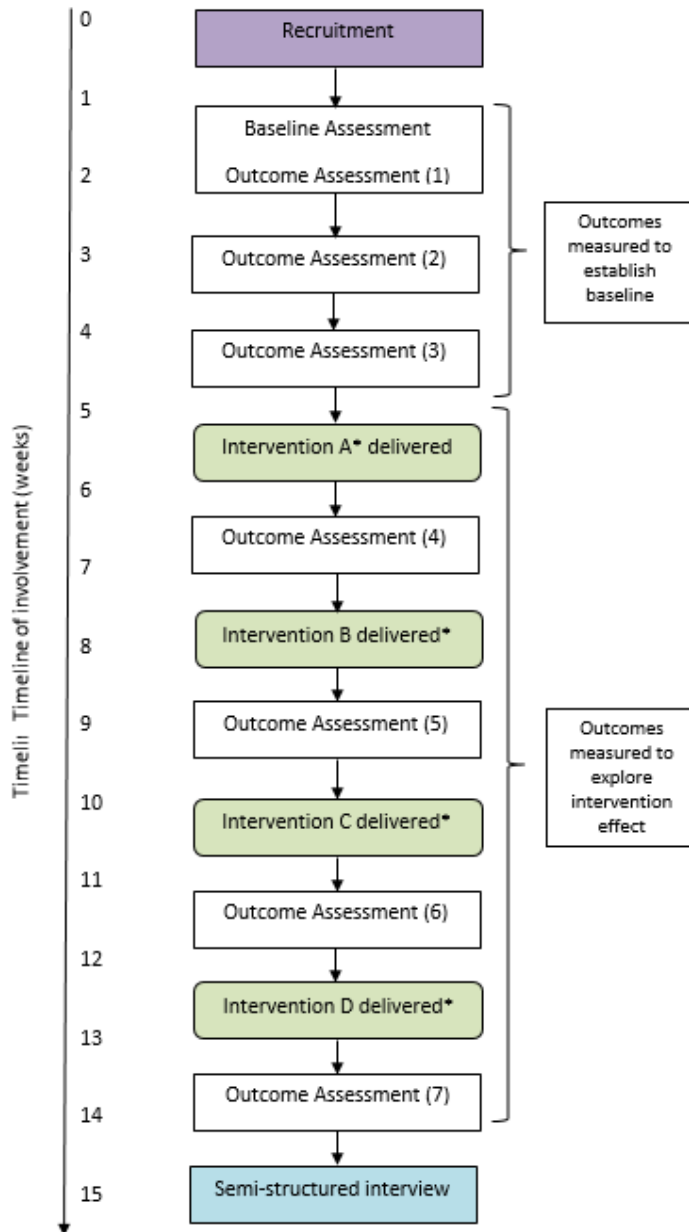# SUPPLEMENTARY MATERIAL

Supplementary Material 1 Flowchart of participant study activities

Key

* order of intervention delivery was randomised, using www.random.org

Baseline assessment comprised: personal details, medical history, ocular history, stroke severity rating, visual acuity, visual field loss, visual neglect

Outcome Assessment comprised: activities of daily living (Stelmack et al., 2004), quality of life(Lamoreaux et al., 2008), visual search ability (Treisman and Gelade, 1980), reading speed (Trauzettel-Klosinski et al., 2012)

Supplementary Material 2 – Full Intervention Description (using TIDieR guidelines)

1. Brief name	MyHappyNeuron	NVT Light Box	Rainbow Readers	VISIOcoach
2. Why	To train cognitive strategies and techniques in those with visual processing problems.	"to teach a pattern of systematic visual search strategies from the perimeter of the affected visual field to the intact visual field". The aim is to transfer these to ADL and mobility.	To improve visuo-perceptual skills (tracking, visual discrimination, visual spatial skills and left-right reversals) and visuo-motor skills.	To achieve better use of the total field of gaze by training better explorative eye movements towards the blind visual field, in order to give better orientation, mobility and independence.
3. What: materials	Online 'brain training', accessed via paid subscription.

Access: happy-neuron.com | This specialist equipment, or 'light box' is made up of 2 rows of equally spaced, coloured lights stretching over 1.5m horizontally. It is controlled via an attached laptop.

Access: via Rehabilitation Officers | Rainbow Readers consists of a booklet, plus exercises that can be printed off from a computer file. Exercises in the former consist of symbols only, the latter contains letters, numbers and pictures.

Access: nadia.northway@gcu.ac.uk | Training is provided by a computer program installed from a USB drive.

Access: visiocoach.de/ |
| 4. What: procedures | The site allows access in two ways: a free basic site and a subscription site that provides guidance on the difficulty level to use. It consists of a large number of brightly coloured, highly interactive games, for example: word search, remembering and tracing paths, general knowledge quizzes and logic puzzles. Exercises are explained in full using onscreen instructions, once they are competed (using the mouse or | The light box is used in 5 different exercises where the lights must be found and/ or identified: these are used to assess an individual's vision and then train the visual field. By verbal instructions, the rehabilitation officer encourages the user to make large scanning movements of the eye and head, to reach the lights at the very end of the light box. They are typically instructed to move from the non-seeing to seeing side of the visual field. The light box is the first "static" stage in a larger rehabilitation programme for visual | Exercises are primarily search tasks and include searching for a symbol or number within a line of varied symbols and numbers, scanning between letters on opposite sides of a page and identifying specific items in picture displays: exercises increase in difficulty. There is no time limit and the response required in most exercises is to circle the correct answer: any incorrect answers mean the user should start the line again and therefore requires support throughout to point out any | The point of each exercise is to find a number using eye movements (not head movements) and mark with a mouse. The number to be found is shown in a large font in the centre of the first screen. On the second screen, number is repeated and hidden in an irregular pattern of other numbers on a white background. There are three difficulty levels: in each session a user should stay at the same level, and progress to a higher level at the next session. |

		keyboard) scores and tips for better performance are given. The level of difficulty is quite high and progresses in relation to a user's progress.	field loss that moves on to "dynamic" training, where these broad eye and head movements are practiced in real life environments and tasks.	mistakes. Support can come from a carer and the booklet can be used at home	
5.	Who Provided	Demonstrated by researcher (Optometrist). Home use could be supported by family/carer.	By trained Low Vision Rehabilitation Officer	Demonstrated by researcher (Optometrist). Home use could be supported by family/carer	Demonstrated by researcher (Optometrist). Home use could be supported by family/carer
6.	How	Computer-online	Face-to-face	Paper-based	Computer-program
7.	Where	In participant's home	In participant's home	In participant's home	In participant's home
8.	When and how much	Recommended schedule: 8 x 35 min sessions, over 2 weeks	Recommended schedule: 8 x 45 min sessions, over 5 weeks	Recommended schedule: 12 x 10 min sessions, over 2 weeks	Recommended schedule: 2 x 30 min sessions per day, 5 days per week, for 2 weeks
9.	Tailoring	Exercise difficulty increased automatically if the participant was able to complete initial, easier stages.	Tailored by provider to abilities of the participant	Participant could choose the difficulty level of the page they started on: difficulty level increases through the booklet.	Participant could choose one of three difficulty levels (low/medium/high) to use for a session
10.	Modifications	None	None	None	None

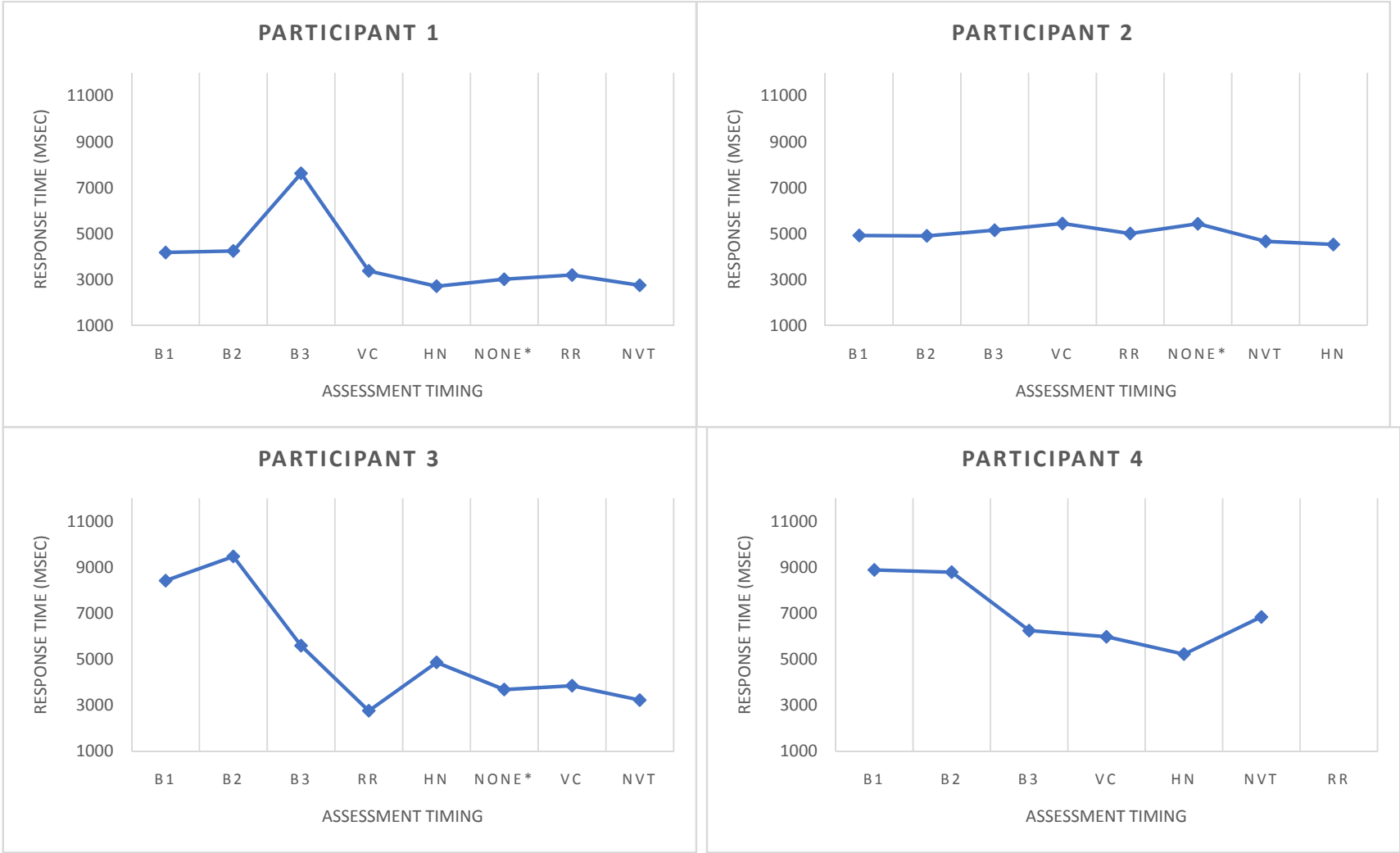## Supplementary Material 3: Interview Topic Guide

4What did you think of these weeks of rehabilitation/research?

- If you were offered something like scanning training, do you think it was something you would take up?

- Which interventions
    - have had the most effect / impact on you?
        - What have they had an impact on?
        - How have you been aware of this?
        - How did they make this impact?
    - have been the best to use?   Why?
    - have been the worst to use?   Why?
    - would you like to use after the study ends, or recommend to others?
- Do you think it would be good to combine specific training methods?
    - Which? Why? In what order? Who for?
- Is there anything else you would like to tell me, either about having taken part in this research or the scanning training, that we haven't covered already?
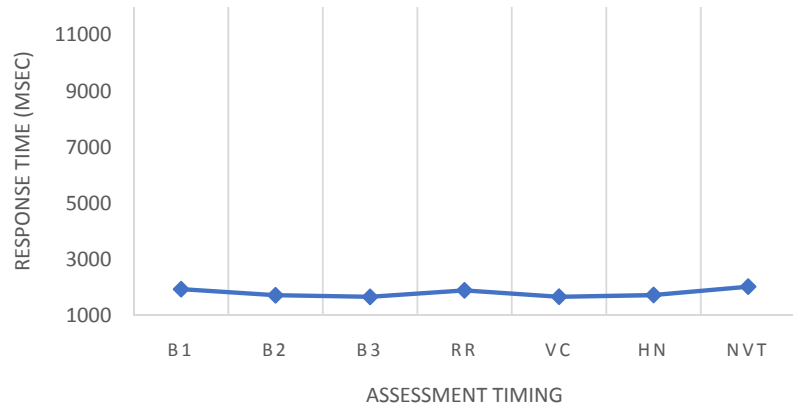

Supplementary Material 4: Analysis categories developed

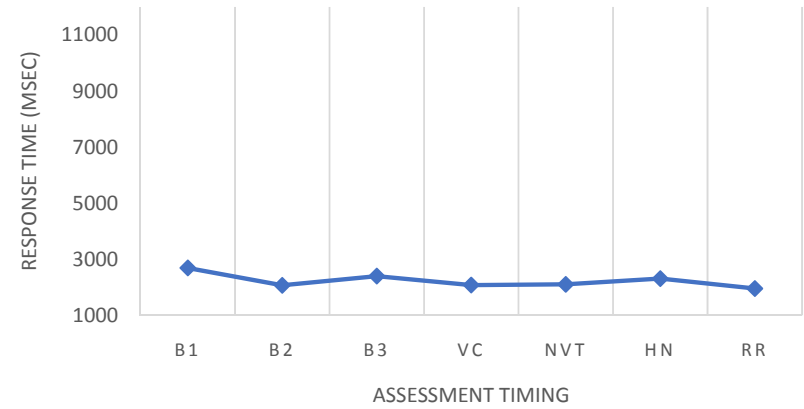|	Framework categories
Intervention effect	1. Overall Effect 2. Specific effects 3. Mechanism of effect 4. Factors associated with training effect
Intervention feasibility	5. Overall feasibility 6. Can they do it? Are they able to do it? 7. Do they (choose to) do it? Enjoyment / Engagement 8. Other feasibility issues
The study	9. Perspectives of the study

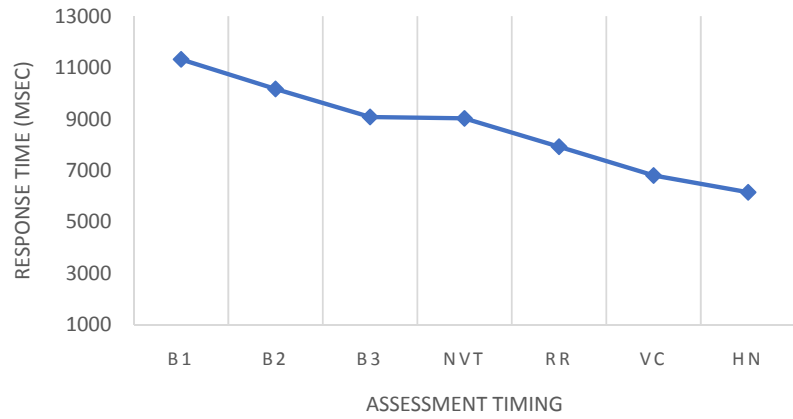## Supplementary Material 5: Line plots for Visual Search Test
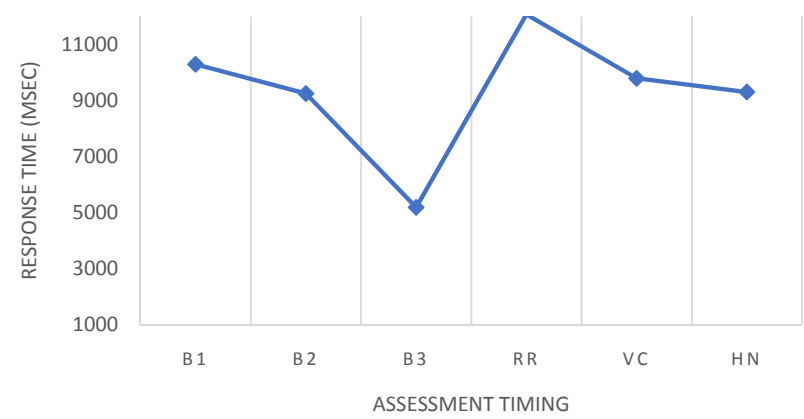

PARTICIPANT 1

Y-axis: RESPONSE TIME (MSEC)
X-axis: ASSESSMENT TIMING — B1, B2, B3, VC, HN, NONE*, RR, NVT

PARTICIPANT 2

Y-axis: RESPONSE TIME (MSEC)
X-axis: ASSESSMENT TIMING — B1, B2, B3, VC, RR, NONE*, NVT, HN

PARTICIPANT 3

Y-axis: RESPONSE TIME (MSEC)
X-axis: ASSESSMENT TIMING — B1, B2, B3, RR, HN, NONE*, VC, NVT

PARTICIPANT 4

Y-axis: RESPONSE TIME (MSEC)
X-axis: ASSESSMENT TIMING — B1, B2, B3, VC, HN, NVT, RR

PARTICIPANT 5

Response time (msec) vs Assessment timing (B1, B2, B3, RR, VC, HN, NVT)

PARTICIPANT 7

Response time (msec) vs Assessment timing (B1, B2, B3, VC, NVT, HN, RR)

PARTICIPANT 9

Response time (msec) vs Assessment timing (B1, B2, B3, NVT, RR, VC, HN)

PARTICIPANT 11

Response time (msec) vs Assessment timing (B1, B2, B3, RR, VC, HN)

PARTICIPANT 12

Key - Assessment timing

B= Baseline

HN= after MyHappyNeuron use

None* = no intervention used (over 2-week Christmas period)

NVT = after NVT use

RR = after Rainbow Readers use

VC = after VISIOcoach used

Supplementary Material 6: Participants' reports of perceived effects of use the four scanning training tools

Intervention	Visual Skills	Cognitive skills	Tasks and activities	Emotions
MyHappy-Neuron	• Perception of detail • *Tired eyes*	• "stretching brain"	• Using computer	• Achievement • Confidence • Motivation • Enjoyment • Patience • *Stupidity/blame* • *Disappointment* • *Anger* • *Anxiety*
NVT	• "use of vision" • Visual scanning (scanning pattern, width, awareness of need to, use of head and eyes)	• Concentration • Reaction speed • Memory • Awareness of affected side	• Walking outside (safely, confidently) • Seeing people • Getting public transport	• Achievement • Confidence (self, in activities) • Motivation • Feel supported • Hope
Rainbow Readers	• Visual scanning (left to right) • Perception of detail • *Tiring* • *headaches*	• Concentration • Memory • Processing (agility)	• Reading	• Achievement • Satisfaction • Progression
VISIOcoach	• Scanning (wider, quicker, with own pattern) • Better search • Perception of detail • *Tiring*	• "mental stimulation" • Processing	• Using computer (email, games) • Internet • Reading	• Achievement • Confidence (self, in scanning) • Independence • Motivation • Attitude (optimism) • Patience • *Anger/frustration* • *Stupid* • *Demotivated*

Key

Negative effects are given in italic type