Clinical Research
Something Old and Something New
Paul Harris, OD

OPSIS

Disclosure

I have no conflict of interest to declare.

For the Something Old: but I love what we do, and the results of this presentation should help get more people to do this wonderful thing we call VT.

For the Something New: I have always loved Jan Erik Haraldseth and his work with VisionBuilder and I want to see both the something old and the something new flourish.

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Something Old

- Well, it might be old (meaning done in the past) but this is the first time it is being reported on.

- From December 2009 till March of 2012, 69 consecutive VT patients in the practice of Elin Hansson, OD from Oslo, Norway agreed to participate in research. Vision Therapist Anja Paulus.
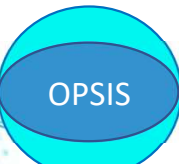
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Something Old

- Data included:
  - Complete analytical sequences
    - Before VT
    - 1 month after the completion of VT
  - A quality-of-life questionnaire
    - Before VT
    - 1 month after the completion of VT
   - 6 months+ after the prior visit

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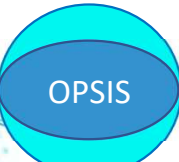
Demographics

- 69 total patients/subjects
- Age: average = 15.16 years : range: 6-78 : Standard Dev: 12.2 years
- Referred by:
  - Optometrist: 8
  - School/Education: 14
  - Hypnotherapist: 1
  - OT/PT: 2
  - Osteopath: 3
  - Other: 41

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Demographics

- Diagnostic Categories
  - Specific Learning and Reading Difficulties: 5
  - Apoplexy/Stroke: 1
  - Dyslexia: 3
  - Whiplash: 1
  - None: 34
  - Other: 25

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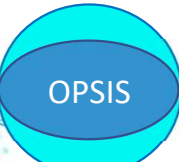
Treatment Used

- Vision therapy protocols learned during 30 days of post-graduate continuing education sponsored by the Kraskin-Skeffington Institute (KSI), hosted by the late Steen Saust in Copenhagen.

- This was done over ten 3-day weekends over an 18-month period.

- Elin and her therapist Anja, followed a custom protocol which was based on the equipment set they had at the time, but which followed primarily the VT1 or VT2 protocols, as assigned by Elin at the time of the initial examination.

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Length of VT

- Average length of VT: 5.8 months

- Minimum: 4 months

- Maximum: 11 months

- Standard Deviation: 1.6 months

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Changes in the actual data?

- Near Point of Convergence
  - Before
    - Average: 11.9 cm
    - Range: 0 cm (to the nose) to 60 cm (23.6 inches)
  - After
    - Average: 0.12 cm
    - Range: 0 cm to 5 cm (2 inches)
    - Mode: 0 cm (N=66)

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Things we didn't expect to change

Finding	Average	Minimum	Maximum	Std Deviation	p-values Cohen's *d*
Hab phoria Distance before	0.57 PD exo	6 PD eso	9 PD exo	2.5 PD	
Hab phoria Distance after	1.0 PD exo	4 PD eso	5.5 PD exo	1.7 PD	0.03 0.28 small
Distance phoria with subjective before	0.53 PD exo	12 PD eso	9 PD exo	2.4 PD	
Distance phoria with subjective after	0.97 PDD exo	2 PD eso	4 PD exo	1.4 PD	0.07 0.23 non-significant
Near phoria before (13)	3.4 PD exo	15 PD eso	20 PD exo	6.1 PD	
Near phoria after (13)	3.4 PD exo	16 PD eso	18 PD exo	6.0 PD	0.91 0.01 non-significant

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Things we expected to change

Finding	Average	Minimum	Maximum	Std Deviation	p-values Cohen's *d*
D - BO Break Before	26.7 PD	-4 PD	40 PD	10.9	
D - BO Break After	37.1 PD	20 PD	40 PD	5.4	<0.001 0.86 Large
D- BI Break Before	9.1 PD	2 PD	20 PD	3.1	
D - BI Break After	10.6 PD	6 PD	15 PD	2.2	0.001 0.41 Medium
N - BO Break Before	27.3 PD	-10 PD	40 PD	10.7	
N - BO Break After	38.2 PD	18 PD	40 PD	4.9	<0.001 1.0 Large
N- BI Break Before	19.0 PD	6 PD	30 PD	4.5	
N - BI Break After	22.7 PD	14 PD	30 PD	3.1	<0.001 0.67 Medium

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More things we expected to change

Finding	Average	Minimum	Maximum	Std Deviation	p-values Cohen's *d*
PRA Before	-0.78 D	1.50	-7.00	1.5 D	
PRA After	-1.89 D	0.25	-5.00	1.1 D	<0.001 0.69 Medium
NRA Before	2.10 D	0.50	3.00	0.57 D	
NRA After	2.68 D	0.75	3.25	0.61 D	<0.001 0.97 Large

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Quality of Life – 25-Item Questionnaire

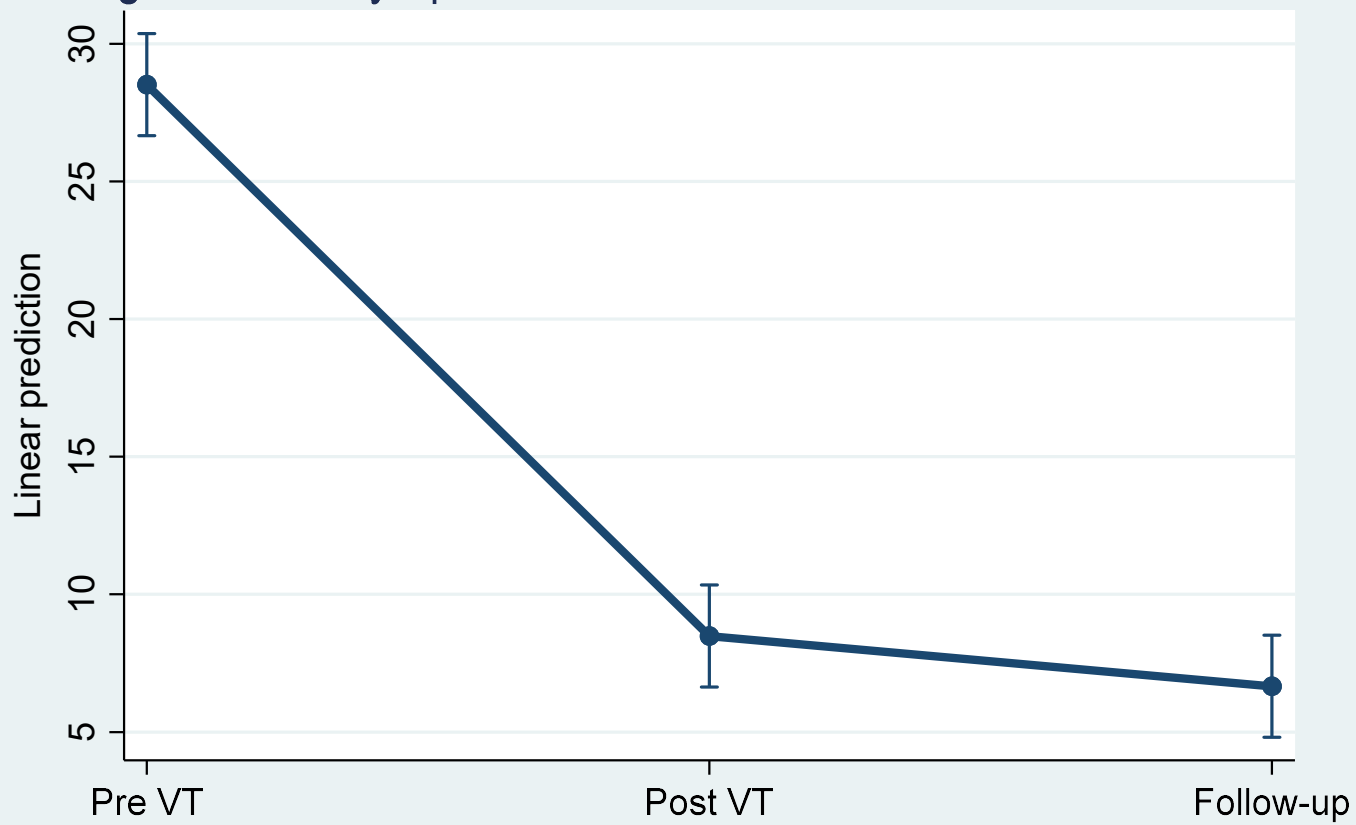| Number	Question	Number	Question
1	Headache	14	Keeps reading material close to eyes
2	Extreme fatigue	15	Tilts head when reading / writing
3	Blinking with eyes	16	Moves head when reading
4	Rubbing the eyes	17	Problems copying geometric shapes
5	Strongly fluctuating mood	18	Poblems writing / drawing on limited areas
6	Sees blurry at distance	19	Mixing letters and words
7	Sees blurry at near	20	Losing or re-reading words / lines
8	Double vision at distance	21	Using finger / ruler as marker when reading
9	Double vision at near	22	Reading slowly
10	Pain at bright light	23	Poor reading comprehension
11	Problems throwing and catching a ball	24	Tired easily / easy to distract
12	Clumsy	25	Dizziness
13	Keeps one eye closed when reading		

4-point Likert Scale to respond from 0-3.

0 = never
3 = always

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So, were there changes in the QOL?

You bet!!!

	Average	Minimum	Maximum	Std Dev	p-value Cohen's *d*
Before VT	28.5	9	59	10.7	
1 month after the completion of VT	8.5	0	24	5.4	<0.001 1.95
6 months after that	7.0	0	32	6.9	<0.001 2.07

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Change in Total Symptom Scores with 95% Confidence Intervals

Equilibrium Findings
Some Open Questions

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Query for the group

- What amount of difference in your equilibrium (vergence) finding(s) would you consider clinically significant?

- Online: please put your numbers in the comments. If you don't want them to be seen publicly, then send them to me, Paul Harris only.

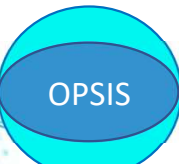- In the room: everyone please write it down on a sheet of paper going around the room.

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Some History

My father would do what he called an Index. He would bring the patients to the "VT" room and they would sit down at the "prism reader" also called the "prison reader" by some. He would have his staff run these numbers. This way the tester was blinded to his other set of numbers (from the analytical).

Background

- He compared the numbers from the analytical (static) vs. under load (prism reader).

- With the prism reader they were reading out loud and would also report break and recovery as the staff person went from base out to base in and back.

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Other things to look at while we are at it!

- Which direction to go first, Base Out or Base In?
    - Skeffington Analytical Sequence – Base Out first
    - Nearly every optometry school on the planet – Base In first
- The elephant in the room:
    - Everyone knows it:
        - Prism adaptation
            - Faster and larger for Base Out prism – whatever you do after will be affected.
            - Slower and smaller for Base In prisms – less effects on what comes immediately after

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So, we have 6 conditions

1. Phoropter Risley Distance Base Out First
2. Phoropter Risley Distance Base In First
3. Phoropter Risley Near Base Out First
4. Phoropter Risley Near Base In First
5. VisionBuilder Base Out First
6. VisionBuilder Base In First

Order for each subject was randomized

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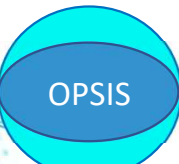
How fast to move the prisms?

- Topic of poster for COVD 2013.

- Data collected from 15 participants of the CCVC 2012.

- Video of the phoropter during testing.

- Participants were told we wanted to get the sequence and instructional sets from right after the "refraction" till the phoropter were pulled away.

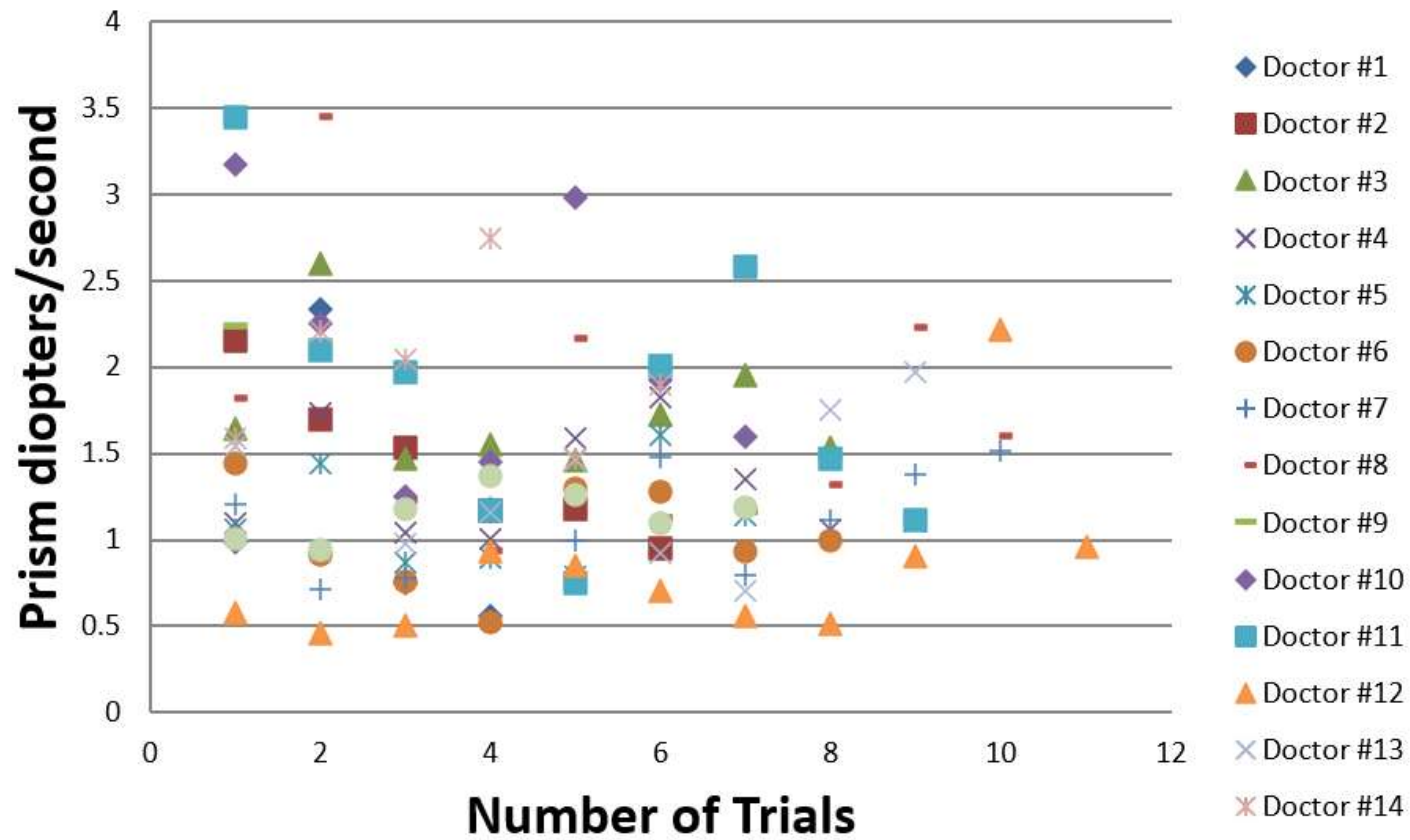- Thanks to Cade Kowalis, OD (SCO 2014) for doing this work and analyzing the recordings.

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Average Speed of Prism Movement (per eye)
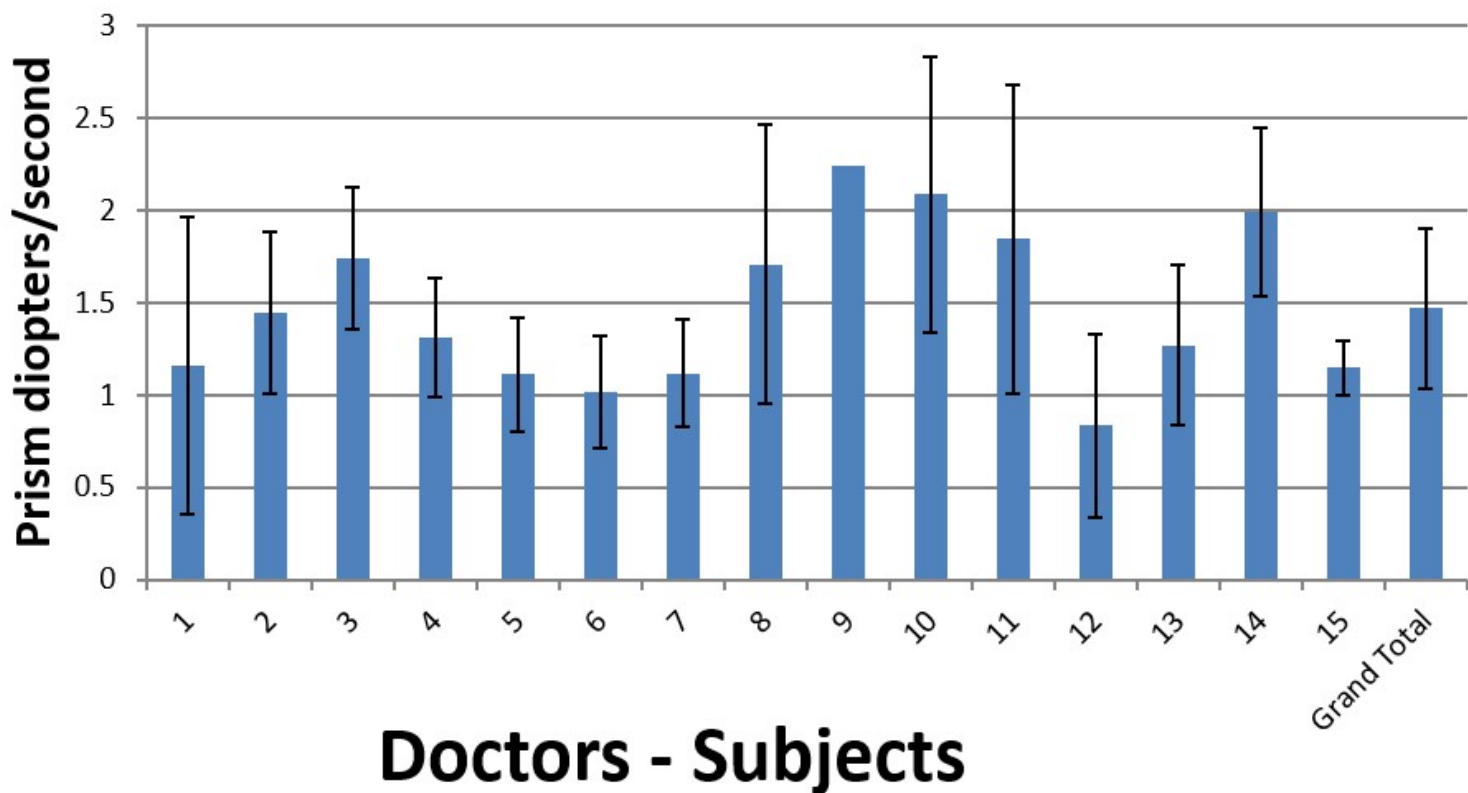
How fast did they go?

Average:
1.5 PD/eye/second
or
3 PD / second

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But… Lots of variability here and repeats galore.

Preliminary Data from 51 subjects

Distance Phoropter Risley (Prism Diopters / PD)

Finding	BO First	BI First	Net Difference (First – Second)
Base Out Break	22.48	20.18	2.3
Base Out Recovery	9.38	7.22	2.16
Base In Break	11.24	12.74	1.5
Base In Recovery	3.58	4.88	1.3

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Preliminary Data from 51 subjects

Near Phoropter Risley (Prism Diopters / PD)

Finding	BO First	BI First	Net Difference (First – Second)
Base Out Break	29.64	27.16	2.48
Base Out Recovery	16.78	13.24	3.54
Base In Break	23.00	23.90	0.90
Base In Recovery	8.46	9.62	1.16

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VisionBuilder Vergences
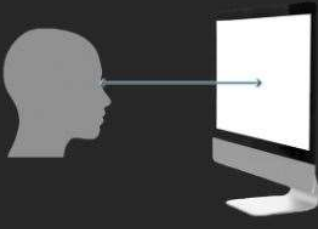
VB Instructions

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Standard

BO br: 0 BO rec: 0 BI br: 0 BI rec: 0

Press Spacebar to start, and for Break and Recovery values

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Dynamic with Reading Demand
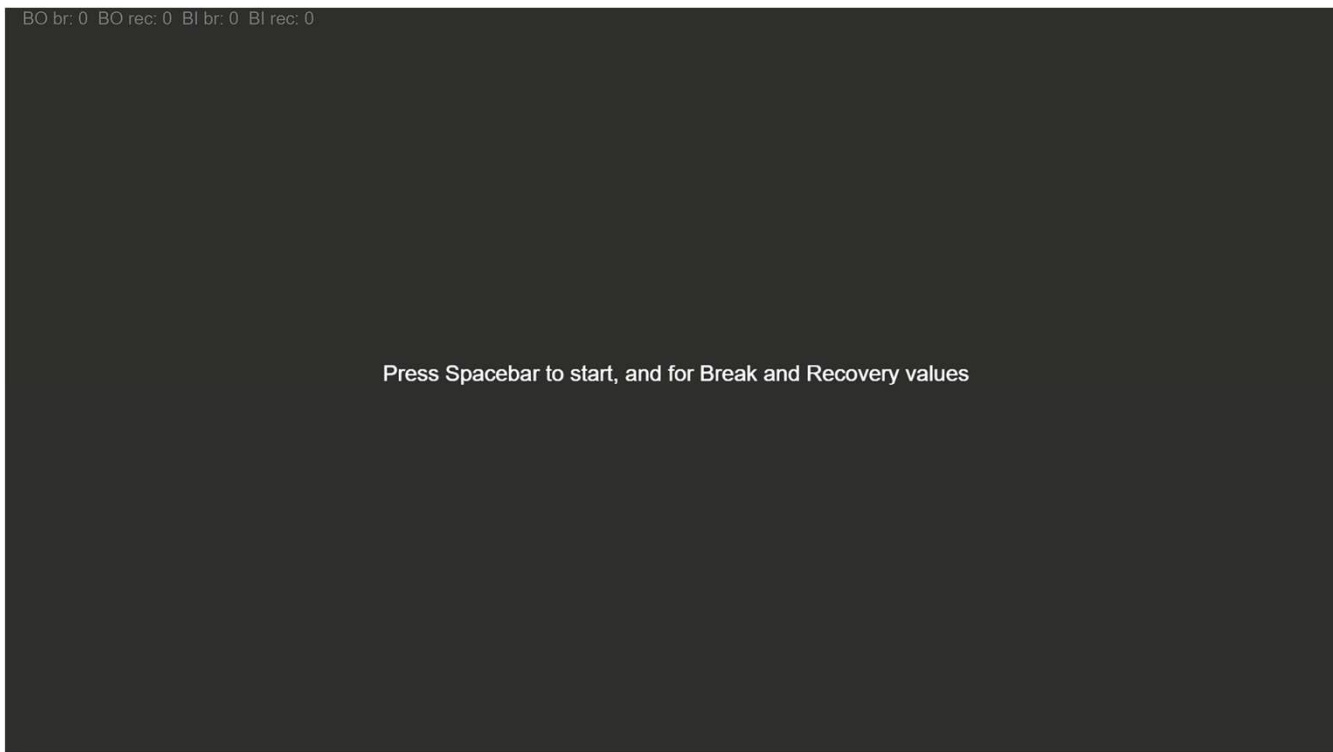
Results - Current

Test results

Static vergence
Base Out break / recovery: 22.0 / 13.0
Base In break / recovery: 12.0 / 6.0

Dynamic vergence
Base Out break / recovery: 27.0 / 19.0
Base In break / recovery: 22.5 / 13.0

Continue   Restart part 2

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Results - Stored

DYNAMIC VERGENCE

Paul 001
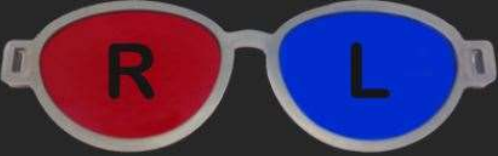
	Static vergence		Dynamic vergence	
Date	Base Out	Base In	Base Out	Base In
12/4/2022	22.0 / 13.0	12.0 / 6.0	27.0 / 19.0	22.5 / 13.0
9/11/2022	11.5 / 6.0	9.5 / 6.5	18.0 / 14.5	9.5 / 6.5
6/13/2022	57.0 / 57.5	11.0 / -2.0	141.0 / 102.0	18.5 / 12.5
6/6/2022	71.0 / 68.5	8.5 / 1.0	49.0 / 39.5	8.0 / 4.0
6/6/2022	8.0 / 8.0	8.5 / 2.0	30.0 / 20.0	11.0 / 3.5
6/6/2022	11.5 / 11.0	4.5 / 1.5	58.0 / 55.0	8.5 / 6.0

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Preliminary Data from 51 subjects

VisionBuilder (Prism Diopters / PD)

Static Chart

Finding	BO First	BI First	Net Difference (First – Second)
Base Out Break	21.99	24.5	-2.51
Base Out Recovery	9.51	11.71	-2.20
Base In Break	10.39	9.42	-0.97
Base In Recovery	2.72	2.43	-0.29

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Preliminary Data from 51 subjects

VisionBuilder Static Compared to Phoropter Distance

Finding	BO First	BI First	VB BO First	VB BI First
Base Out Break	22.48	20.18	21.99	24.5
Base Out Recovery	9.38	7.22	9.51	11.71
Base In Break	11.24	12.74	10.39	9.42
Base In Recovery	3.58	4.88	2.72	2.43

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Preliminary Data from 51 subjects

VisionBuilder (Prism Diopters / PD)
Dynamic with Reading

Finding	BO First	BI First	Net Difference (First – Second)
Base Out Break	36.64	34.97	+1.67
Base Out Recovery	15.98	14.56	+1.42
Base In Break	16.32	16.48	+0.16
Base In Recovery	4.42	5.08	+0.66

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Some play with ratios

Finding	BO Recovery/Break	BI Recovery/Break
Phoropter BO First Distance	42	32
Phoropter BI First Distance	36	38
Phoropter BO First Near	57	37
Phoropter BI First Near	49	40
VisionBuilder BO First Chart	43	26
VisionBuilder BI First Chart	48	26
VisionBuilder BO First Reading	44	27
VisionBuilder BI First Reading	42	31

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Future

- Should we remove or make smaller the box around the reading portion? That should make all the numbers smaller, or should we leave it as is and begin to look at the upper and lower performers to see what might be in the relative changes?

- Based on the numbers you have given me in terms of "clinical significant" we will decide on more subjects vs. its time to publish.

So… Thank you.

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Thank You to:

- Jeffrey Kraskin
- Elin Hansson and Anja Paulus
- Jan Erik Haraldseth

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