Self-Regulation	TSCC: Sexual Concerns	-.145
	NMT Self-Regulation	TSCC: Anger	-.261
	NMT Self-Regulation	HoNOSCA: Behavior	-.493**

Outcome/ Framework Domain	NMT Part C Domains	Hypothesized correlated outcome measure domain	Correlation
Child Well-being	NMT Cognitive	HONOSCA: symptoms	-.202*
	NMT Cognitive	HONOSCA: Impairment	-.426**
	NMT Cognitive	TSCQ: Problems	-.147
	NMT Cognitive	TSCQ: Depression	-.262
	NMT Self-Regulation	SDQ: Career, Emotional Symptoms	-.166
	NMT Self-Regulation	SDQ: Career: Emotional Problems	-.342**
Family & Community Support	NMT Cognitive	SDQ: Career: Emotional Symptoms	-.209*
	NMT Cognitive	SDQ: Career: Emotional Problems	-.296**
	NMT: Relational	SDQ: Career: Peer Problems	-.314**
Stability/ Connectiveness	NMT: Relational	HONOSCA: Social	-.563**
	NMT: Relational	SDQ: Career: Pro-Social	-.190*

Outcomes Framework Domain	Child Outcome Description	NMT Part C Domains	Hypothesized correlated outcome measure domain
Child Safety	Reduction of harm related to child's behavior & promotion of safety	NMT Self-Regulation	SDQ Care: Conduct Problems
		NMT Self-Regulation	SDQ Care: Hyperactivity
		NMT Self-Regulation	TSCC: Sexual Concerns
		NMT Self-Regulation	TSCC: Anger
Child Well-being	Enhanced well-being and functioning	NMT Self-Regulation	HONOSCA: Behavior
		NMT Cognitive	HONOSCA: Symptoms
		NMT Cognitive	SDQ: Anxiety
		NMT Cognitive	SDQ: Depression
	Improved cognitive &/or language development	NMT Cognitive	HONOSCA: Impairment
		Improved school attendance &/or performance	NMT Self-Regulation
NMT Self-Regulation	SDQ Care: Conduct Problems		
Stability/ Connectedness	Strengthening social relationships, including cultural connection	NMT Cognitive	SDQ Care: Emotional Symptoms
		NMT Cognitive	SDQ Care: Conduct Problems
		NMT: Relational	SDQ Care: Peer Problems
Family and Community Support	Strengthening social networks Strengthening capacity of others to meet child's needs	NMT: Relational	HONOSCA: Social
		NMT: Relational	SDQ Care: Pro-Social

Adoption Advocate

[illegible]

Neurosequential Model Core Slides Selected Outcomes

NMT embedded in MSW Training
(Loyola, Chicago SSW)

The Neurosequential Model of Therapeutics (NMT): Helping Clients Move Beyond Trauma
By Christie Mason, Ph.D., LCSW

THE NEUROSEQUENTIAL MODEL of Therapeutics

Following the lead of Dr. Mason at Loyola, Chicago, multiple graduate programs in social work and education are integrating NMT concepts or NMT into their curricula; these include Case Western Reserve, University of Texas, Smith College, Cleveland State, and the University of Chicago.

NEUROSEQUENTIAL NETWORK™

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2020, VOL. 40, NO. 4, 352-371
https://doi.org/10.1080/08943233.2020.1786992

Routledge
Taylor & Francis Group

Including Neuroscience in Social Work Education: Introducing Graduate Students to the Neurosequential Model of Therapeutics
Christie Mason, Brian L. Kelly, and Virginia McConchie
School of Social Work, Loyola University Chicago, Chicago, Illinois, USA

ABSTRACT
To fill a gap in research on the incorporation of neuroscience in social work education, this article describes Master of Social Work (MSW) student and alumni experiences learning a neuroscience-informed model for practice with clients who have endured developmental trauma. The Neurosequential Model of Therapeutics (NMT) is a clinical decision-making tool that provides an estimate of how a client's current neurobiological functioning may have been impacted by trauma during the developmental period in order to inform the selection and sequencing of interventions. MSW students and alumni participated in focus groups exploring their perspectives on learning the NMT, the utility of the model in their work, and the fit between the model and social work theory and practice. Participants found the model helpful in conceptualizing client cases and applicable to their work, but challenging to implement due to others' lack of familiarity with the model, and insufficient infrastructure. These findings suggest the NMT may be a valuable tool for teaching neuroscience within schools of social work.

KEYWORDS
Neuroscience; trauma; social work education; Neurosequential Model of Therapeutics

NEUROSEQUENTIAL NETWORK™

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JOURNAL OF EMOTIONAL THERAPY
Volume 28
Number 1
2019

MAKING CONNECTIONS: SANDPLAY THERAPY AND THE NEUROSEQUENTIAL MODEL OF THERAPEUTICS
Loraine Ratti Freid
Bella Vista, USA

FOCUS
Neuroscience of the Human Hand/Neural Trauma Association

Implementing the Neurosequential Model of Therapeutics
In: What to Do When Children Clam Up in Psychotherapy: Interventions to Facilitate Communication (Cathy A. Malchiodi and David A. Crenshaw, Eds.) Guilford Press, NY pp. 38-50

A Neurosequential Therapeutics Approach to Guided Play, Play Therapy, and Activities for Children Who Won't Talk
Richard L. Gaskill
Bruce D. Perry

KARTELEGGING AV BARN MED «THE NEUROSEQUENTIAL MODEL OF THERAPEUTICS»

NEUROSEQUENTIAL NETWORK™

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NMT™
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The Neurosequential Model

Outcomes

NMT Core dataset studies

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Children Australia
Volume 43 | Number 2 | pp. 105-115 | © The Author(s) 2018 | doi:10.1017/cha.2018.21

Examining Developmental Adversity and Connectedness in Child Welfare-Involved Children
Erin P. Hambrick,^{1,2} Thomas W. Browner,^{3,4} and Bruce D. Perry^{1,4}

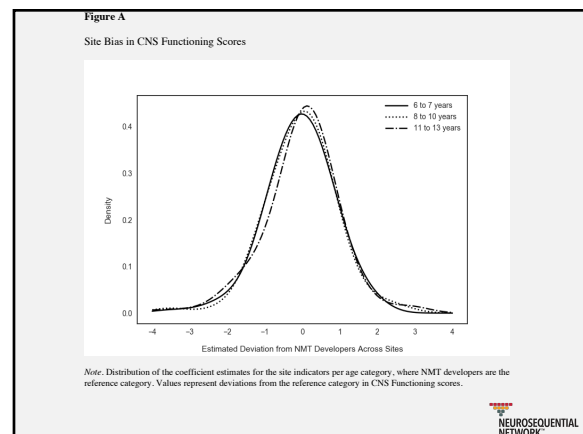
¹The ChildTrauma Academy, Houston, Texas, USA
²Department of Psychology, University of Missouri - Kansas City, Kansas City, Missouri, USA
³Center for Research Methods and Data Analysis, University of Kansas, Lawrence, Kansas, USA
⁴Department of Psychiatry, Northwestern University Feinberg School of Medicine, Chicago, Illinois, USA

Identifying optimal out-of-home placements for child welfare-involved youth is challenging. Examples of youth recovering within each "out-of-home" placement type (foster, relative, residential) are evident, as are examples of youth who are deteriorating. The heterogeneity in developmental history and current functioning of youth makes blanket policies regarding placement unwise. Examination of developmental heterogeneity and functioning of youth in the welfare system can provide insights about factors influencing outcomes, thereby informing practice, program and policy. We explore whether current relational health (connectedness) promotes positive outcomes for child welfare-involved youth while controlling for developmental risk (history of adverse, and lack of relationally positive, experiences). Clinicians at 19 organizations serving child welfare-involved youth used a neurodevelopmentally informed approach to intervention, the Neurosequential Model of Therapeutics (NMT), which includes metrics to assess the developmental timing of children's risk, "connectedness" and neurodevelopmental functioning (e.g., sleep, arousal, cortical control). Data-driven statistical techniques were used to produce stable, generalizable estimates. Risk during the perinatal (0-2 months) period significantly predicted children's functioning; current relational health predicted outcomes more strongly. Although early life developmental risk has a persistent effect on functioning, relationally supportive contexts may mitigate this risk. Improving relational contexts of child welfare-involved youth, regardless of placement type, is key.

Keywords: child trauma, child maltreatment, social support, neurosequential model, regularization

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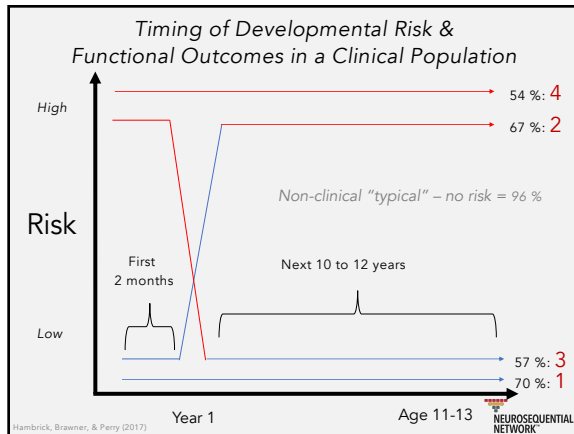
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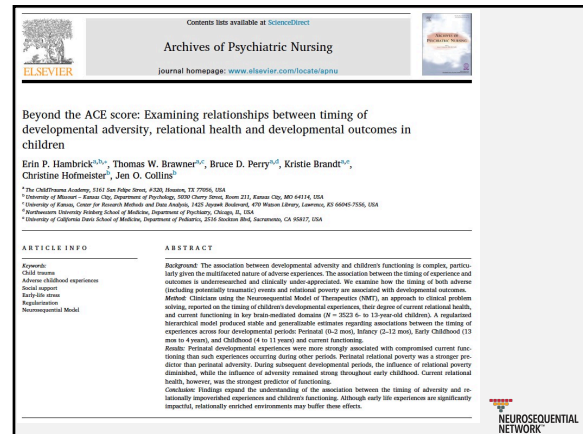
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Neurosequential Model Core Slides

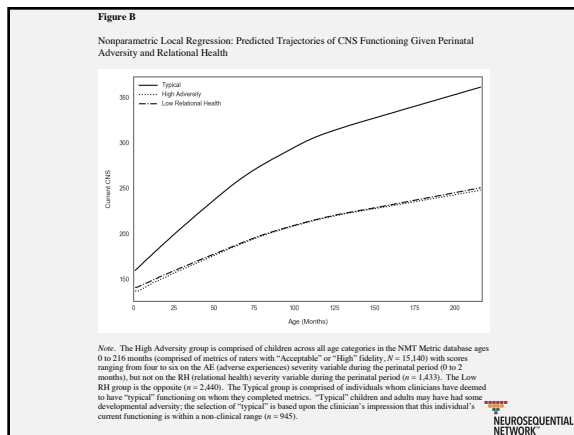
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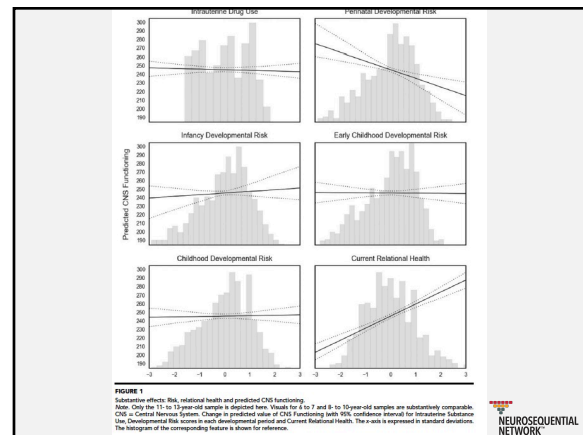
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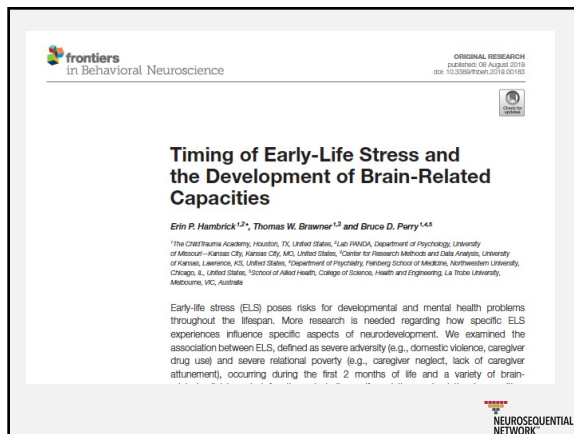
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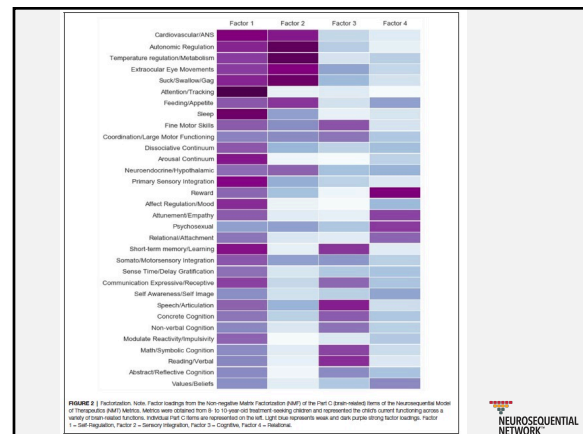
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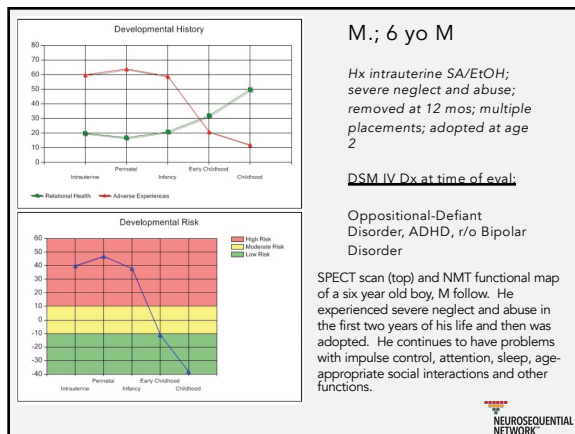
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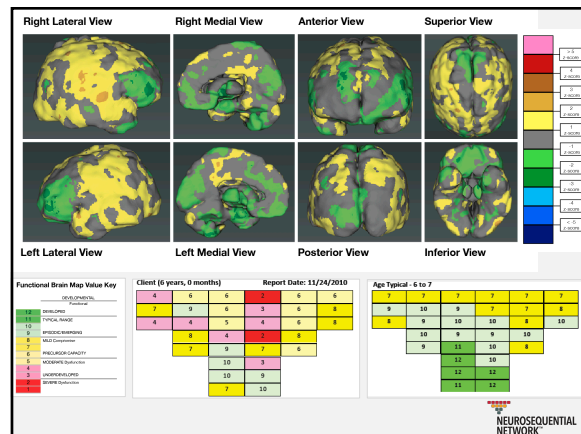
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Neurosequential Model Core Slides

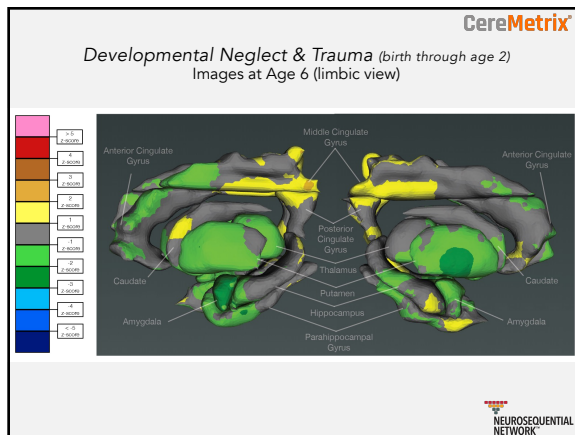
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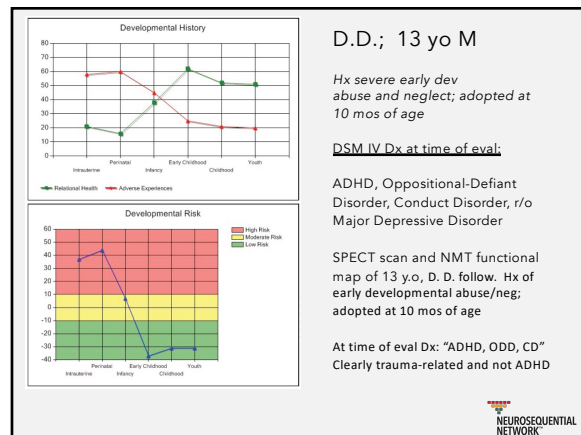
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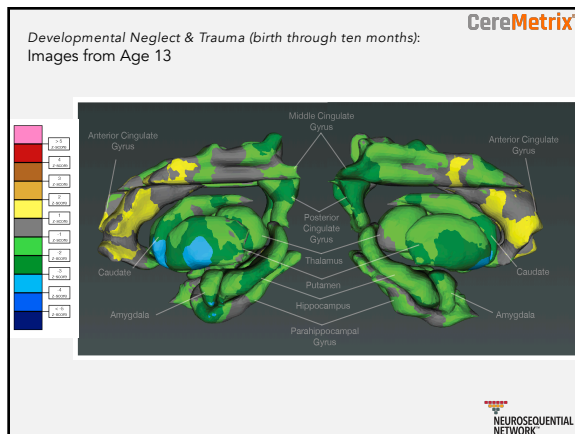
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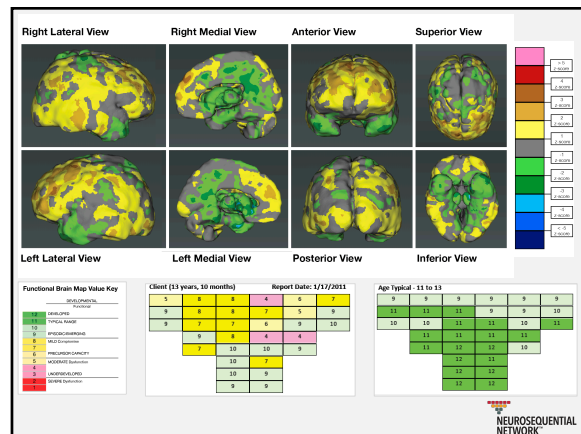
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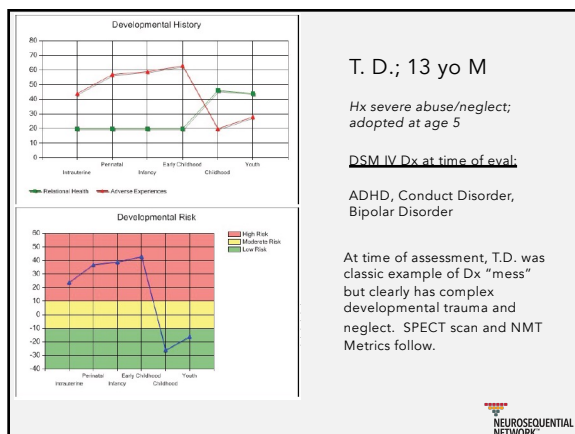


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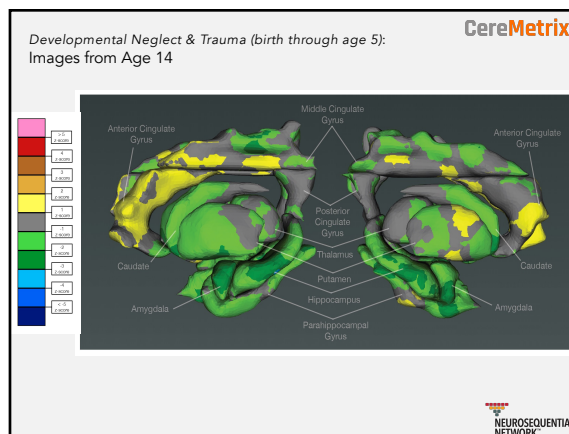


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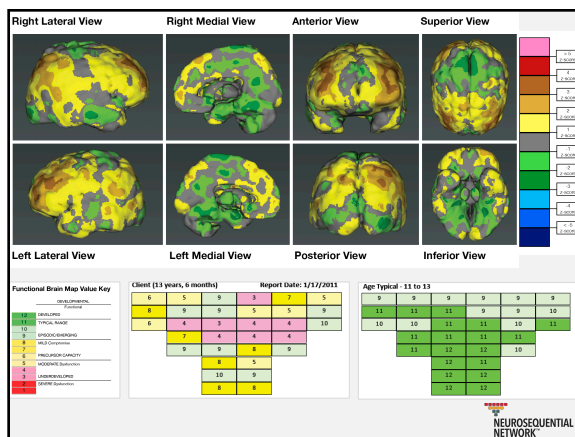
Neurosequential Model Core Slides Selected Outcomes



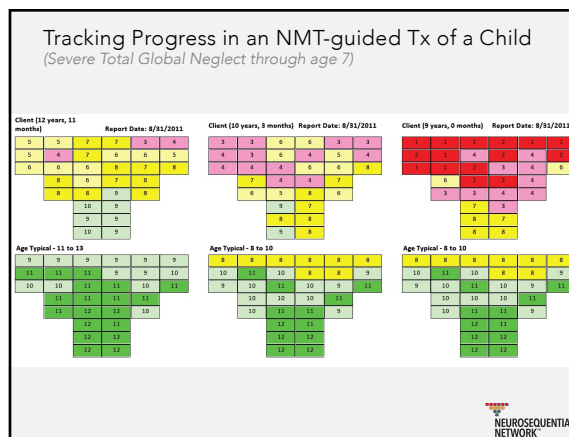
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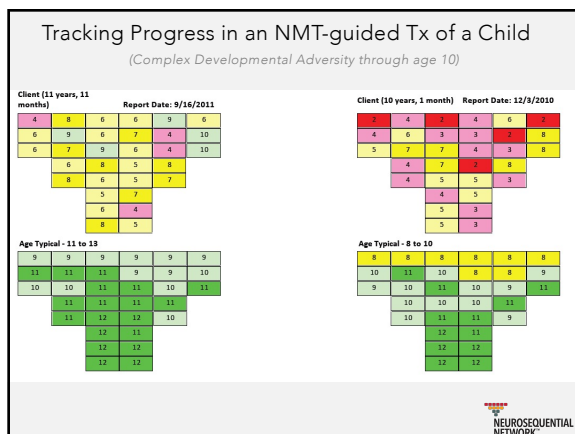
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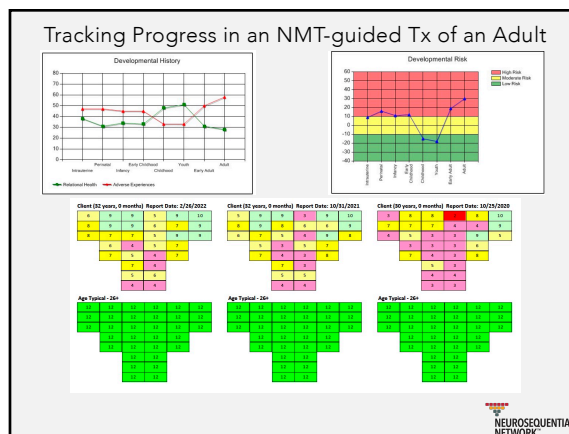
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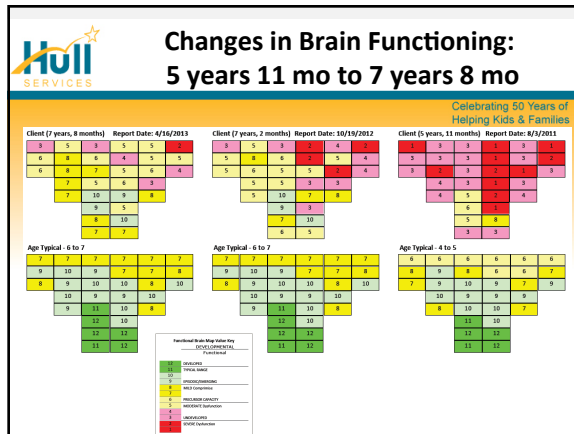


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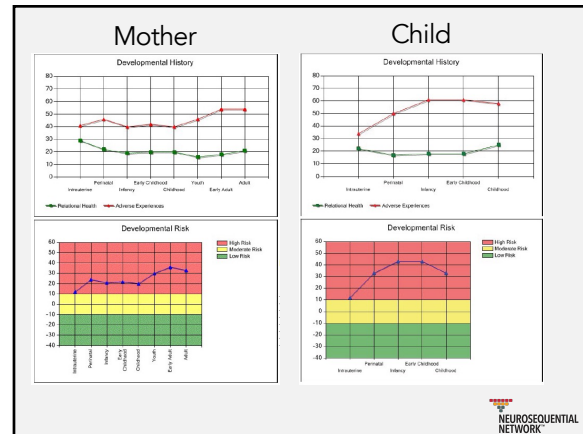


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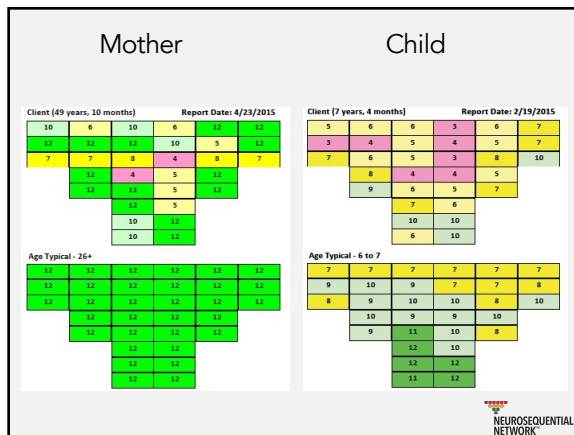
Neurosequential Model Core Slides Selected Outcomes



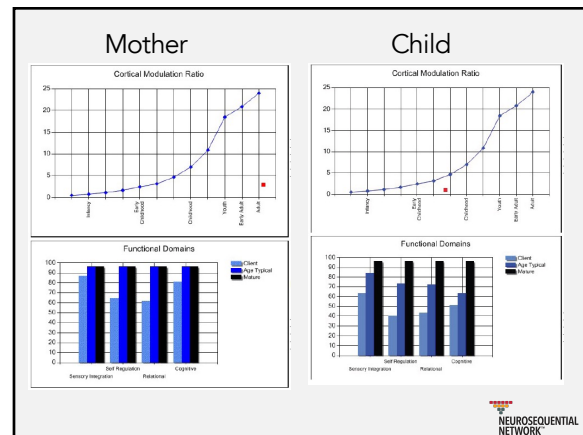
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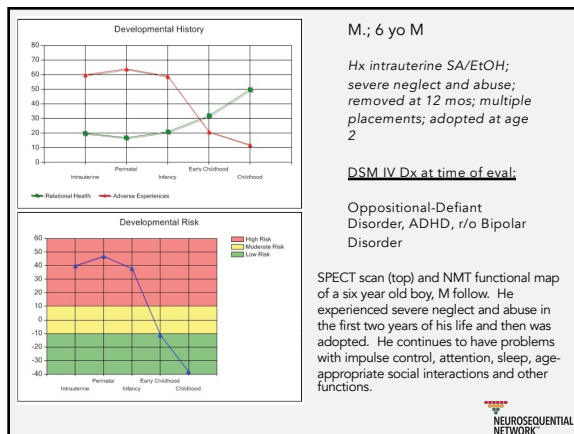
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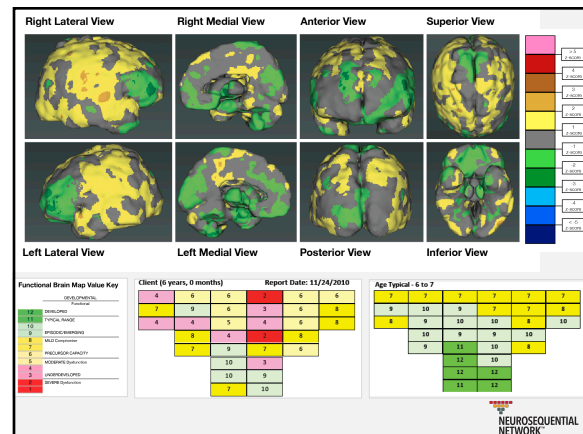
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Neurosequential Model Core Slides

Selected Outcomes




The Neurosequential Model

Reliability & Validity

NMT Clinical Practice Tools

(NMT Metrics)




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Validity: NMT Metrics

- **Face Validity** – Does it seem to measure what it says it does?
 - Demonstrated by high uptake in users
- **Predictive Validity** – Does it correlate with related constructs?
 - Demonstrated by covariation with clinical metrics with established validity
- **Concurrent Validity** – Does it distinguish between groups?
 - Demonstrated by associations between early trauma experiences and Brain Map Total scores that differ across developmental periods

Hambrick & Brawner, 2018




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Predictive Validity

Zarnegar, Hambrick, Perry, Azen, & Peterson (2016)

Correlations between NMT Metrics and Validated Clinical Scales			
	Battelle Developmental Inventory - 2 Total	Parenting Stress Index Total	NMT Brain Map Total
Battelle Developmental Inventory - 2 Total	--		
Parenting Stress Index Total	-.256	--	
NMT Brain Map Total	.674***	-.377*	--
NMT Cortical Modulation Ratio	.298	-.442**	.629***

Note: N=10. * = p<.10; ** = p<.05; *** = p<.01. Kendal Tau correlations are presented.



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Predictive Validity

SDQ & HoNOSCA

(n = 677)


NMT Functional Domain	Behavioural	Impairment	Symptoms	Social	Information	Clinical Score	Total Score
Sensory Integration	-.273**	-.235*	-.248**	-.347**	-.088	-.366**	-.337*
Self-Regulation	-.493**	-.348**	-.330**	-.489**	-.136	-.554**	-.525**
Relational	-.521**	-.343**	-.332**	-.563**	-.096	-.592**	-.549**
Cognitive	-.381**	-.436**	-.202*	-.479**	-.124	-.496**	-.471**

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

NMT Functional Domain	Emotional Symptoms	Conduct Problems	Hyperactivity	Peer Problems	Total Difficulties	Prosocial Behaviour
Sensory Integration	-.129	-.244**	-.184*	-.189*	-.263*	.221*
Self-Regulation	-.166	-.342**	-.283*	-.289*	-.380	.336*
Relational	-.202*	-.382**	-.181*	-.314**	-.376**	.190*
Cognitive	-.209*	-.296*	-.209*	-.249**	-.369**	.137

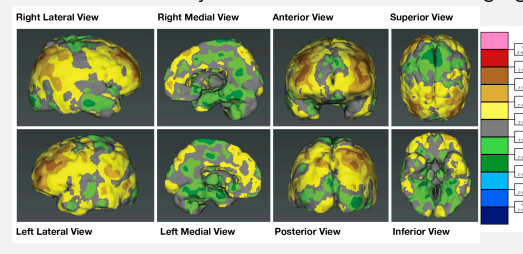
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Cox, A., Perry, B.D. & Frederico, M. (in press, 2020). *Reconstructing the system and enhancing relationships: pathways to positive outcomes for children impacted by abuse and neglect*. Child Welfare. Special edition "Global Perspectives on Neglect and Child Protection".



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Construct Validity: Correlation with Neuroimaging



Right Lateral View, Right Medial View, Anterior View, Superior View, Left Lateral View, Left Medial View, Posterior View, Inferior View

Functional Brain Map Value Key

Client (33 years, 6 months)	Report Date: 1/17/2013	Age Typical: 11 to 13
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
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33	33	33

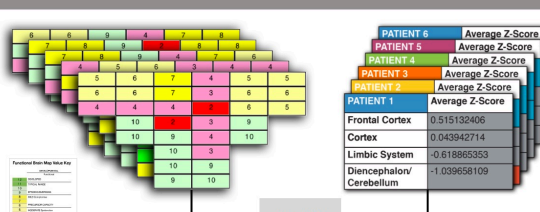


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Construct Validity: Correlation with Neuroimaging

Correlation Analysis


revealed relationships between NMT scores and qSPECT® data



Over 5,000 Comparisons

CereMetrix

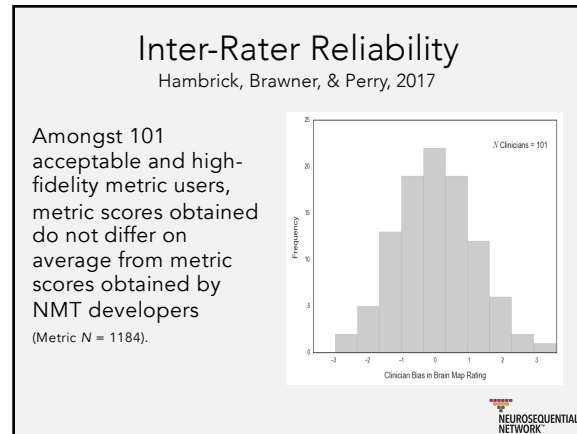
Quint, S., Kelly, J., Morris, H. & Quandt, L. (2019)



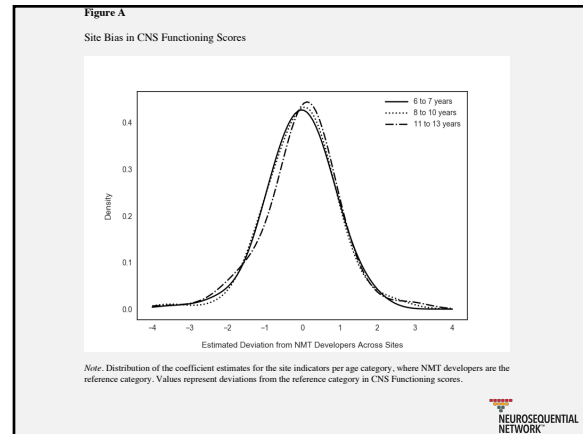
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Neurosequential Model Core Slides

Selected Outcomes



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Reliability

Internal Consistency

- Cronbach α
 - Do items measuring the proposed construct produce similar scores?
 - N = 3,523 6- to 13-year-old children (Hambrick, Brawner, & Perry, 2018)
 - Raters had “acceptable” or “high” NMT Metric fidelity ratings
 - Part C: Current Central Nervous System Functioning $\alpha = .95$
 - Part D: Current Relational Health $\alpha = .84$

Hambrick & Brawner, 2018

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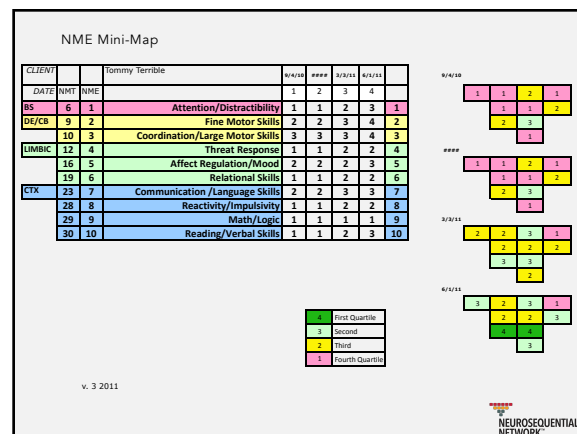
The Neurosequential Model

Outcomes

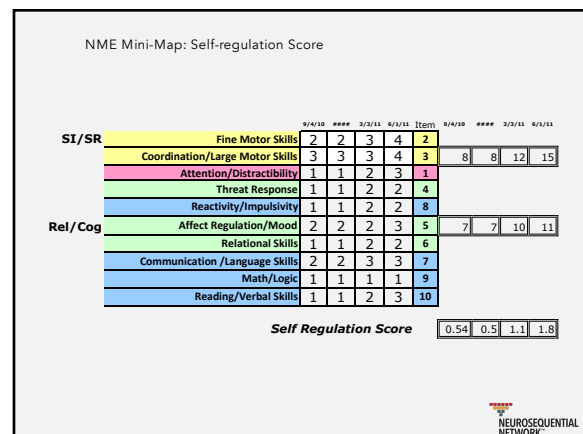
NME-related

NEUROSEQUENTIAL NETWORK

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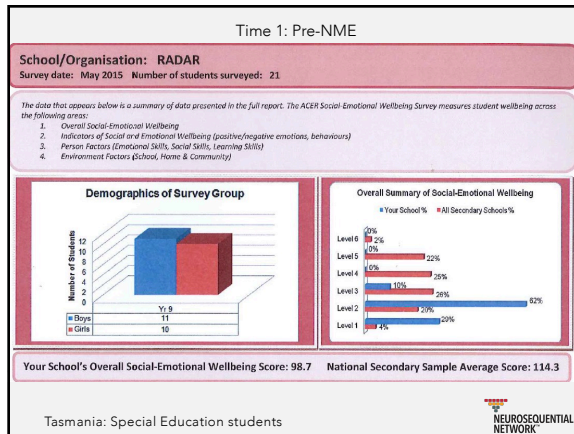


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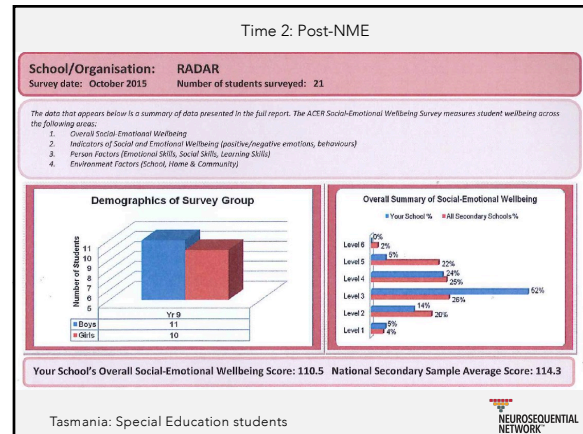


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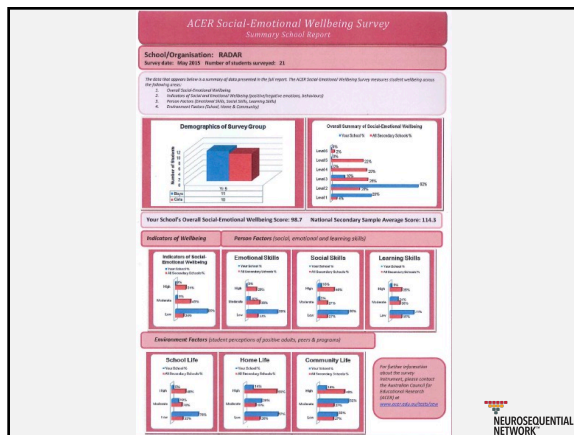
Neurosequential Model Core Slides Selected Outcomes



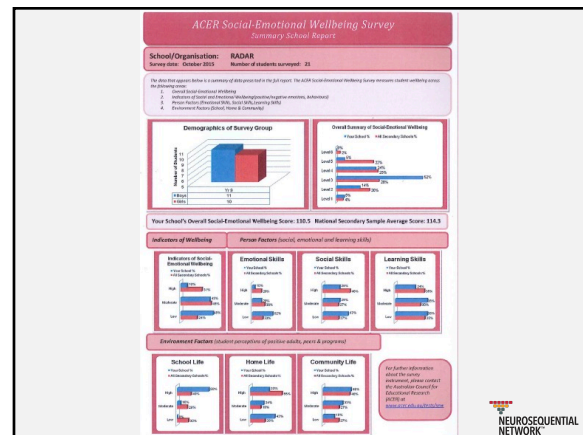
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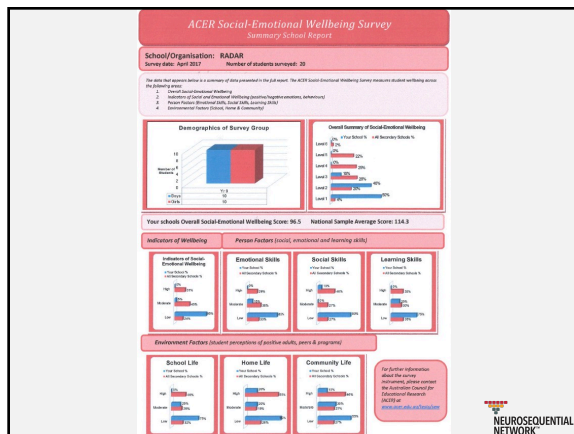
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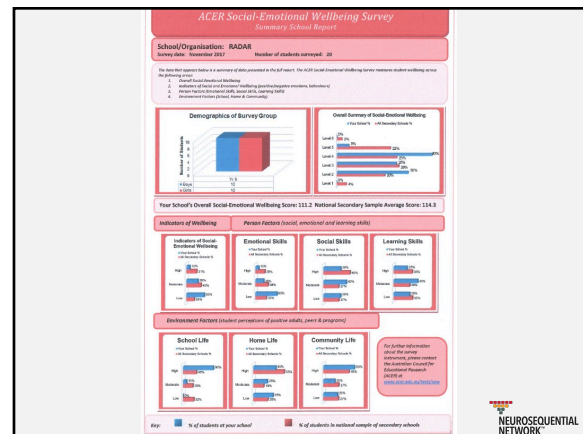
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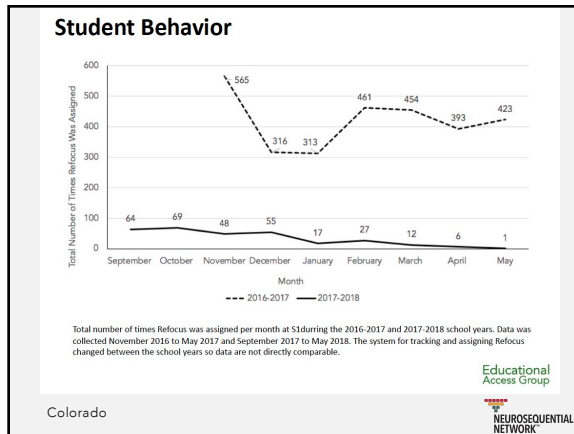
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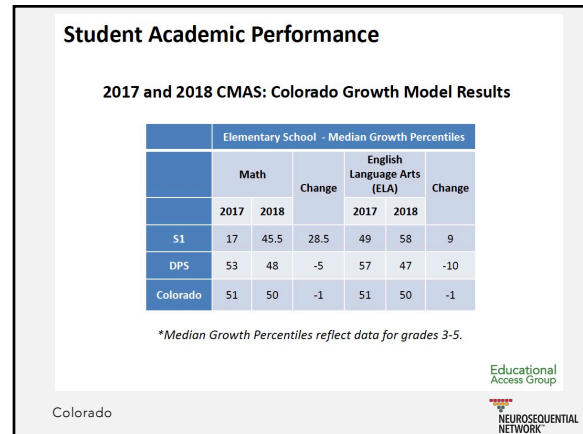
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Neurosequential Model Core Slides

Selected Outcomes



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Developing a trauma-informed approach to closing the poverty-related attainment gap

Lesley Taylor & Whitney Barrett

Aim: The development of a trauma-informed approach to closing the poverty-related attainment gap called Readiness for Learning (R4L). This is a project funded by the Scottish Attainment Challenge (SAC). This paper reports on a strand of the intervention that took place in two Primary One classrooms over the academic session 2017/18.

Method: This part of the project involved making changes to the learning environment and presentation of the curriculum, taking into greater account the developmental stage of children entering formal schooling. A selection of both qualitative and quantitative measures were completed throughout the year.

Findings: These indicated that pupils made significant gains in their executive function abilities, as measured using the Neurosequential Mini Map.

Limitations: The limitations of this study included the lack of a matched control and the potential confounding effect of co-occurring interventions. Longer term evaluation and follow-up with the cohort is planned to gather evidence of ongoing impact and attempt to address some of the limitations identified.

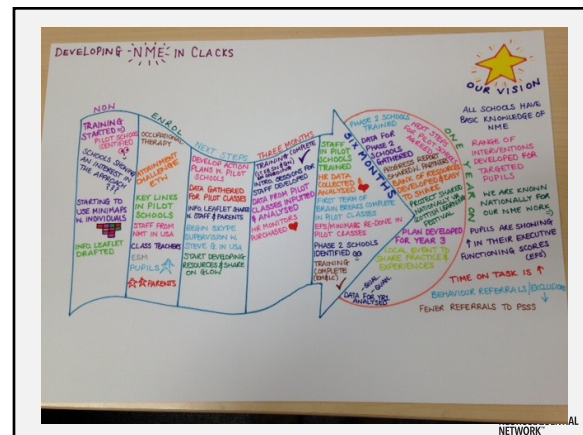
Discussion: Results will be discussed both in relation to pupil outcomes, as well as the wider involvement that the Educational Psychology Service (EPS) can have in relation to local authority policy and practice.

Key words: Trauma-informed practice; self-regulation; executive function.

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Educational & Child Psychology, Vol. 35 No. 3

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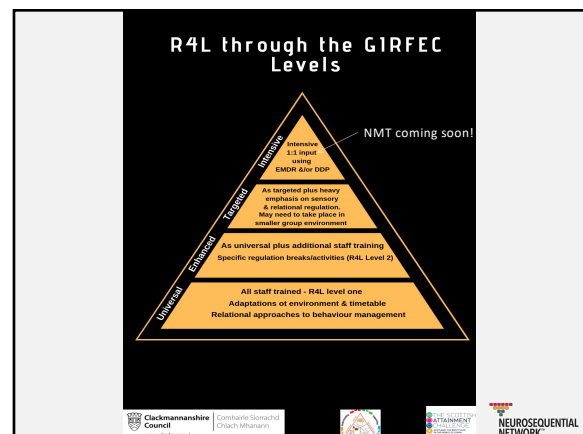
R4L- Ready for Learning

(R4L is an NME-based approach)

- BRIEF2 – R4L group showed **significant gains in all areas** of the BRIEF2, bringing them from the 'clinically at risk' category into the 'normal' category. In contrast, although the **non-R4L scores did not change significantly**, the scores for the group overall were heading in the wrong direction.
- Further analysis showed that **72% of the R4L pupils made a reliable positive change**, with most of the change happening in the Behaviour Regulation Domain. In contrast, **43% of the non-R4L class made reliable change but in the wrong direction**.

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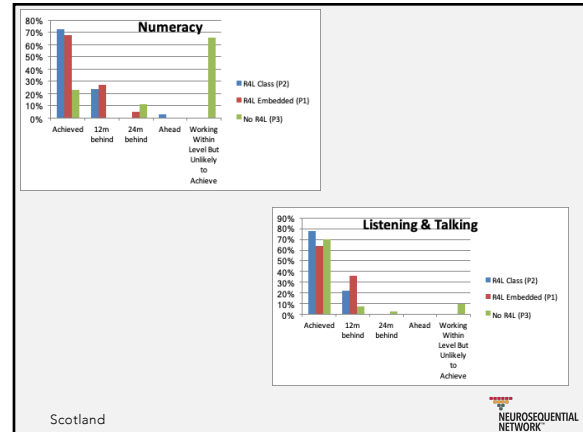
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What does an R4L classroom look like?

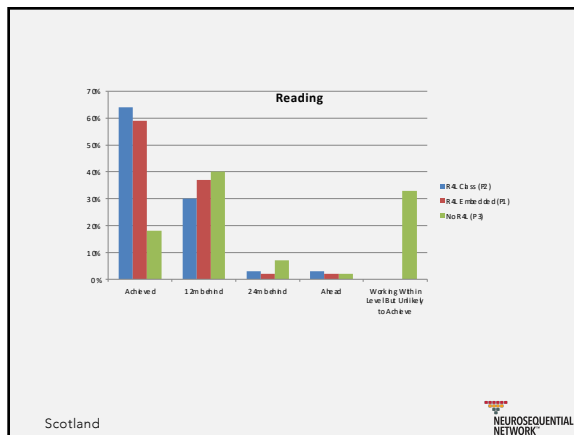
- 01 Care and thought is given to the physical and sensory environment
- 02 Educators understand the impact of stress on learners and themselves
- 03 Relationships are key
- 04 Brains, learning and development are understood neurosequentially
- 05 Time is spent helping all learners to regulate



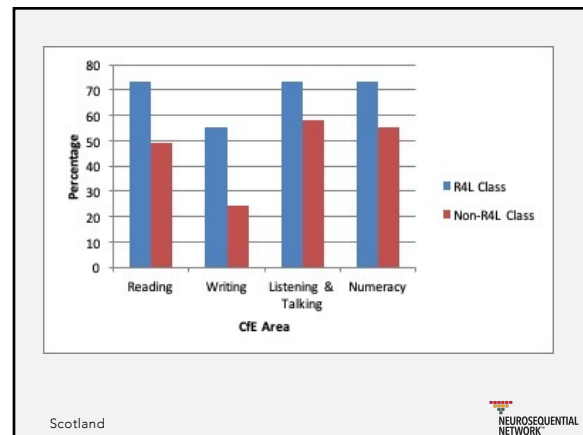
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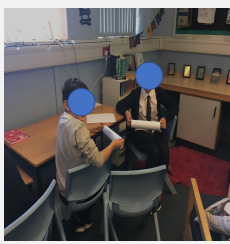


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R4L – Primary 7

Children's Views

- "It helps me with lots of things such as calming down or becoming alert. When I'm sleepy I do things like HAMA beads and quizzes and when I want to be calm I colour or use play-doh."
- "I struggle to sit for long periods of time, but the fidgets help me listen to the teacher."
- "NME helps me be calmer to learn, feel alert and to take it in."



Scotland




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Benefits

Evidence so far shows

- We have had a significant decrease in the number of times LA's are having to redirect play.
- An increase in pupils returning to class settled and ready to learn
- Staff positive attitudes and confidence levels have improved
- Pupils who previously attended lunch clubs are now able to spend some or all break times in the playground.

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Neurosequential Model Core Slides

Selected Outcomes

Impact

- Significant reduction in referrals and no exclusions.
- Significant rise in attendance. (approx. average 30%)
- Significant reduction in community offending (VPDs)

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Exclusions	2016/17	2017/18	2018/19
AD	0	0	0
HW	0	0	0
CM	3	0	0
KC	0	0	0
SB	2	0	0
CR	1	0	0
RH	3	0	0

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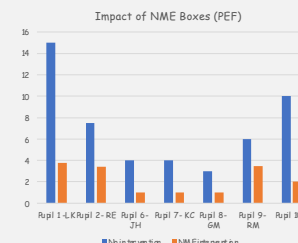
REFERRALS	2017/18	2018/19
AD	16	4
HW	16	1
CM	16	11
KC	67	8
SB	22	3
CR	21	0
RH	30	7

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WHAT IMPACT HAS IT HAD?

- Practitioner enquiry
- Qualitative and quantitative data

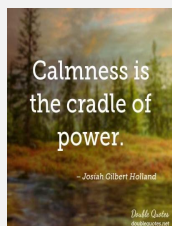


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STAFF OBSERVATIONS OF YOUNG PEOPLE

- "There has been a marked reduction in shouting out"
- "She is definitely less agitated when material from the NME box is being used"
- "He went from asking to go to the toilet 3 times in a period to none"
- "They now settle quickly and complete nearly all their work"



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PUPIL FEEDBACK

- "When I am hyper it the string helps me to focus"
- "A stressball helps and I don't care if no one else has one"
- "The music has been good with helping reduce shouting out over the teacher"

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Neurosequential Model Core Slides

Selected Outcomes

Westerville South HS

- Since NME started in 2017 – 35% increase in attendance
- Graduation rates up from 89.5 to 93.5
- Suspensions decreased by 50%

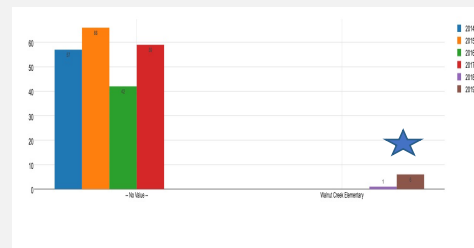
Ohio



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Walnut Creek ECP

DISCIPLINE INCIDENTS 2015 - 2020



Austin, TX (AISD)



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Introduction of NME Columbus Public Schools (2014-2015)

District	Year	# Office Referrals	# Detention, Suspension or Expulsion
Columbus City— Ohio Ave. ES	2013-14	917	129
	2014-15	750	83
Columbus City—Livingston ES	2013-14	2719	1043
	2014-15	1017	811
Graham School	2013-14	Not available	88
	2014-15	Not available	38
The Charles School	2013-14	Not available	97 (3 expulsions)
	2014-15	Not available	90 (0 expulsion)

Ohio



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Introduction of NME Columbus Public Schools (2014-2015)

First Grade teacher in Columbus City Schools:

"I would say that I became acutely aware of when I needed regulation and was able to quickly pull in an activity that allowed me to regulate myself which in turn kept my kids calmer. I found myself reacting less to the kids and instead wondering why are they doing this and how can I approach it differently to help them. In my classroom we actually kept data for an ed psych student and we were able to get transitions between activities from 11 to 12 minutes down to under 4 minutes consistently. I just used the tools you gave us and set a system in place where they had specific instructions and expectations and after less than a day they made a significant cut in time and in about a week we met our goal. I can also say that I gained about a half hour of instruction time each day from bathroom breaks. Once we started doing the rhythm activities in the hallway our bathroom breaks went from about 25 minutes to 15 minutes."

The NME training explained how to address behavioral disruptions that weren't punitive to the child but still helped the child to make better choices. Once I changed my approach with [male child in class] and gave him acceptable choices his office referrals significantly decreased (I seriously think it was about 3 or 4 a week to less than 1 a week) and I wasn't stressed out by his behaviors. I think you gave me the reminder that I can't control my students' behavior but I can teach them appropriate ways to deal with their thoughts and feelings. It's not about having a silent, seemingly perfect class. It's about building relationships with my kids and giving them the tools and space to become the wonderful little people that they are."



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Introduction of NME Columbus Public Schools (2014-2015)

Elementary Principal in Columbus City Schools:

"We have decreased our discipline referrals by almost 50% in one year. This means kids are in the classroom more and are developing self-regulation strategies that will help them be successful not only in school but in life."

"I, as the principal, am able to have more time to be in classrooms observing and providing feedback to teachers because my staff is equipped to deal with behaviors in the classroom instead of referring kids to the office for me to deal with."



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Introduction of NME Highland Elementary School (2016-2019)

- Complete elimination of Out of School suspensions (three years running)
- Gap closure in all student groups in reading and math
- From 0% (2016) to 48% (2019) in meeting standards
- Labeled a "model school" by Gov. Mike DeWine in 2019

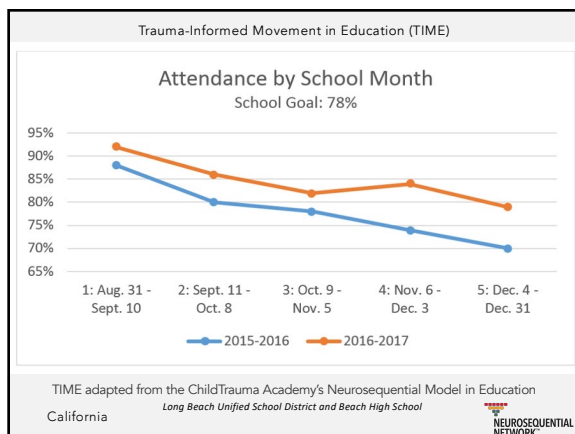
Ohio



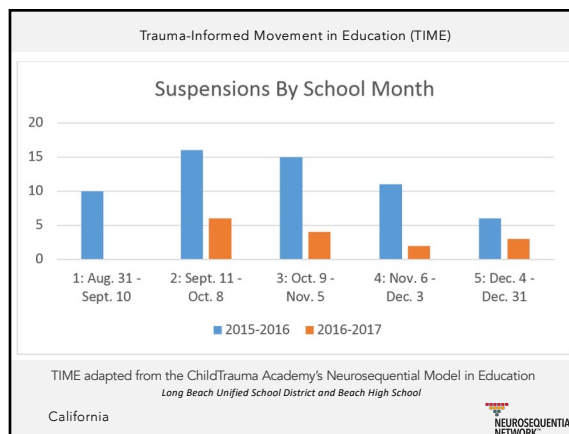
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Neurosequential Model Core Slides

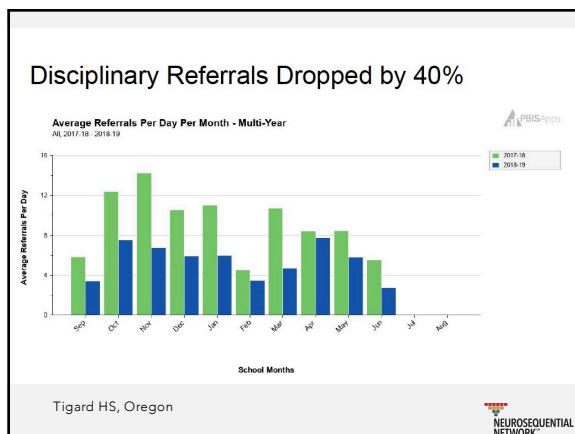
Selected Outcomes



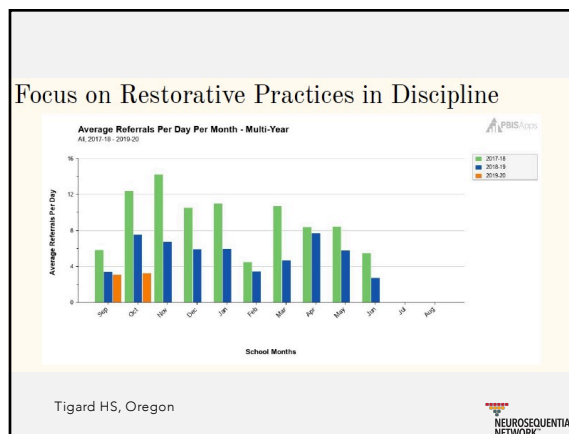
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Post Pilot

Tigard High has two new teachers being NME trained **Special Education Teacher** Christy Goodell and **Biology Teacher** Geoff Jarman and two new psychologists being NMT trained Tigard School Psychologist **Lynelle Benit** and District TOSA **Alyssa Anderson**.

Tigard High ARTIC (Attitudes Related to Trauma Informed Care) Survey Data demonstrated an overwhelming positive gain for NME trained staff when compared to non NME trained staff. The mean for all staff improved over the length of the pilot however.

Tigard HS, Oregon

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Graduation Rates Increased in 2017-2018

2017-2018 graduation rate increased by almost 4%

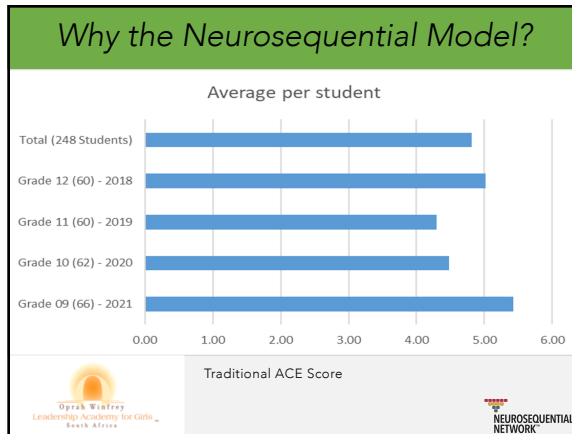
- Latin-x increase 16%
- SPED increase 21%
- Econ. Disadv. increase 9%
- ELL increase 10%

Tigard HS, Oregon

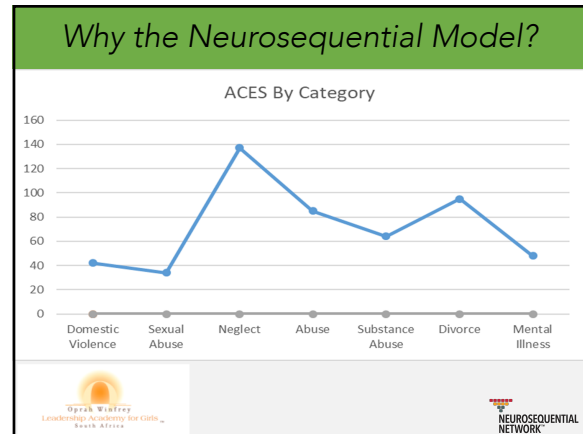
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Neurosequential Model Core Slides

Selected Outcomes



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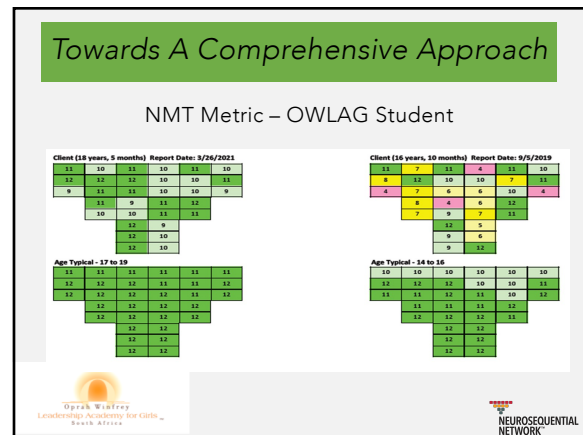
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Evidence of NM Impact

Clinical outcome data tells us that...

- Suicidality – has reduced
- Red flag Cases reduced and normalised than before
- Psychiatric referrals more investigative than crises
- Numbers in sickbay reduced
- Behavioral challenges – reduced

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Developing a trauma-informed approach to closing the poverty-related attainment gap

Lesley Taylor & Whitney Barrett

Aim: The development of a trauma-informed approach to closing the poverty-related attainment gap called *Readiness for Learning (RfL)*. This is a project funded by the Scottish Attainment Challenge (SAC). This paper reports on a strand of the intervention that took place in two Primary One classrooms over the academic session 2017/18.

Method: This part of the project involved making changes to the learning environment and presentation of the curriculum, taking into greater account the developmental stage of children entering formal schooling. A selection of both qualitative and quantitative measures were completed throughout the year.

Findings: These indicated that pupils made significant gains in their executive function abilities, as measured using the Neurosequential Mini Map.

Limitations: The limitations of this study included the lack of a matched control and the potential confounding effect of co-occurring interventions. Longer term evaluation and follow-up with the cohort is planned to gather evidence of ongoing impact and attempt to address some of the limitations identified.

Discussion: Results will be discussed both in relation to pupil outcomes, as well as the wider involvement that the Educational Psychology Service (EPS) can have in relation to local authority policy and practice.

Key words: Trauma-informed practice; self-regulation; executive function.

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Scotland

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The Neurosequential Model

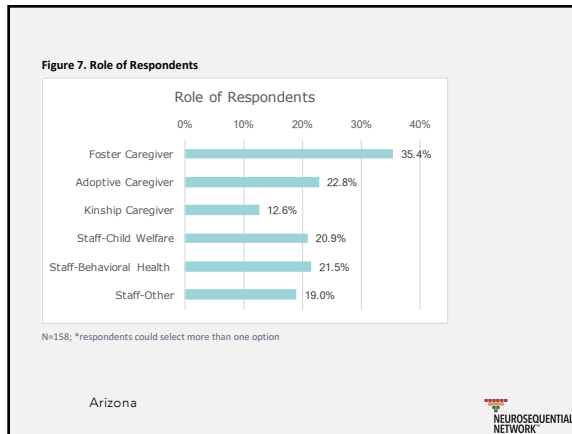
Outcomes

NMC-related

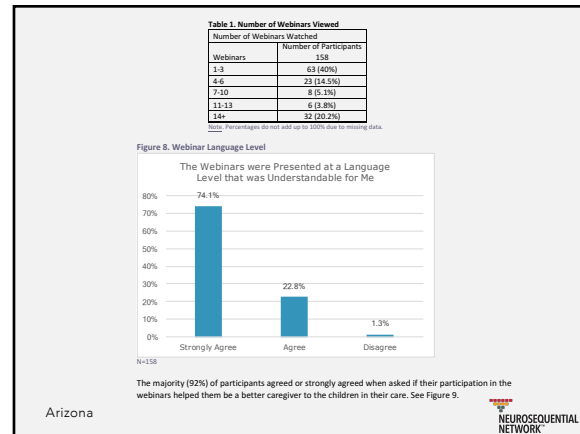
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Neurosequential Model Core Slides

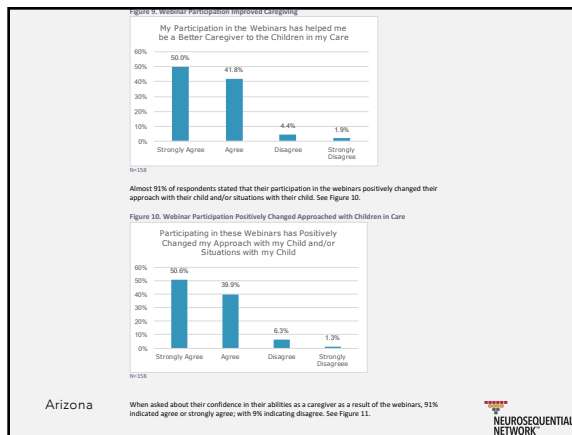
Selected Outcomes



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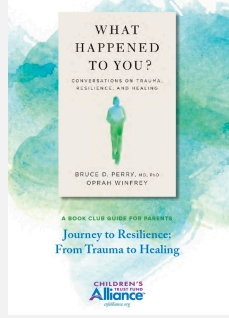
Table 5. Webinar Usefulness Compared by Number of Webinars Viewed

Statement	Viewed 1-3 webinars in Agreement N=86	Viewed More than 6 webinars in Agreement N=46
	N (%)	N (%)
The webinars were presented at a language level that was understandable for me.	78 (91%)	46 (100%)
My participation in the webinars has helped me be a better caregiver to the children in my care.	76 (88%)	44 (96%)
Participating in these webinars has positively changed my approach with my child and/or situations with my child.	78 (91%)	44 (96%)
I feel more confident in my abilities as a caregiver as a result of these webinars.	76 (88%)	42 (91%)
I will use the information presented in the webinars to improve my caregiving skills.	84 (98%)	33 (72%)

Arizona



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WHAT HAPPENED TO YOU?
CONVERSATIONS ON TRAUMA, RESILIENCE, AND HEALING
BRUCE D. PERRY, MD, PhD
OPRAH WINFREY

A BOOK CLUB GUIDE FOR PARENTS
Journey to Resilience: From Trauma to Healing
CHILDREN'S TRUST ALLIANCE

INTRODUCTION TO THE BOOK CLUB CONCEPT

When diagnosed with PTSD, Dr. Bruce Perry and Oprah Winfrey's conversation about trauma and resilience is a powerful one. This book club concept for parents allows them to connect with each other and learn from each other's experiences.


GOALS

- To provide a safe space for parents to share their experiences and learn from each other's.
- To provide a safe space for parents to learn from each other's experiences and learn from each other's.
- To provide a safe space for parents to learn from each other's experiences and learn from each other's.


GOALS

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ctfalliance.org/partnering-with-parents/book-club/



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