Based on a classic visual search task by Poppelreuter, this task requires the location of a target shape in an 8 x 8 array of different shapes. The shapes are abstract geometric patterns. Search time is recorded and analyzed by location.

Purpose

SEARCH for Shapes is informationally dense and designed to demand much attention to all areas of the display. It is a task which calls for many skills, ranging from visual inspection, short-term visual memory, uniform scanning on both sides of the display, to sustained attention and frustration tolerance.

Materials

No special materials are required.

Procedure

SEARCH for Shapes involves visual search for the match to a centrally placed abstract pattern in an array of other shapes. None of the shapes is easily named and some are similar to the target. Response time is automatically recorded and displayed together with a distinctive double beep when quicker than a predesignated criterion value.

Explain to the patient that the task is to find the shape that exactly matches the one in the center. When doing an evaluation, it is usually best for the therapist to key in the response after the patient points to the target shape. You may use the arrow keys on the keyboard, or a mouse, to indicate which shape is the match. The response time is the time from the begining of the display to the first movement of an ultimately correct response. If the patient points to an incorrect shape, it is recorded as an error; however, average response times are computed only for correct trials. Another trial is presented later at the same location to substitute for the incorrect response

A response is finalized by holding the response box at the target location for a distinct interval, known as the 'dwell time.' For this reason it is important to continue moving the response box once a response has been started. If there is any uncertainty, increase the dwell time (see Changing the Settings).

Settings

1...Feedback? Default value: YES

Offer feedback on correctness. In certain evaluation situations one

might want to disable feedback. Otherwise, it helps the patient develop insight to have information on how quickly the target was found.

2...Response device Default value: KEYBOARD

The options are keyboard (use arrow keys) or mouse (trackball). Usually this choice is one of convenience. The mouse may be a little unreliable as it is rather sensistive and an inadvertent move may cause a premature "response."

3...Time Limit (sec) Default value: 60

How long do you want the computer to wait before signalling "Time?" The data are cleaner if the time limit is never exceeded; however the task may be dragged out undully if it is increased too much. We often increase it to 120 sec.

4...Response Registration Time Default value: 15

How long must the response box rest in one spot to register as a completed response? If the patient is pressing the arrow keys, one might increase this to 20 or 25 so that an inadvertent pause does not register as a response.

5...Goal Time (sec) Default value: 10

This is the limit for a desired response time. Responses within this time frame are followed by a positive "double beep." 20 sec is a more relaxed value for those who are challenged by this task.

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Results
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NOTE: If printed output was selected when you first started the COGREHAB programs, then
(1) the printout will contain whatever is displayed on the screen.)
(2) you may pause the display by pressing the <SPACE> bar. Freezing the display is useful for discussing the results with the patient

Results screen 1: Display by originally presented location.
Results are the time in seconds (accurate to hundredths of a second) from the target display until the first movement of the response box towards the target.

It is often helpful to ask the patient to analyze this screen, for example, to count how many trials were gotten in less than 10 or 20 sec on the left and right sides respectively.

Results screen 2: Statistical summary.
Mean and median response times are given for the targets on the left, right and both sides of the display, respectively. Also given are the % incorrect and the time limits exceeded. If the mean is noticeably higher

than the median, there were one or more excessively long trials. (Remember that in statistics, one very high number in a group will distort the mean and not change the median at all). Practically, if the mean is much higher than the median, you should suspect a lapse, such as would be caused by an attentional lapse, a visual field defect, or even a momentary seizure.

Clinical Findings

SEARCH challenges a variety of skills:
(1) shape inspection and matching and
(2) scanning the entire display
By observation one can often differentiate which of these is affected. In addition, compare the findings from SEARCH with those of SOSH (Search for the Odd Shape) and MATCH (Shape Matching). Problems with shape inspection and matching are suggested if the patient has difficulty with MATCH; while scanning may be implicated by difficulty with SOSH.

Normative Findings

Norms for SEARCH are from a Master's thesis by Celina Hall of Touro College. Two groups of 20 did SEARCH: a young adult group of students mostly in their 20's and a group of older drivers attending a day program at a senior center.

Response Times: Median / Mean / Standard Deviation

	Left	Right	Both
Students			
Seniors			

Relative to REACT and SOSH, response times for SEARCH tend to be highly variable. This variability may be associated with the inherent variation in the complexity of the shapes. This variability means that one should not be too quick to draw conclusions from SEARCH. A more prudent approach would be to run the procedure again, to see if the pattern of results is replicated.

Measure	Mean	StDev	Cutoff
SEARCH : Left average N = 20: 27.4 yrs	4.87 Source: C. Hall	2.64	10.15
SEARCH : Left average N = 20: 75 yrs	13.33 Source: C. Hall	4.11	21.55
SEARCH : Right average N = 20: 27.4 yrs	5.69 Source: C. Hall	1.71	9.11
SEARCH : Right average N = 20: 75 yrs	11.73 Source: C. Hall	4.09	19.92

SEARCH : Absolute difference		2.22	1.46	5.13
N = 20: 27.4 yrs	Source: C. Hall			
SEARCH : Absolute difference		3.83	2.37	8.57
N = 20: 75 yrs	Source: C. Hall			
SEARCH : Combined		5.28	1.83	8.94
N = 20: 27.4 yrs	Source: C. Hall			
SEARCH : Combined		12.53	3.52	19.57
N = 20: 75 yrs	Source: C. Hall			
SEARCH : Standard deviation		0.00	0.00	0.00
N = 20: 27.4 yrs	Source: C. Hall			
SEARCH : Standard deviation		0.00	0.00	0.00
N = 20: 75 yrs	Source: C. Hall			

Miscelleneous

This program does not run under Windows. You must exit Windows completely, or, in Windows 95, set the properties of the shortcut to force the program to run in DOS mode with a maximized window.

The reason for this requirement is that this program involves precision timing which WINDOWS (an inherently timesharing/multitasking program environment) does not do well. We have opted to maintain the program's timing over the convenience of running in Windows. However, we regret this inconvenience and continue to seek a better solution.

References

Gianutsos,R & Suchoff,IB (1997)
Visual fields after brain injury: Management issues for the occupational therapist. In M. Scheiman (ed.) Understanding and managing vision deficits. Thorofare, NJ: Slack Inc.

Gianutsos,R (1991c)
Visual field deficits after brain injury: Computerized screening. Journal of Behavioral Optometry,2(6),143-150.

Gianutsos,R (1997a)
Vision rehabilitation following acquired brain injury. In M. Gentile, Functional Visual Behavior: A Therapist's Guide to Evaluation and Treatment Options. Bethesda,MD: American Occupational Therapy Assn. (301 652-2682)

Gianutsos,R&Matheson,P (1986)
Disorders of visual perception. In M. J. Meier, L. Diller, & A. L. Benton (Eds.), Neuropsychological Rehabilitation. London: Churchill Livingstone. (Published by Guilford Press in US)

Gianutsos,R,Glosser,D,Elbaum,J&Vroman,G (1983)
Visual imperception in brain-injured adults: Multi-faceted measures.

Archives of Physical Medicine and Rehabilitation,64,457-462.

Variables Saved in *.CUM Disk File

Note: The information below is for use in reading the saved data into a spreadsheet, such as Quattro Pro. With this information one can identify what each measure represents. These procedures are somewhat technical, but useful for comparing performance across sessions.

Seq	Variable	Description	I/D	Chrs		Example
1	TASK	PROCEDURE NAME	I	8	D	SEARCH
2	NAME	LAST NAME	I	10	D	DOE
3	1ST	FIRST INITIAL	I	1	D	J
4	WHEN	DATE/RUN NO.	I	8	C	05079501
5	THGP	THERAPIST/GROUP	I	8	D	RG\TBI