

Administering the ScanCourse: Standardized Instructions, Materials, and Research Findings

Paige Lund, MOT student; Caitlyn Moir, MOT student; Dr. Ben Mortenson, PhD, OT &
Lisa Kristalovich, MRSc, OT

UBC Master of Occupational Therapy Knowledge Translation



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This manual is the product of research completed as part of the UBC Master of Occupational Therapy program. In this study, researchers examined the psychometric properties of the ScanCourse, a visual scanning assessment used by occupational therapists in various settings. This was achieved with the help of occupational therapists at GF Strong Rehabilitation Center, Lions Gate Hospital and Holy Family Hospital. The purpose of this manual is to provide occupational therapist with the standardized administration instructions and recording forms used in this study. This study found that the ScanCourse had strong psychometric properties when using these standardized procedures were used. These results are discussed further at the end of the manual.

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Establishing Interrater Reliability, Test-Retest Reliability, and
Construct Validity of the ScanCourse

RESEARCH ADMINISTRATION INSTRUCTIONS

The ScanCourse is an informal observational test which assesses a client's ability to integrate visual scanning and ambulation (Warren, 2006). The following instructions have been adapted from the Brain Injury Visual Assessment Battery for Adults (biVABA) Manual (Warren, 2006) with the author's permission.

The course is set up in a hallway (preferably a long hallway such as a corridor in the clinic). The hallway dimensions are not standardized. Cards containing numbers are placed on the hallway walls at various heights and distances from one another. To simplify calculation, 10 cards are placed one side of the hallway and 10 on the other side. The client is asked to move down the hallway pointing out or reading each card as they move. Missing a significant number of cards or stopping ambulation to search for and read cards indicates that the client is having difficulty integrating visual scanning with mobility. Missing cards on one side would indicate the client is exhibiting visual inattention or neglect.

Test Materials:

Provided:

- ScanCourse assessment forms
 - Demographic Information
 - Rater Assessment Forms (3 copies)
- 20 x 3.25" by 4.25" number cards (attached at end of instructions). Each number measures approximately 1.25". These cards can be duplicated using Arial, 120 pt font.

Not Provided:

- Paper cutter to prepare number cards
- Tape or mounting putty to attach the cards to the wall
- Laminating material for the number cards.

Procedure:

Preparation and Research Procedure:

1. Print the cards, laminate each page, and cut along the lines.
2. Attach the cards to the walls of the hallway at approximately knee (20"), waist (43"), and head height (71"), following the order and position of the below table. (Note: The client should not view this step).

3. Table 1: Standardized Number Positions

Position	Left	Right	Position
Head	5	11	Knee
Waist	18	7	Head
Waist	4	8	Knee
Knee	12	20	Waist
Head	17	10	Head
Knee	9	2	Waist
Waist	1	14	Head
Head	13	3	Knee
Knee	16	6	Waist
Knee	15	19	Head

Test Administration:

1. Instruct the client to read out or point to the numbers at the same time he or she moves down the hallway. Note: it is not necessary for the client to read the number on the card accurately; the client only must locate the card. (See script at end of instructions, or on Assessment Form). He or she is not to stop to read the cards. Do not prompt the client in any way (ie: do not remind to turn head, to look on both sides of the hallway, etc.)
2. Follow the client as he or she ambulates down the hallway and record the cards identified by the client.
3. Calculate the percentage of correct responses on each side of the hallway (i.e. 8/10 cards located on the right hand side indicates 80% accuracy in locating the targets on the right side during ambulation).

4. Optional: indicate the number of targets identified in each height range in the visual representation table.

Reminder: You are only having the client walk down the hallway in one direction (ie: 1 trial per session). This may differ from your usual administration of the ScanCourse.

Instructions to the Client:

“This is a test to see how well you search for targets when you are moving. Twenty cards with numbers have been placed in various positions on the walls of this hallway. Read out or point to the numbers as you see them. Do not stop and look for the cards. Continue moving and read the number on the card as you go by.”

References

Warren, M. (2006). *Brain Injury Visual Assessment Battery for Adults Test Manual*. Birmingham, AL: visAbilities Rehab Services.

SCAN COURSE RECORDING FORM

Instructions: *This is a test to see how well you see things around you when you are moving. Twenty cards with numbers have been placed on the walls of this hallway. Walk (wheel) down the hallway and read out or point to the numbers as you see them. Do not stop and look for the cards. Continue moving and read the number on the card as you go by. Do not give any prompts to client (ie: do not remind to turn head, to look on both sides of the hallway, etc.)*

Completed by:

Client Name: _____

OT: _____

Date: _____ (D/M/Y)

Visual representation of client's performance- write the number of identified targets and circle any sections in which on or more were missed

Feedback given? • Yes • No

Left	Position	Position	Right
Head	5	11	Knee
Waist	18	7	Head
Waist	4	8	Knee
Knee	12	20	Waist
Head	17	10	Head
Knee	9	2	Waist
Waist	1	14	Head
Head	13	3	Knee
Knee	16	6	Waist
Knee	15	19	Head

	LEFT	RIGHT
Head Level	/3	/4
Waist Level	/3	/3
Knee Level	/4	/3
TOTAL	/10	/10

Observations:

- Misses items on one side of hall
- Misses items on both sides of hall
- Turns head to scan
- Scans ahead
- Maintains even walking speed
 - Yes No
- Stops Walking
- Walks centered in hallway

Total	/10	/10	/20
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SUMMARY OF FINDINGS

The ScanCourse, which is a component of the Brain Injury Visual Assessment Battery for Adults (biVABA), examines a client's visual scanning ability while ambulating (Warren, 2006). The ScanCourse is often used in occupational therapy practice. However, there is no available research on the psychometric properties of this assessment.

The purpose of this study was to examine the interrater reliability, test-retest reliability and construct validity of the ScanCourse for use with clients with neurological impairments.

41 participants were included in this study. Participants had various neurological conditions such as stroke, Parkinson's disease, or brain injury, were able to mobilize independently, and communicate either verbally or through pointing. The mean age was 54 years old, 83% were male and 60% had experienced stroke.

To examine interrater reliability, a second rater was present for administration of the ScanCourse. To examine test-retest reliability, the ScanCourse was administered twice within a 2-week period. To assess level of agreement, a Bland-Altman plot was created. These results were used to calculate standard error of measurement. Finally, to assess construct validity, the scores of the ScanCourse were compared to scores of the Bells Test and Trail Making Test A & B.

The mean ScanCourse scores between administrations were 16.2 (first administration) and 17.4 (second administration) and exhibited excellent test-retest reliability (ICC(1,1) = 0.912; 95% CI = 0.811 – 0.959). The level of agreement based on the Bland-Altman plot was high, and the standard error of measurement was low (0.503). When observed by two raters simultaneously, ScanCourse scores were significantly correlated, indicating excellent inter-rater reliability (ICC(1,1) = 0.998; 95% CI = 0.996 – 0.999).

Scores on the ScanCourse were found to be significantly correlated with scores on the Trail Making Test A (N=35; $r_s=-0.436$; $p=0.009$), and B (N=36; $r_s=-0.364$; $p=0.029$). Scores on the ScanCourse were found not to be significantly correlated with scores on the Bells Test (N=41; $r_s=0.140$; $p=0.383$).

When using standardized administration protocol, the ScanCourse demonstrated excellent test-retest and inter-rater reliability among individuals with neurological impairments. As the Trail Making Test B is used to predict fitness to drive, future research could examine the use of the ScanCourse in driver rehabilitation.

References

- Chau, E., Nishi, A., Kristalovich, L., Holowaychuk, A., & Mortenson, W. B. (2020). Establishing the predictive validity of the ScanCourse for on-road driving performance. *American Journal of Occupational Therapy*, 75(2). PMID: 33399060 DOI: 10.5014/ajot.2021.041608
- Lund, P., Moir, C., Mortenson, W.B., Kristalovich, L. (2017). Evaluating the Measurement Properties of the ScanCourse, A Dual Task Assessment of Visual Scanning. *American Journal of Occupational Therapy*, November 2017.

Appendix

Standardized ScanCourse Cards.....10

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