



ZENGAR RESEARCH CONFERENCE 2014

Cognitive Connections

&

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Marc DeLong, BS, CCCM



Cognitive Connections

Staff:

Lise' - me
Marc - him
Joe - IT
Sam - Office Manager
Marilyn - Technician
Lizzie - Assistant
Mia - ESA
Fergie - ESA

Locations:

Greenwood, IN
Walnut Creek, CA
Brentwood, CA

*Fishers, IN
*Concord, CA
*Palo Alto, CA
*Pleasanton, CA

* = Affiliate Office



Fergie & Mia our ESA



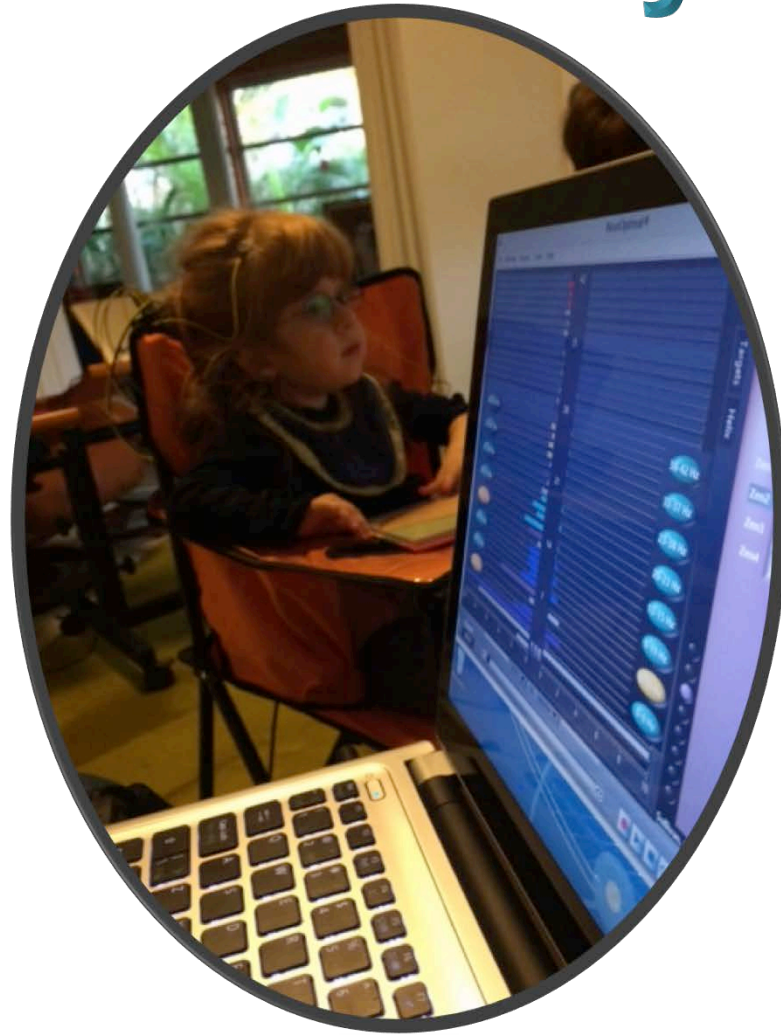
Trying to quantify
a NeurOptimal
experience is like...

Trying to measure
the exact amount of
oxytocin emitted
while experiencing
an a orgasm



2 Specific Case Studies & Several Anecdotal Cases

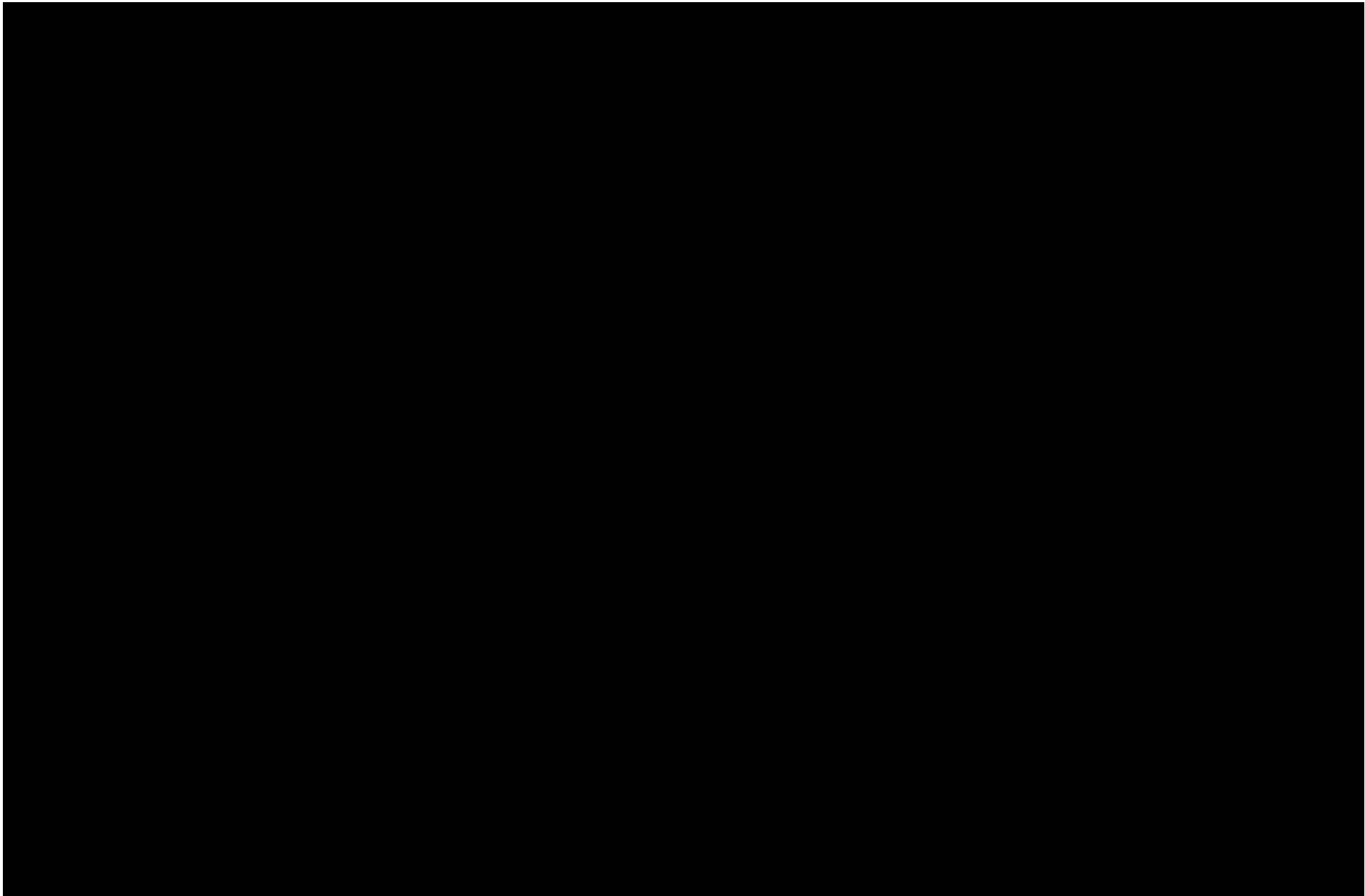
The Story of D



D's Medical History

A Rare Genetic Chromosomal Disorder

- Duplication of the 1st and 13th chromosome
- No Exact Cases in Medical Literature
- 8 similar cases that have duplication of 1q32-44
- Cognitively they range from moderate to severe
- Motorically some walk at 2 - 6 yrs old, 5 of 8 of the Children Talk while 3 are nonverbal
- Heart: Atrial Septal Defect
- Patent foramen ovale, Patent ductus arteriosus
- Pyloric Stenosis: Failure to Thrive
- Had surgery and recovered, has since gained weight
- Some of the other 8 cases have seizures- therefore is followed by Neurologist
- Strabismus intermittent cross right eye, Wears glasses 95 % of time
- Developmentally Delayed Globally, PT, OT, SLP, Music Therapy, Infant Stim. Teacher
- Sickness: History of Ear & Bladder Issues, Chronic Constipation, Strep & Virus' and Allergies





Research Design:

Single Case Study

Family purchased professional system

Protocol:

Montage: C3, C4, ipsilateral ear

Zen protocols:

3, 3, 0, 3

5, 5, 0, 5

8, 8, 0, 8

11,11,0,11

7, 7, 5, 7 (added Zen 3)

58 total sessions to date



Therapies used in conjunction with NeurOptimal:

Occupational Therapy
Speech and Language Therapy
Physical Therapy
Cognitive Rehabilitation Therapy
Infant Stimulation Teacher
Medications/Neutraceuticals

Private Preschool



Gross Motor

Perceptual Motor

Name: [redacted] Date of Evaluation 01/10/14

Cognitive Connections Gross Motor Rating Sheet

0 - 4 months	Achieved	12 - 16 months	Achieved	36 - 48 months	Achieved
1 Accepts liquid	<input checked="" type="checkbox"/>	33 Stacks 2 cubes (2" cubes)	<input type="checkbox"/>	61 Stacks 9 cubes	<input type="checkbox"/>
2 Lifts head/chin	<input checked="" type="checkbox"/>	34 Stands alone	<input type="checkbox"/>	62 Rides tricycle	<input type="checkbox"/>
3 Head bobs	<input checked="" type="checkbox"/>	35 Creeps up stairs	<input type="checkbox"/>	63 Pushes wheelbarrow	<input type="checkbox"/>
4 Puts hand to mouth	<input checked="" type="checkbox"/>	36 Walks alone	<input type="checkbox"/>	64 Throws ball	<input type="checkbox"/>
5 Moves head side to side	<input checked="" type="checkbox"/>	37 Sitting	<input type="checkbox"/>	65 Kicks ball	<input type="checkbox"/>
6 Raises head /chest	<input checked="" type="checkbox"/>	38 Stands with support	<input type="checkbox"/>	66 Throws with armswing	<input type="checkbox"/>
7 Holds head erect	<input checked="" type="checkbox"/>			67 Climbs stairs	<input type="checkbox"/>
8 Puts objects to mouth	<input checked="" type="checkbox"/>				
9 Reaches grossly	<input checked="" type="checkbox"/>				
10 Keeps hands open	<input checked="" type="checkbox"/>				
4 - 8 months					
11 Sits alone	<input checked="" type="checkbox"/>				
12 Explores objects	<input checked="" type="checkbox"/>				
13 Pulls to sitting	<input checked="" type="checkbox"/>				
14 Rolls from back to side	<input checked="" type="checkbox"/>				
15 Rolls from stomach to back	<input checked="" type="checkbox"/>				
16 Holds with palmar grasp	<input checked="" type="checkbox"/>				
17 Sits alone	<input checked="" type="checkbox"/>				
18 Stands with support	<input checked="" type="checkbox"/>				
19 Reaches and takes	<input checked="" type="checkbox"/>				
20 Rolls from back to stomach	<input checked="" type="checkbox"/>				
21 Sits / 10 minutes	<input checked="" type="checkbox"/>				
22 Transfers hand to hand	<input checked="" type="checkbox"/>				
8 - 12 months					
23 Stands w/ furniture support	<input checked="" type="checkbox"/>				
24 Rotates in sitting	<input checked="" type="checkbox"/>				
25 Creeps	<input checked="" type="checkbox"/>				
26 Cruises	<input checked="" type="checkbox"/>				
27 Pincer grasp	<input checked="" type="checkbox"/>				
28 Crawls	<input checked="" type="checkbox"/>				
29 Pulls to standing	<input checked="" type="checkbox"/>				
30 Walks with aid	<input checked="" type="checkbox"/>				
31 Lowers self to sitting	<input checked="" type="checkbox"/>				
32 Throws without release	<input checked="" type="checkbox"/>				

Name: [redacted] Date of Evaluation 01/10/14

Cognitive Connections Perceptual-Motor Rating Sheet

0 - 4 month	Achieved	16 - 20 months	Achieved	36 - 48 months	Achieved
1 Fixates on near objects	<input checked="" type="checkbox"/>	30 Places 3 pegs	<input type="checkbox"/>	51 Builds block train	<input type="checkbox"/>
2 Follows object	<input checked="" type="checkbox"/>	31 Points to named picture	<input type="checkbox"/>	52 Stacks 10 cubes	<input type="checkbox"/>
3 Movements cease fixating	<input checked="" type="checkbox"/>	32 Stacks 4 cubes	<input type="checkbox"/>	53 Identifies circle	<input type="checkbox"/>
4 Smiles at familiar faces	<input checked="" type="checkbox"/>	20 - 24 months			
5 Follows across midline	<input checked="" type="checkbox"/>	33 Identifies color	<input type="checkbox"/>		
6 Reverses visual pursuit	<input checked="" type="checkbox"/>	34 Finds object	<input type="checkbox"/>		
7 Reaches imprecisely	<input checked="" type="checkbox"/>	35 Finds object	<input type="checkbox"/>		
8 Fixates at 3 feet	<input checked="" type="checkbox"/>	36 Pursues 180 degrees	<input type="checkbox"/>		
9 Pursues 180 degrees	<input checked="" type="checkbox"/>				
4 - 8 months					
10 Turn toward sound	<input checked="" type="checkbox"/>				
11 Inspects hands	<input checked="" type="checkbox"/>				
12 Plays with rattle	<input checked="" type="checkbox"/>				
13 Holds object in each hand	<input checked="" type="checkbox"/>				
14 Reaches and grasps	<input checked="" type="checkbox"/>				
15 Imitates simple actions	<input checked="" type="checkbox"/>				
16 Reaches w/ one hand	<input checked="" type="checkbox"/>				
17 Drops and picks up	<input checked="" type="checkbox"/>				
8 - 12 months					
18 Attends to many	<input checked="" type="checkbox"/>				
19 Holds two blocks in one hand	<input checked="" type="checkbox"/>				
20 Pincer grasp	<input checked="" type="checkbox"/>				
21 Imitates pat-a-cake	<input checked="" type="checkbox"/>				
22 Recovers / obstacle	<input checked="" type="checkbox"/>				
23 Imitates peek-a-boo	<input checked="" type="checkbox"/>				
12 - 16 months					
24 Puts objects in container	<input checked="" type="checkbox"/>				
25 Marks with crayon	<input checked="" type="checkbox"/>				
26 Removes from container	<input checked="" type="checkbox"/>				
27 Formboard / circle	<input checked="" type="checkbox"/>				
28 Stacks 3 cubes	<input type="checkbox"/>				
29 Scribbles on paper	<input type="checkbox"/>				

These are the most difficult areas for her...and decreases her overall score dramatically



Language

Cognitive

Name: [redacted] Date of Evaluation 01/10/14

Cognitive Connections Language Rating Sheet

0 - 4 months	Achieved	20 - 24 months	Achieved	36 - 48 months	Achieved
1 Reflexive Sounds	<input checked="" type="checkbox"/>	28 Points to 3-5 parts of doll	<input checked="" type="checkbox"/>	36 Performs 2 commands	<input checked="" type="checkbox"/>
2 Cries differentially	<input checked="" type="checkbox"/>	29 Names 3 objects	<input checked="" type="checkbox"/>	37 Word memory	<input checked="" type="checkbox"/>
3 Reacts to human voice	<input checked="" type="checkbox"/>	30 Names 3 objects	<input checked="" type="checkbox"/>	38 Identifies objects	<input checked="" type="checkbox"/>
4 Coos	<input checked="" type="checkbox"/>	31 Says "no"	<input checked="" type="checkbox"/>	39 Asks questions	<input checked="" type="checkbox"/>
5 Responds to social stimulus	<input checked="" type="checkbox"/>	32 Asks questions	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
4 - 8 months					
6 Turns toward sound	<input checked="" type="checkbox"/>				
7 Vocalizes / express emotions	<input checked="" type="checkbox"/>				
8 Babbles	<input checked="" type="checkbox"/>				
8 - 12 months					
9 Vocalizes / attention	<input checked="" type="checkbox"/>				
10 Imitates gestures	<input checked="" type="checkbox"/>				
11 Responds to "no"	<input checked="" type="checkbox"/>				
12 Imitates sounds	<input checked="" type="checkbox"/>				
13 Responds / words, gestures	<input checked="" type="checkbox"/>				
14 Babbles / inflections	<input checked="" type="checkbox"/>				
12 - 16 months					
15 Produces sound sequences	<input checked="" type="checkbox"/>				
16 Imitates words	<input checked="" type="checkbox"/>				
17 Waves / "bye bye"	<input checked="" type="checkbox"/>				
18 Follows simple directions	<input checked="" type="checkbox"/>				
19 Says 2+ words	<input checked="" type="checkbox"/>				
16 - 20 months					
20 Vocabulary 3-50 words	<input checked="" type="checkbox"/>				
21 Simple questions	<input checked="" type="checkbox"/>				
22 Asks for 2 things	<input checked="" type="checkbox"/>				
23 Points to picture	<input checked="" type="checkbox"/>				
24 "Hello", "thank you"	<input checked="" type="checkbox"/>				
25 Names picture	<input checked="" type="checkbox"/>				
26 Jargon	<input checked="" type="checkbox"/>				
27 Knows 12+ objects	<input checked="" type="checkbox"/>				

Name: [redacted] Date of Evaluation 01/10/14

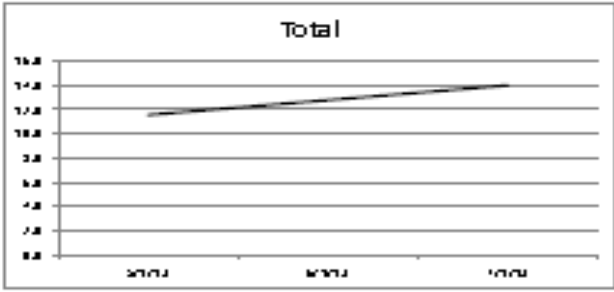
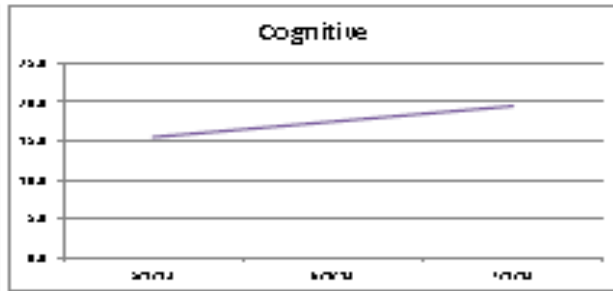
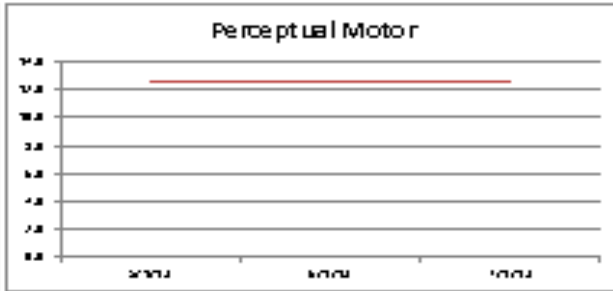
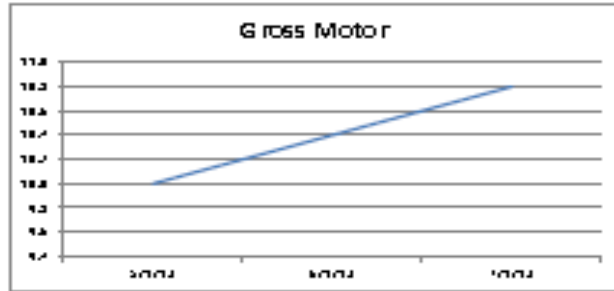
Cognitive Connections Cognitive Rating Sheet

0 - 4 months	Achieved	24 - 36 months	Achieved	48 - 60 months	Achieved
1 Responds to sudden voice	<input checked="" type="checkbox"/>	21 Matches like objects	<input checked="" type="checkbox"/>	48 Names Cross	<input checked="" type="checkbox"/>
2 Responds to sound of rattle	<input checked="" type="checkbox"/>	22 3-piece formboard	<input checked="" type="checkbox"/>	49 Activities to day	<input checked="" type="checkbox"/>
3 Awareness of new situations	<input checked="" type="checkbox"/>	23 Turns pages, etc.	<input checked="" type="checkbox"/>	50 Identifies halves	<input checked="" type="checkbox"/>
4 Reacts to sight of toy	<input checked="" type="checkbox"/>	24 Counts 2 objects	<input checked="" type="checkbox"/>	51 Identifies halves	<input checked="" type="checkbox"/>
4 - 8 months					
5 Discriminates strangers	<input checked="" type="checkbox"/>	25 Imitates	<input checked="" type="checkbox"/>		
6 Turns to look for dropped spoon	<input checked="" type="checkbox"/>	26 Knows	<input checked="" type="checkbox"/>		
7 Plays peek-a-boo	<input checked="" type="checkbox"/>	27 Imitates	<input checked="" type="checkbox"/>		
8 Uncovers toy	<input checked="" type="checkbox"/>				
8 - 12 months					
9 Responds to name	<input checked="" type="checkbox"/>				
10 Looks at pictures in books	<input checked="" type="checkbox"/>				
11 Squeezes doll to make squeak	<input checked="" type="checkbox"/>				
12 Looks in correct place for toys that roll out of sight	<input checked="" type="checkbox"/>				
12 - 18 months					
13 Imitates putting objects in box	<input checked="" type="checkbox"/>				
14 Follows simple commands	<input checked="" type="checkbox"/>				
15 Points to 1 body part	<input checked="" type="checkbox"/>				
16 Attains toy with stick	<input checked="" type="checkbox"/>				
18 - 24 months					
17 Follows one step direction	<input checked="" type="checkbox"/>				
18 Tries to sing	<input checked="" type="checkbox"/>				
19 Follows 3 directions with ball	<input checked="" type="checkbox"/>				
20 Discriminates 2 -cup, plate, box	<input checked="" type="checkbox"/>				

Language and Cognition show intelligence...growth in these areas confirm capability...this equates to hope



First 3 months of NeurOptimal Training





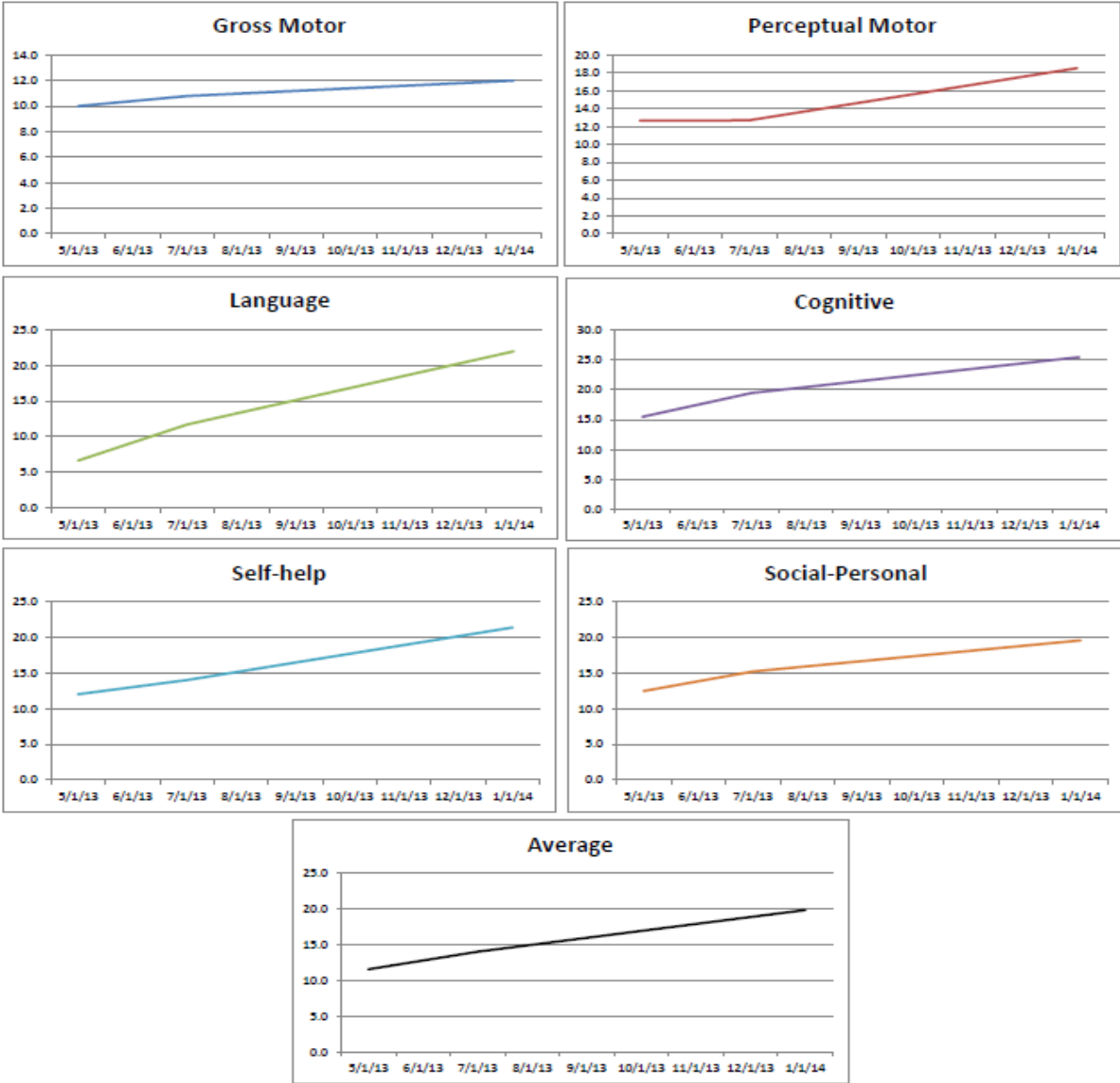
Child's Name D **Date of Birth** 11/9/10
School _____ **Teacher** _____
Initial Assessment Date 5/23/13 **Second Assessment Date** 1/12/14
Age at Initial Assessment 2.6 **Age at Final Assessment** 3.2
(years, months) (years, months)

<u>Initial</u>	<u>Functioning Age (months)</u>	<u>Current</u>	<u>Gain</u>
<u>10.0</u>	Motor	<u>12.0</u>	2.0
<u>12.7</u>	Perceptual Motor	<u>18.5</u>	5.9
<u>6.7</u>	Language	<u>21.9</u>	15.3
<u>15.5</u>	Cognitive	<u>25.5</u>	10.0
<u>12.0</u>	Self-Help	<u>21.3</u>	9.3
<u>12.5</u>	Social-Personal	<u>19.5</u>	7.1
11.5	AVERAGE FUNCTIONING AGE	19.8	8.3
<small>(Average functioning level at initial assessment)</small>		<small>(Average functioning level at assessment)</small>	



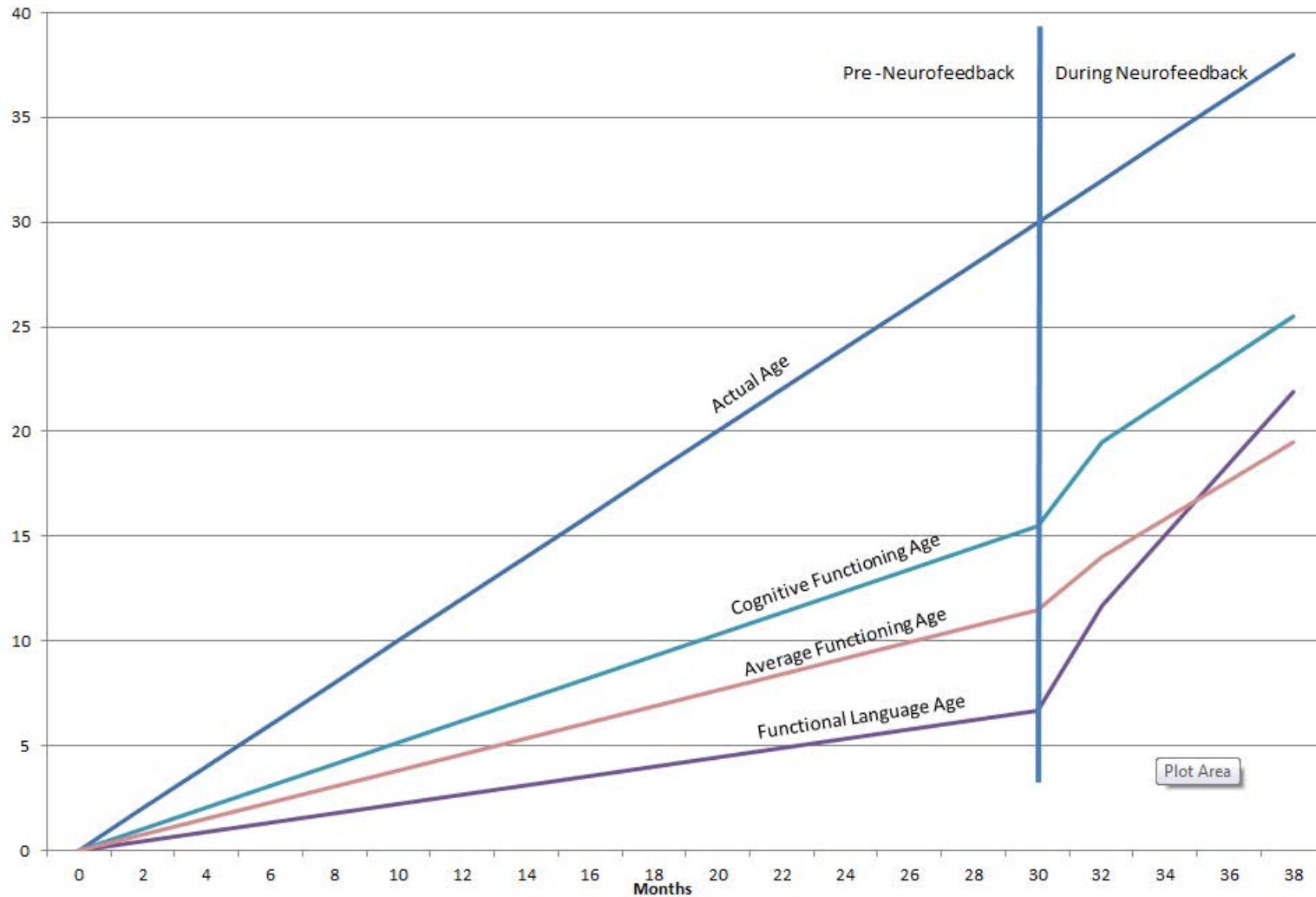
Total Progression in all areas of Development with NeurOptimal Training

Milestones Progress





Rate of Progression Prior to NO and After NO



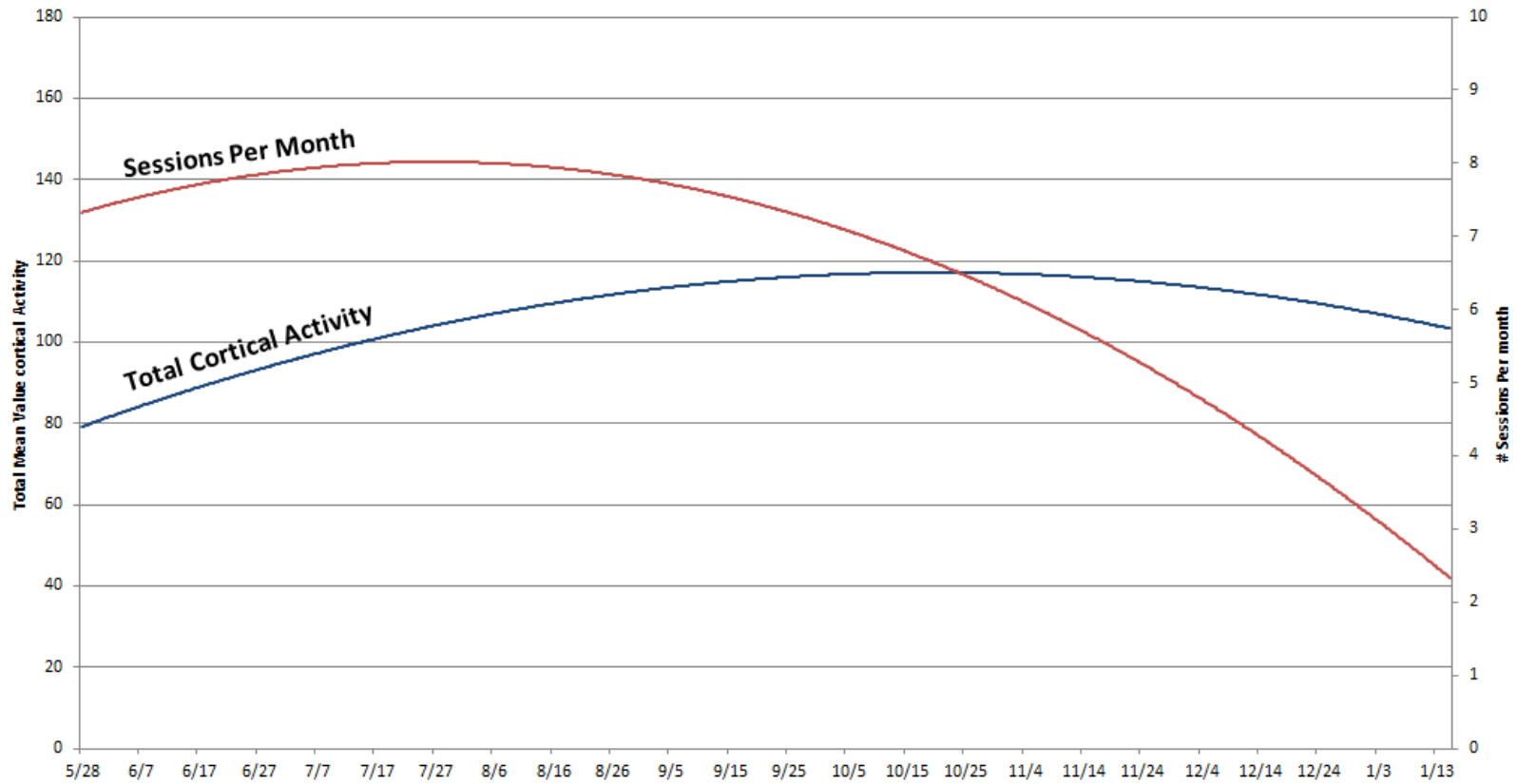


In 8 months time D
progressed an overall of
8.3 months



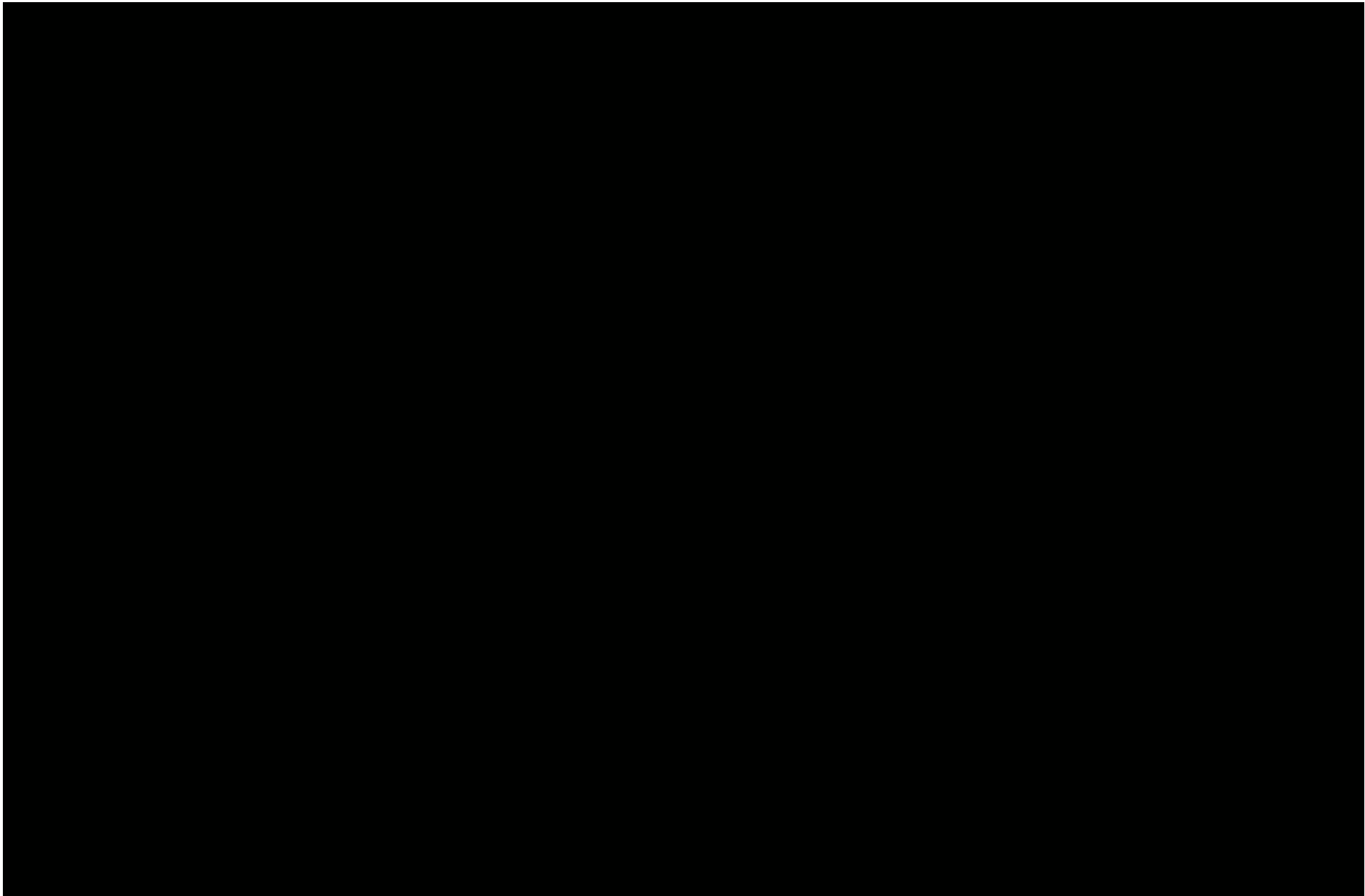
Correlation Between NO Session and Developmental Progression

D. Sessions per Month / Total Left and Right Mean Cortical Activity (μv) during Baseline





The Story of Kristi & Grayson



Grayson: 10 Year Old, Male

Grayson's initial concerns:

- Adenoids out at age 4
- Continued breathing issues
- Food avoidance (would eat very little and only specific textures)
- High anxiety
- When reading, must constantly start over to understand text
- Short working memory
- Test anxiety
- Weight loss
- Hyper-sensitive → dogs barking, dry skin, clothing tags, etc...



Grayson's Pro's:

- Good grades
- Exceptionally good athlete
- High energy and very active (with purpose and intent)



Neurofeedback Protocols and Cognitive Rehabilitation

Name: Grays

Major Concerns:

Rehab Goals

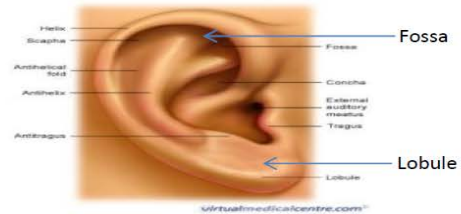
21	Language Disorders	Auditory Processing, Memory Skills, Executive Function, Attention Skills, Communication Skills
22	Learning Disorder	Visual Processing Skills, Motor-Planning Skills, Communication Skills, CNS Responses
17	Hypersensitivity	Memory Skills, Executive Function
6	Information Processing Problems	Auditory Processing, Executive Function, Attention Skills
24	Mild NeuroCognitive Disorder	Visual Processing Skills, Motor-Planning Skills, Communication Skills

Neurofeedback Focus: Auditory Processing and Listening Skills

Suggested Preliminary Protocol: 5, 5, 20,5

Montage:

Active Leads C3, C4, Reference Leads on Fossa, Ground Leads on Lobule

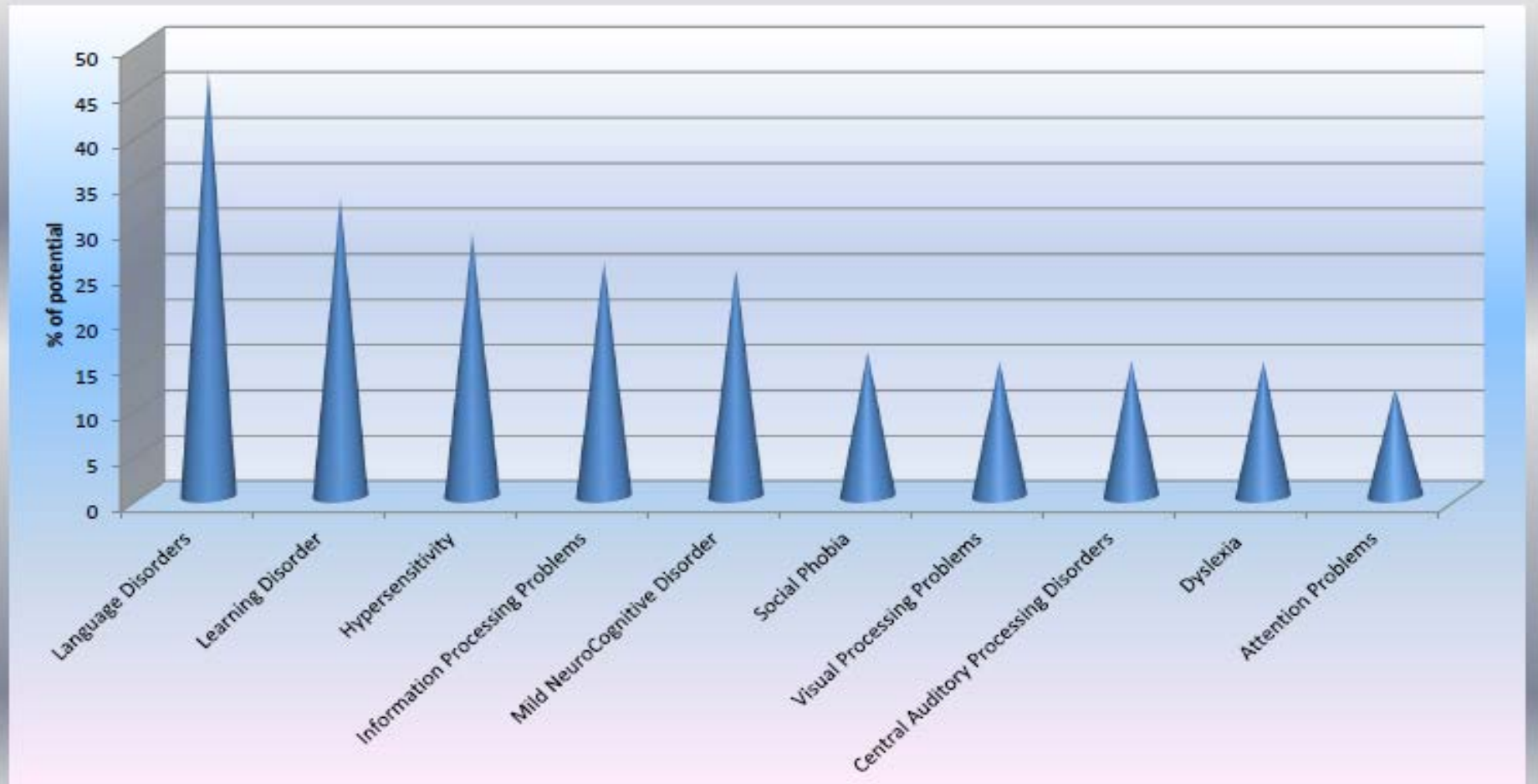


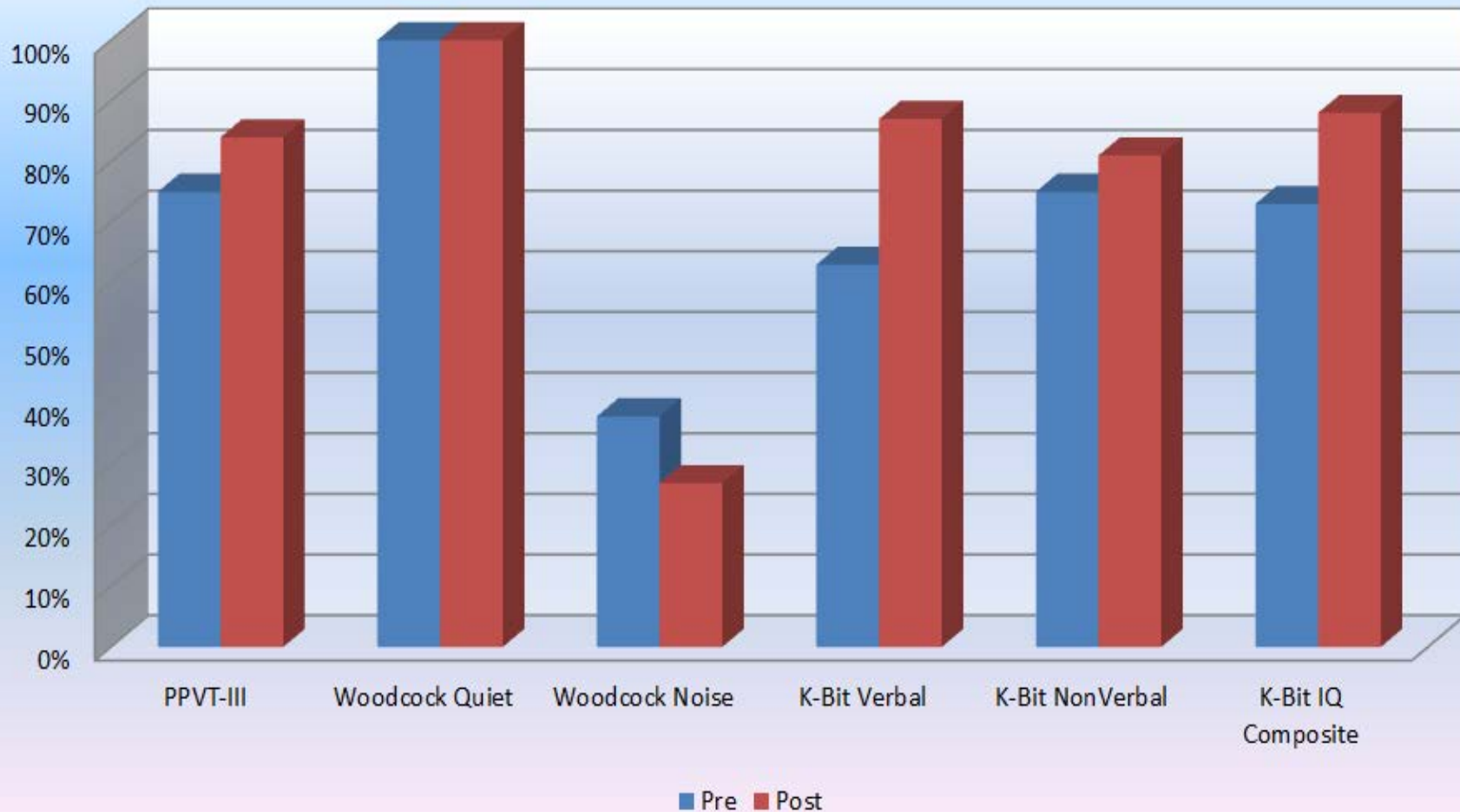
Cognitive Rehabilitation

Daily Protocol: Adult Earobics, SoundSmart - Advanced, Brainbuilder, Speed Reader, Thinkfast, Parrot Software - conditional Statements



400 Questions Top 10







Home Protocol:

Regular

Zen 1: 5 min
Zen 2: 7 min
Zen 3: 14 min
Zen 4: 7.3 min

Montage- standard NO hook-up

c3/c4 ipsilateral ear

Two to three times per week throughout the course.

NeuroOptimal® Stats



Client:
 Date:
 Time:



Portal:

Left Targets: C*r 0.986 CoV 68.2

	C*r	CoV	Min	Max	Range	Mean	Median	Mode	Moment	SD	Kurtosis	Skew
0 - 6 Hz Gabor	0.692	31.3	5.78	27.38	21.60	14.41	14.44	16.58	20.06	4.52	2.90	0.55
8 - 13 Hz Gabor	0.808	25.8	6.73	24.42	17.70	13.30	12.66	15.58	11.58	3.43	3.60	0.83
9 - 19 Hz Gabor	0.538	17.9	12.65	34.37	21.71	23.67	22.89	23.51	17.73	4.25	2.79	0.20
13 - 15 Hz Gabor	0.923	23.7	3.26	9.64	6.38	6.15	6.09	6.45	2.09	1.46	3.13	0.40
20 - 23 Hz Gabor	0.885	20.4	4.93	12.26	7.33	8.27	7.87	8.59	2.81	1.69	2.54	0.49
23 - 38 Hz Gabor	0.269	12.7	23.47	47.07	23.60	34.00	34.06	35.27	18.42	4.33	3.63	0.41
33 - 37 Hz Gabor	0.885	22.7	5.37	17.04	11.66	10.19	9.99	11.20	5.24	2.31	3.20	0.60
38 - 42 Hz Gabor	0.846	21.3	5.81	15.80	9.99	10.05	9.77	10.81	4.52	2.14	2.71	0.45

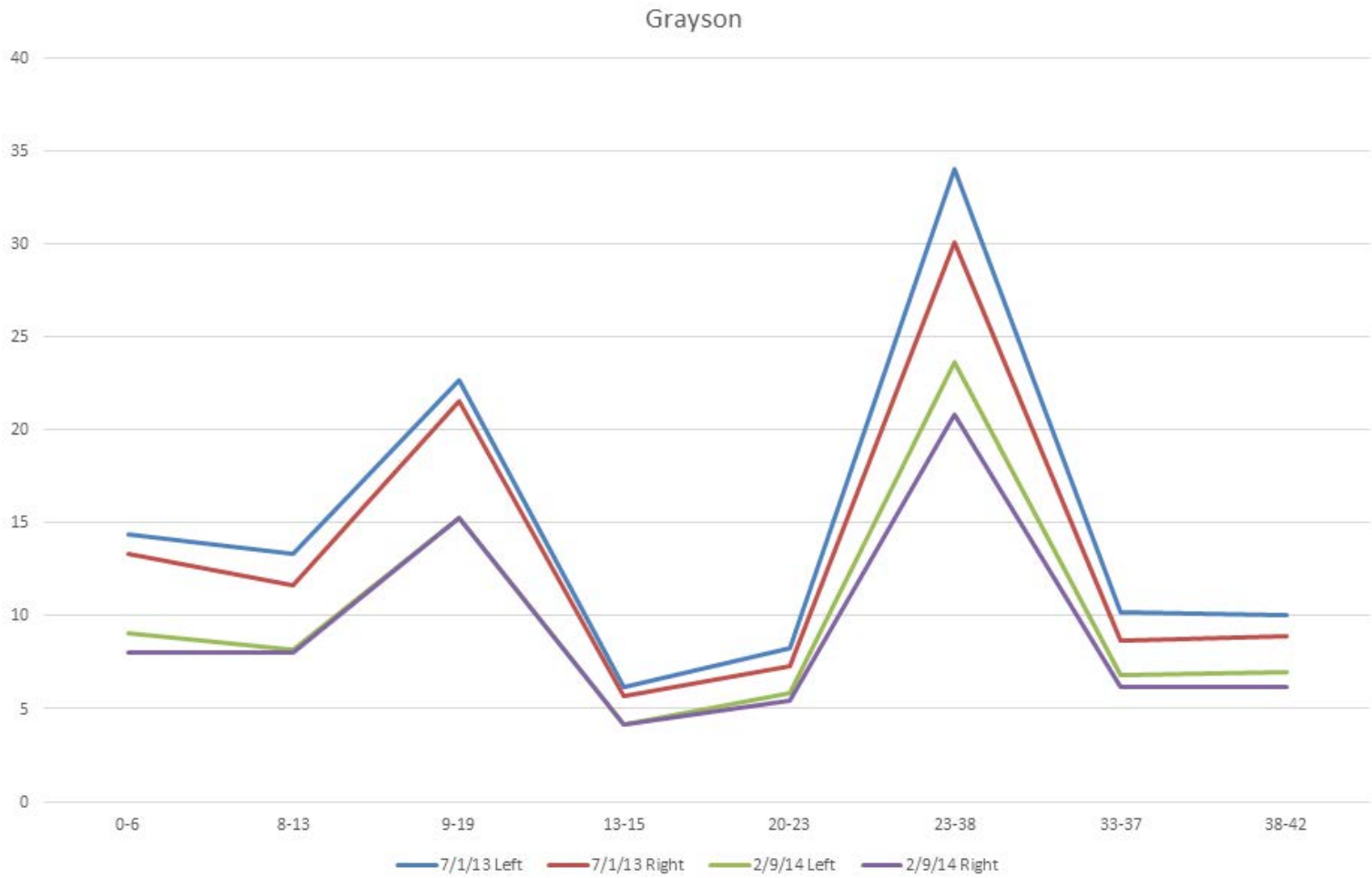
Right Targets: C*r 0.981 CoV 68.1

	C*r	CoV	Min	Max	Range	Mean	Median	Mode	Moment	SD	Kurtosis	Skew
0 - 6 Hz Gabor	0.615	41.6	4.77	34.96	30.19	13.34	12.44	19.87	30.34	5.55	5.19	1.11
8 - 13 Hz Gabor	0.808	24.3	7.05	21.19	14.14	11.65	11.29	14.12	7.86	2.83	4.38	0.98
9 - 19 Hz Gabor	0.692	16.0	13.23	29.49	16.26	21.59	21.07	21.36	11.68	3.45	2.61	0.14
13 - 15 Hz Gabor	1.000	19.4	3.51	7.94	4.43	5.66	5.69	5.72	1.18	1.10	2.26	0.15
20 - 23 Hz Gabor	1.000	20.7	4.55	11.43	6.88	7.30	7.13	7.99	2.25	1.51	3.33	0.55
23 - 38 Hz Gabor	0.269	14.7	18.55	41.14	22.59	30.10	30.32	29.84	19.12	4.41	3.16	0.16
33 - 37 Hz Gabor	0.846	21.3	4.79	14.37	9.58	8.63	8.37	9.58	3.32	1.84	3.84	0.85
38 - 42 Hz Gabor	0.923	19.6	5.43	14.54	9.11	8.87	8.77	9.99	2.96	1.74	4.93	1.00

Adaptive Denoising ▼

Default Scaling ▼

Date of Recording





Anecdotal Cases

At Cognitive Connections we believe:

- There are 2 main brain states we help a person achieve;
 - **Relaxed**- so they can sleep
 - **Alert**- so they can stay focused when needed
- We believe the brain needs an 'outside environment' to reinforce that brain state
 - When trying to achieve a relaxed state, lights out, laying back, **autogenics** before NO
 - When alert, we do **focused activities** that will create the external environment that assists with their personal cognitive concerns

Case #1

Hemiplegic Migraines

Female, 34 yr old

Symptoms of hemiplegic migraine include:

- Severe, throbbing pain, often on one side of your head
- A pins-and-needles feeling, often moving from your hand up your arm
- Numbness on one side of your body, which can include your arm, leg, and/or one side of your face
- Weakness or paralysis on one side of your body
- Loss of balance and coordination
- Visual aura, such as seeing zigzag lines, double vision, or blind spots
- Language difficulties, such as mixing words or trouble remembering a word
- Slurred speech
- Dizziness or vertigo
- Nausea and vomiting
- Extreme sensitivity to light, sound, and smell
- Confusion

Sessions 1-5

Reports feeling less stressed and a reduction in intensity, duration and frequency Migraines

Sessions 6-10

Reports all migraines seem to be gone, she is feeling great.

Sessions 11-15

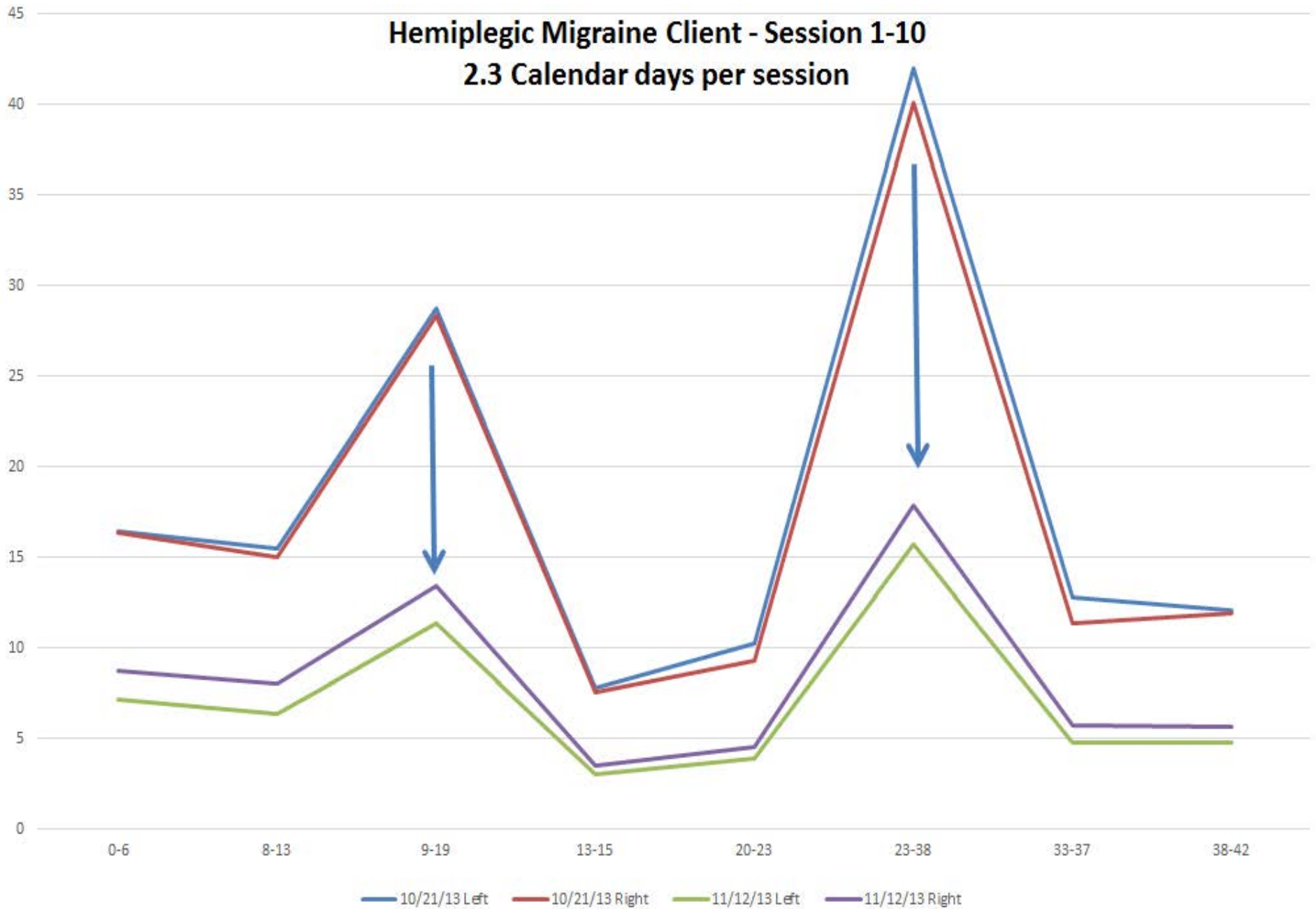
Decreased session frequency started to come less often, averaging every 16 days.

Then due to Holidays was unable to come in for 3 weeks-
Session #16 was experiencing an episode of paralysis of entire left side of body.

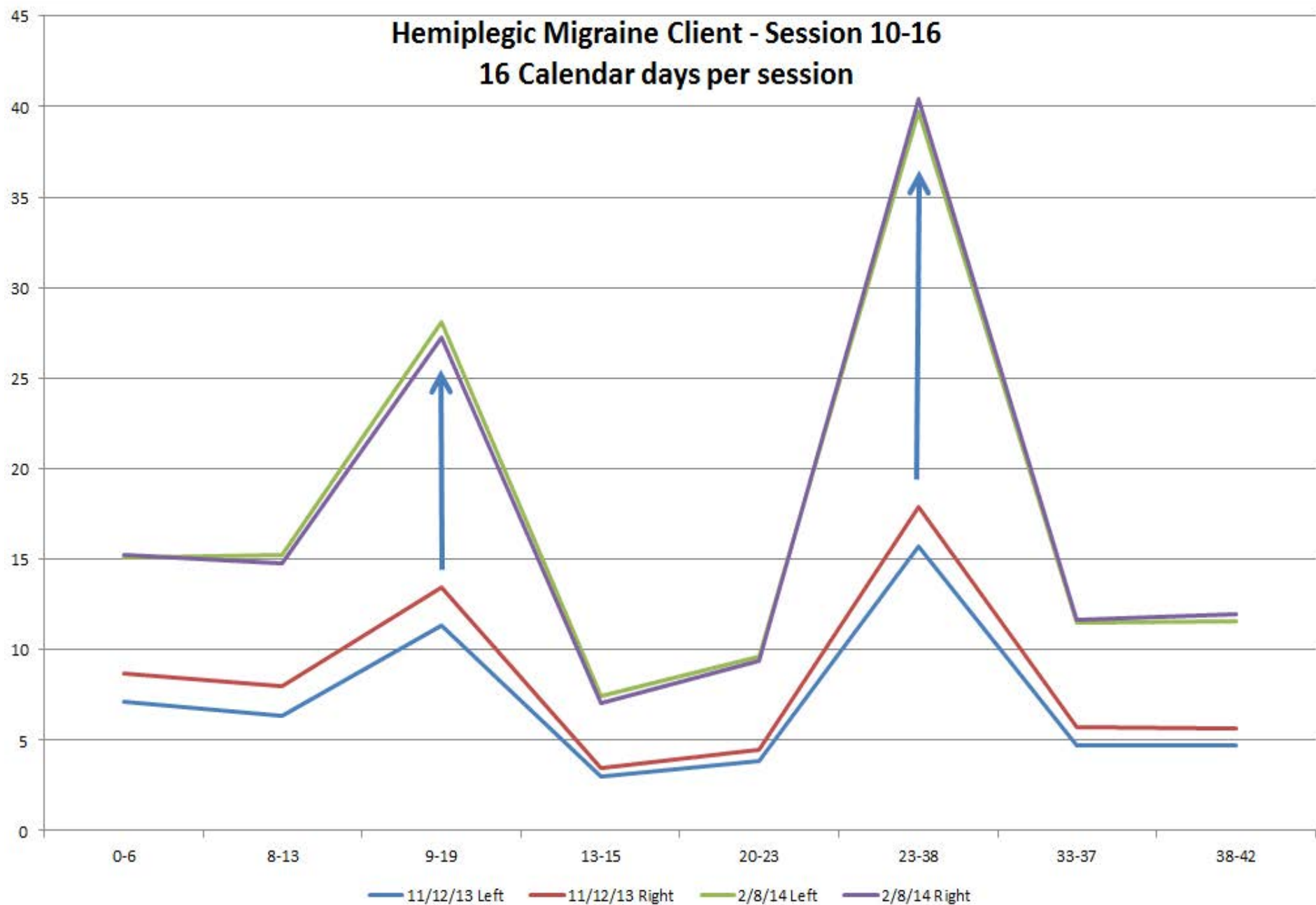
Session #16-

Left session with only tingling and no other symptoms, headache gone.

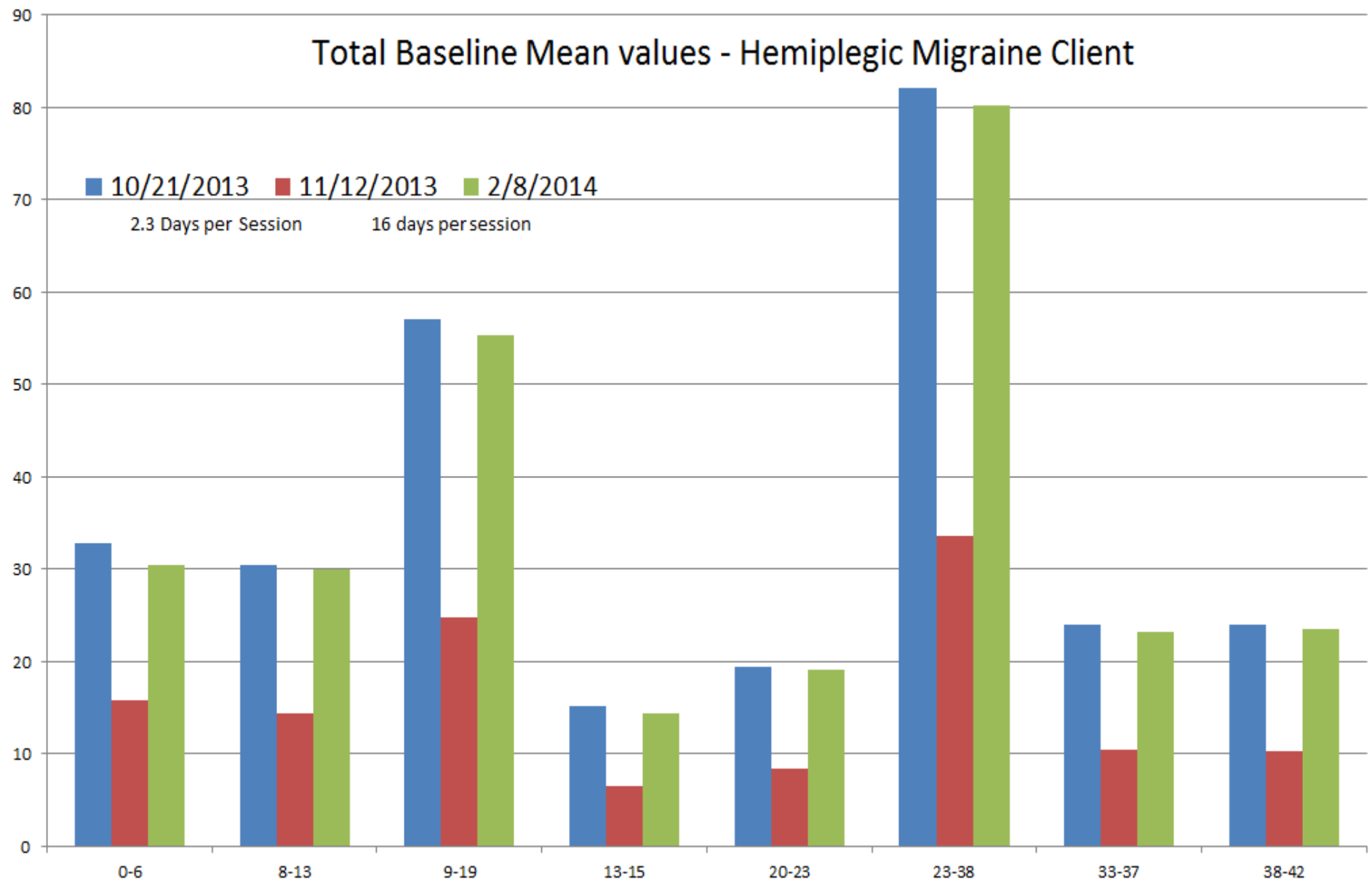
Hemiplegic Migraine Client - Session 1-10 2.3 Calendar days per session



Hemiplegic Migraine Client - Session 10-16 16 Calendar days per session



Total Baseline Mean values - Hemiplegic Migraine Client



Case #1

Cluster Migraines

Female 54 yrs old

Cluster Migraines:

Cluster headache is pain that occurs along one side of the head. It's frequently described as pain that occurs around, behind, or above the eye and along the temple in cyclic patterns or clusters. The pain of a cluster headache is very severe; many patients describe a “drilling” type of sensation.

Cluster attacks usually occur with **clocklike regularity** during a 24-hour day, and the cycle of cluster periods **often follows the seasons of the year**.

These patterns suggest that the **body's biological clock** is involved. In humans, the biological clock is located in the **hypothalamus**, which lies deep in the center of your brain.

Abnormalities of the hypothalamus may explain the timing and cyclical nature of cluster headache. Imaging studies have detected increased activity in the hypothalamus during the course of a cluster headache.

Protocol: Initial

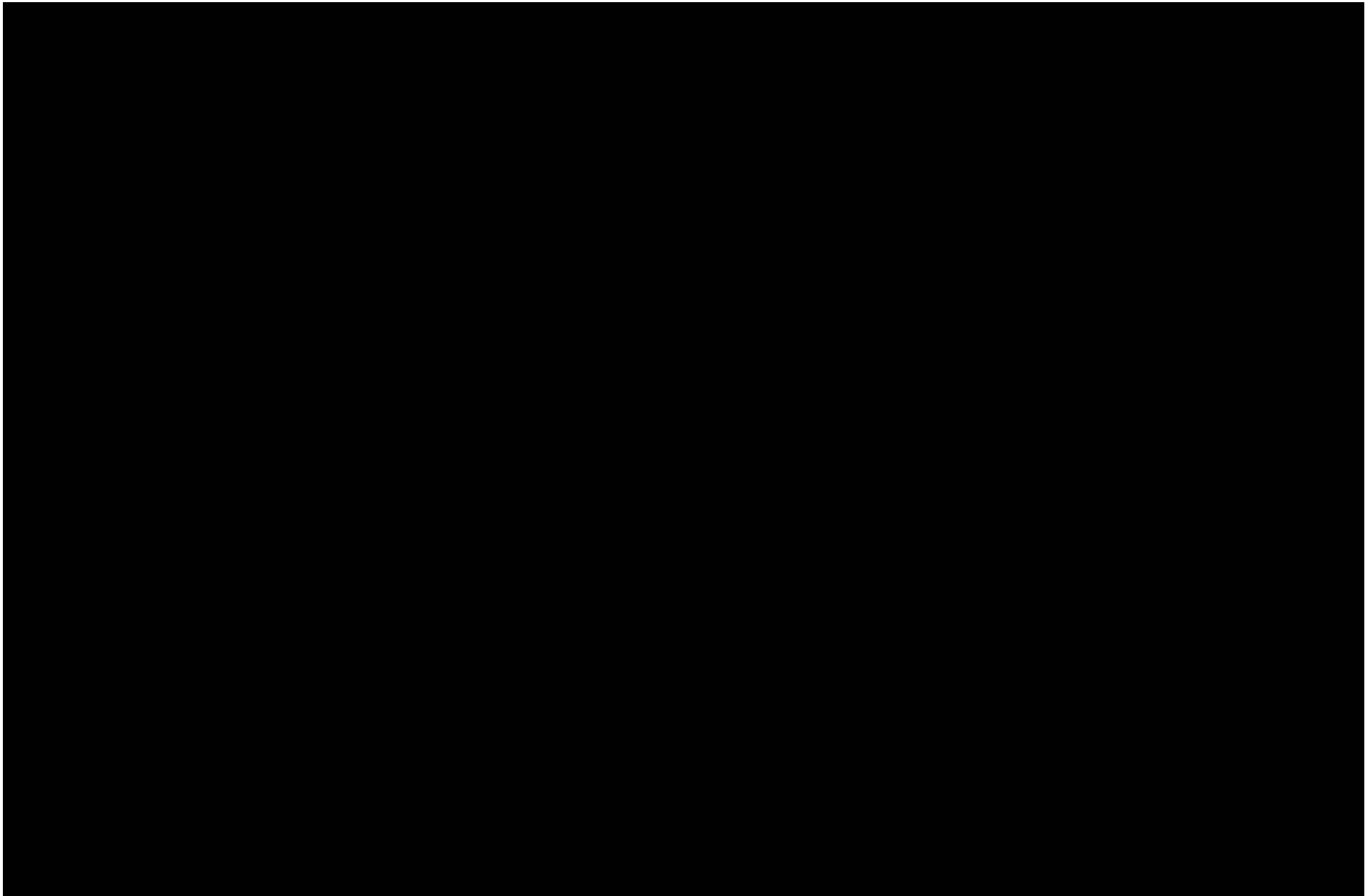
Session #1	Reported she felt very relaxed and more so than she remembers
Session #2-5	Reports much better sleep and the intensity, duration and frequency is much reduced.
Session #6-10	Reports no more migraines and the trigger of perfume, make-up and other odors are not bothering her.
Session #11-13	She has started wearing perfume for the first time in years, and has the energy to babysit her Grandson



The Case of Portia

A 4 year old with

Autism & Apraxia



Thank you Zengar

NeurOptimal has made a deep impression on many of the families we have had the honor to be a part of! We have maintained that there is not a system out there that is any more robust and consistent with their results.

When asked “will NO help everyone?” I have to say **Yes...** but the magic is in the unique way the results manifests’...

