

CVI Experience

Simulation of visual processing difficulties



BARTIMEUS SERIES

Bartiméus aims to record and share knowledge and experience gained about possibilities for people with visual disabilities. The Bartiméus series is an example of this.

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PREFACE

When a child is diagnosed with cerebral visual impairment (CVI), parents often have a lot of questions. What will it mean for the child's development, for education, for the future? Even self-evident parenting matters become uncertain and lead to questions.

When adults are diagnosed with CVI caused by an acquired brain disorder or degenerative conditions (such as dementia), it is often difficult for partners and the people around them to understand the consequences visual processing difficulties have for daily life.

The specialised centres for people with visual impairment provide support for children and adults with CVI and those close to them. For example, parents are equipped to feel more confident about the upbringing of their children, and answers are provided for the questions that arise during the course of the child's development. Partners, family members and caregivers for adults are given tools to deal with day to day living.

The support for children with CVI and their parents is characterised by extensive explanation and information. Together with her colleagues, Florine Pilon, orthoptist with Bartiméus, has been giving courses on CVI to parents, teachers and professionals for years. Parents feel this is a valuable way to share experiences with other parents. During one of these courses, a parent commented that she wished she could see through her child's eyes for a day, to experience how her child perceives the world. This was the seed that resulted in the development of the 'CVI Experience', an educational tool that allows parents, partners or professionals to experience the complexity of visual perception in a variety of ways. The CVI Experience has been used during several courses. Although CVI is impossible to simulate, this experiential tool provides valuable insight and increases understanding of the difficulties children and adults with CVI may face in daily life.

Irmgard Bals

Healthcare psychologist/neuropsychologist

Bartiméus Services

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INTRODUCTION

Visual perception is very important for daily functioning . We usually think the world is as we see it. We assume our perception is 'perfect' and correct. However, visual perception is a complex process. Our brains continuously process information that enters via the eyes, linking it to existing knowledge, integrating and interpreting it, allowing us to understand and recognise what we see. Brain damage can sometimes disrupt this process. This is known as Cerebral Visual Impairment (CVI).

Bartiméus is an expert in the diagnosis of CVI, and provides services for children and adults with this condition.

CVI is the most common cause of visual impairment in children in developed countries.

In children, CVI is caused by:

- congenital brain abnormalities, syndromes, metabolic disorders, epilepsy
- extreme prematurity, brain damage during or shortly after birth due to e.g. lack of oxygen, haemorrhage, infection or trauma

In young people and adults, CVI may be caused by brain damage (acquired brain disorders, ABD). ABI can be divided into three categories:

- Traumatic brain injury, for example due to an accident
- Non-traumatic brain injury, for example due to a stroke or tumour
- Progressive, degenerative neurological conditions such as dementia (Alzheimer's disease), Parkinson's disease or multiple sclerosis

Patients with CVI may have problems in different areas of visual information processing.

Primary visual functions such as visual acuity and visual field are usually abnormal, but some children and adults with CVI have normal visual acuity and/or visual fields.

Other problems include:

- Difficulties with visual recognition, for example of objects, shapes and faces
- Problems with visual attention and visual selection, like difficulties locating objects on a cluttered background. Or crowding (difficulties recognise an optotype surrounded by other optotypes) Needing more time to look and perform tasks
- Difficulties estimating speed, depth, distance and movement
- Difficulties with visually guided locomotion
- Difficulties with spatial orientation or finding the way
- Difficulties making smooth eye movements

Educating people about the cause and consequences of the disorder plays a key role in the care for children and adults with CVI at Bartimeus. We provide several courses for parents, teachers and carers involved with people who have CVI. During these courses we heard questions like: "What is it like to have CVI"? or How is it possible that my husband cannot find the bathroom in our house? These questions are difficult to answer. CVI cannot be emulated by "simulation" goggles, unlike many forms of visual impairment or visual field problems. We started a special CVI simulation project to answer these questions, called "When I look, I can't do everything at

once" (funded by the Bartiméus Sonneheerdt Foundation). This project first resulted in a method we tested during courses for professionals. Because there was interest from external partners, we decided to translate the manual into this book. It contains several simulation exercises to clarify this specific form of visual impairment.

CVI Experience is designed to allow a person to experience the complexity of visual information processing. CVI Experience encompasses several areas of visual perceptual capacities where problems can develop. It can help normally sighted people to understand the difficulties their child, pupil, or partner are faced with.

Anjoke Roetink, Marjoke Dekker, Marian Doeve and Greetje Koevoets contributed to this project. Your creative input was enormous. Thank you! I also want to thank Mies van Genderen, Heleen Veen, Irmgard Bals and Saskia Damen for their critical revision. Enjoy the CVI Experience!

January 2014

Florine Pilon, orthoptist

INSTRUCTIONS FOR USE CVI EXPERIENCE

CVI Experience consists of two chapters. Both are divided into a number of sections:

1. Crowding
2. Recognition of objects, shapes and faces
3. Visual attention and selection
4. Estimating speed, depth, distance and movement
5. Visually guided locomotion
6. Finding the way

Each section begins by briefly introducing the topic, discussing problems that disruption of visual perception can cause, and the potential strategies that may be followed (chapter 1). Various simulation exercises are described for each chapter (Chapter 2).

This book includes a download with all files that can be used in the exercises. Some items fall into multiple categories and can be applied in different situations. There are also a few exercises pertaining to the topic of eye movements and time. This can be downloaded for free at <https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

Only succinct theoretical information on CVI is provided. More specific information about CVI may be found on the Bartiméus website (www.Bartimeus.nl/CVI). The exercises can be used during education, courses or lessons for children as well as adults.

A selection of specific exercises can be made based on the amount of available time, group size, etc. We recommend allowing ample time to evaluate the exercises after completion with all participants . In this evaluation, it is important to provide attention and space for experiences and potential frustrations. Solutions and strategies are also covered. The recommended time given for each exercise does not include evaluation.

Chapter 1 Sections

1. Crowding
2. Recognition of objects, shapes and faces
3. Visual attention and selection
4. Estimating speed, depth, distance and movement
5. Visually guided locomotion
6. Finding the way, orientation in space
7. Eye movements

Section 1: Crowding

Introduction

Crowding literally means: a large number of collected individuals, a crowd. Visually, crowding is the phenomenon where a person cannot distinguish individual visual stimuli that are close together, or has difficulties locating objects against a cluttered background. In ophthalmology, crowding is used to describe the difference between visual acuity with individual symbols and visual acuity with symbols in a row. In crowding, naming or recognition of individually presented letters (angular vision) is better than naming or recognising letters combined in a word (linear vision).

Crowding can cause the following problems:

- Reading difficulties, such as:
 1. Jumbled letters
 2. Difficulties reading maps
 3. Difficulties finding information on websites, in an e-mail inbox, on a mobile phone
 4. Difficulties reading information in brochures, newspapers, magazines.
- Difficulties identifying objects against a busy background. For example not being able to find jam on a full breakfast table or in a full cupboard, or difficulties finding a toy in a full box.
- Difficulties seeing parts of a busy image, such as a worksheet, drawing or magazine.
- Difficulties reading markers on equipment such as coffee machines or a scale
- Difficulties finding a person in a large group of people

Possible complaints caused by crowding include:

- Having too little time to see or read something
- Visual overstimulation/visual fatigue
- Making more errors, for example when reading
- Other reading (and learning) difficulties
- Misinterpretation of intelligence tests, school tests, etc.
- Reduced self-sufficiency
- Social problems due to not being understood
- Frustration
- Passiveness

Strategies for countering problems caused by crowding:

General:

- Minimise the number of stimuli
- Position objects separately
- Use contrasts
- Furnish classroom, playroom, living room, etc. with few visual stimuli
- Use a calm background, such as an unpatterned tablecloth or a contrasting placemat

- Use as few objects as possible and do not place them too close together. For example, only set out a few types of sandwich toppings when laying the table. Do not put any unnecessary objects on the table, such as a vase of flowers or candles.
- Only place essential items on the shelf above a sink. Separate the items and ensure good contrast.
- Use a clear storage system: do not put too much in one cupboard
- Do not do (too) much at once, and keep visual stimuli in mind. For example: Turn off the radio do not have the person perform a visual task and conduct a conversation at the same time

In the field of reading:

- Cover part of the text or image
- Enlarge the text or image
- Cut out and enlarge part of the text
- Use the simplest font possible
- Increase the distance between letters, symbols, words and sentences
- Use colour contrasts, for example change the colour of the first and last word of a sentence.
- Ensure a calm page layout, so avoid excessive numbers of images or separate text boxes
- On a computer, text size, distance between letters, etc. can be adjusted easily
- Avoid symbols and icons, for example on the computer desktop
- Use digital files and/or speech support

1 Crowding Simulation Tests

Test 1.1 On the beach

Test 1.2 Rubber ducks

Test 1.3 Braille

Test 1.4 Number drawing

Test 1.5 Finding patterns

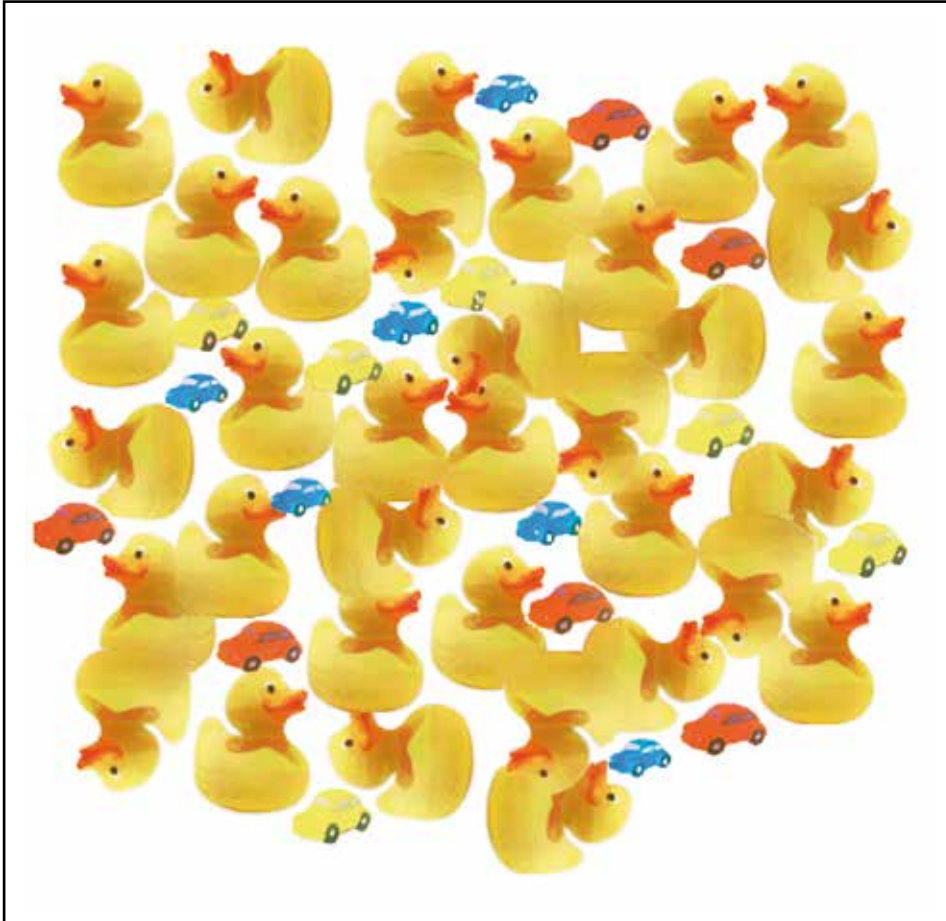
Test 1.6 Tongue twisters

Test 1.7 Breakfast time

The tests are described in Chapter 2.

Corresponding materials may be found at the free download at

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Section 2: Recognition

This section is divided into facial recognition and recognition of shapes and objects.

Introduction to facial recognition

There is a specific area of the brain involved in recognising faces. This is also the area for recognising/understanding facial expressions and body language. The ability to recognise faces and read facial expressions is important for social interactions. You look at faces to recognise a person and/or determine: who is this person, is it a man or a woman, how old is this person? Facial expressions also provide important information: how does a person feel, how does a person respond to me; is he/she focused on me, does he/she want something from me? Not recognising faces and facial expressions is a serious social handicap. Failure to recognise an angry expression, a happy smile, a bored or sad face makes it difficult to gauge the reactions of others.

Possible complaints caused by difficulties recognising faces include:

- Difficulties recognising a person in face to face contact and/or on a photograph
- Difficulties recognising a classmate if you run into him/her
- Not greeting acquaintances when you pass them on the street
- Difficulty tailoring your response to the facial expressions of the other
- Difficulty recognising carers or leaders in a department, classroom or group
- Difficulties gauging social situations

Strategies for combating problems caused by reduced facial recognition:

- Learn to recognise people based on other, usually auditory information
- Pay attention to vocal characteristics, clothing colour, physical movements, smell
- Make agreements about how to recognise a carer on field trips
- Advise carers, teachers, group leaders, parents and acquaintances to wear recognisable clothing, for example with a striking colour.
- Identify yourself by saying your name.

2 Facial recognition simulation tests:

Test 2.1 Who is it?

Test 2.2 Who is the real "Bart"?

Test 2.3 Faces memory game

Test 2.4 Reversed faces

Test 2.5 Sports team

Test 2.6 Confused

Test 2.7 Reading the mind in the eyes

The tests are described in Chapter 2.

Corresponding materials may be found at the free download at

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Introduction to Recognition of shapes and objects

The ability to give meaning to visual stimuli is necessary to understand the world.

Recognising objects and people in the environment is not as self-evident for people with CVI as it is for us.

Damage to the brain can cause difficulties at the level of recognising and giving meaning to objects, images and drawings, shapes and symbols (letters/numbers).

Possible complaints caused by difficulties recognising shapes include:

- Difficulties recognising two and/or three dimensional shapes
- Difficulties recognising images on pictures and photographs
- Difficulties relating objects (three dimensional) to images on paper (two dimensional)
- Difficulties recognising symbols, such as letters and numbers
- Difficulties recognising objects from different angles, for example the bottom of a shoe.
- Difficulties with visual closure - the ability to recognise an overall image even if the lines are interrupted, or to recognise a half-hidden object as if it were fully visible.

Strategies for combating problems caused by reduced shape recognition:

- Use contrast
- Provide verbal support: say what you see
- Use colour
- Make sure the entire object is visible
- Avoid confusing shadows
- Let children experience things step by step. Start by usual actual objects, then move on to photographs, colour drawings, and black-and-white drawings step by step.

2 Simulation tests for object and shape recognition:

Test 2.8 What is it?

Test 2.9 What do you see?

Test 2.10 Chinese

Test 2.11 Can you read this?

The tests are described in Chapter 2.

Corresponding materials may be found at the free download at

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Section 3: Visual attention and selection

Introduction

Visual attention is a way for the brain to select incoming visual information and filter out irrelevant information. Disrupted visual attention is the inability to focus or maintain visual attention and/or the inability to divide and shift visual attention. This is a common problem in CVI. Disrupted visual attention can cause a lot of problems during everyday activities. Attention is the gatekeeper for visual development.

Visual attention can be divided into three parts:

- Selective attention: how well can you focus your attention on one thing and ignore the other
- Sustained attention: keeping your attention focused on something, looking at something for a long time, concentrating on it (selective attention is a requirement for this)
- Divided attention: the ability to shift attention from one topic to another

Potential complaints due to problems with visual attention include:

- Difficulty performing multiple tasks at once: not being able to look and move, look and listen at the same time, etc.
- Difficulties noticing something if too much other information is provided: not recognising someone in a group, not being able to locate objects among other objects
- Difficulty functioning in a visually complex environment, resulting in swift fatigue, for example: visiting the zoo, birthday parties, busy shopping streets or supermarkets

Strategies for reducing the problems caused by reduced visual attention:

- Provide a calm room with few stimuli or shield off a workplace
- Limit visual information, for example by presenting information separately or covering part of it
- Avoid having a person look and move or listen at the same time: provide instructions in advance, for instance
- Ensure good contrast with the background

3 Simulation tests for attention and selection:

Test 3.1 Pencil trick

Test 3.2 Selective attention videos

Test 3.3 Switching watering can

Test 3.4 Group attention test

Test 3.5 Multi-tasking

The tests are described in Chapter 2.

Corresponding materials may be found at the free download at

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

Sections 4 and 5: Estimating speed, depth, distance and movement and Visually guided locomotion

Introduction

We live in a three-dimensional world. Everything has height, width and depth. Our retina, which collects the images of the world around us, is two dimensional. In order to function and move in the three dimensional world, the brain needs to shape the two-dimensional images received by the retina into a three dimensional world. This happens in two ways:

- Stereopsis: when both eyes receive a good quality image at the same time, the images hit the retina at a slightly different angle. This is interpreted as depth by the brain. This principle is used in 3D movies, for example. This form of depth perception only works if both eyes can see and cooperate.
- Processing of visual information based on the following features: perspective, light and shadows, size and shape, object constancy, movement, detail observation, etc. This form of depth perception also works when using only one eye (monocular vision).

We will not address stereoscopic vision in any more detail here. We will focus on monocular depth perception, as this may be specifically impaired in CVI.

Monocular depth perception is created based on:

Object size and constancy:

If you look at an object from different angles, the image changes continuously. Walk around a chair, and you will see its shape change. Walk away from the chair and it will appear smaller. And yet, you still observe the same chair. You know the chair has not changed shape or suddenly become smaller, although you do see that. Based on this, you conclude the chair is further away, or that you are viewing it from a different angle. The size of an object is a strong clue for determining the distance to the object.

Brightness and contrast, light and shadow:

We have learned that light comes from above (sunlight, lamps), not below. When you look at a concave object, you see the bottom is lighter than the top. A convex object is lighter on the top.

Movement:

A car passing close by appears to be moving faster than one driving past at a distance. Distance to the car is estimated in part based on speed of movement.

Perspective:

An important way to determine the relationship between distance and size is linear perspective. A good example of this is train tracks: the tracks appear to converge in the distance.

Detail observation:

If something is further away, fewer details can be distinguished. This can provide information about the distance to an object.

Interpreting what we see is based on combining all of these clues. If a situation is familiar or a person has a lot of viewing experience, interpretation is faster and better.

Visual illusions:

The test material for estimating speed, depth, distance and movement includes visual illusions. These visual illusions can be used to make people aware of visual information processing. Visual illusions are not 'errors' in the visual system. The system responds as it always does. In an illusion, our perception is 'fooled', while our understanding is correct. We see something is wrong, and we know that it's wrong. It highlights the tension between visual perception and understanding.

Possible complaints caused by difficulties estimating include:

- Difficulties estimating distance and depth: walking down stairs, knocking over cups, feeling with feet when there are colour differences on the floor, stumbling, falling
- Not perceiving something if you are moving yourself, or if something else is moving: for example judging distance or speed of other road users while cycling
- Difficulties seeing moving objects, such as a rolling ball difficulties estimating distance and speed in traffic

Strategies for countering the effects of difficulties estimating:

- Using colour and points of reference
- Practising steps and walking stairs together, holding on to the carer's elbow (body posture supplements visual information).

4 Simulation tests for judging speed, depth, distance and movement:

Test 4.1 Goals

Test 4.2 Arches

Test 4.3 Tables

Test 4.4 Amis' Room

Test 4.5 Froggie

Test 4.6 Video clips

5 Simulation tests visually guided locomotion:

Test 5.1 Mirror test

Test 5.2 Foot out of whack

Test 5.3 Motion in space

The tests are described in Chapter 2.

Corresponding materials may be found at the free download at

<https://www.webedu.nl/downloads/Bartimeus/download%20CV1%20Experience.zip>



Section 6: Finding the way, orientation in space

Introduction

Difficulties with finding the way, or in thinking/planning out a route in your head can be characteristics of CVI. This can happen in both familiar and new environments.

Possible complaints due to difficulties with finding the way include:

- It takes a long time for familiar routes to become second nature, for example the route to school or the supermarket
- Mobility difficulties, for example in traffic or finding the way to the supermarket, or maintaining an overview at a crossing
- Obtaining an overview in a (new) space or situation is impossible or takes too long (staying close to parents/carers)

Strategies for combating the consequences of difficulties with finding the way:

- Use colour recognition
- Use fixed routes, for example with a book containing photos of points of reference along the way
- Explore the area together. Are there audible and/or touchable signposts along a route?
- Practise (for children: treasure hunts, hide and seek)
- Allow enough time for habituation
- Check traffic safety. Cycle together or use a tandem bicycle

6 Finding the way simulation tests:

Test 6.1: Where am I?

Test 6.2: Rush Hour

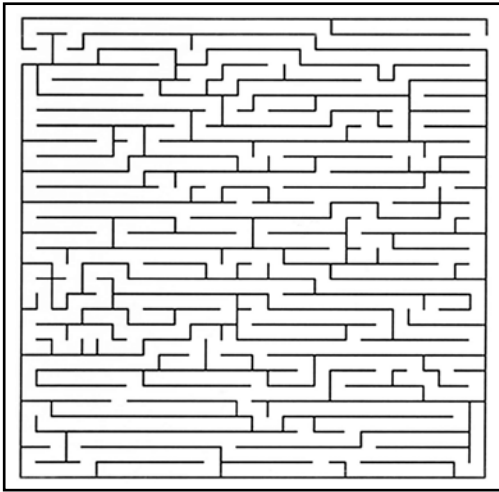
Test 6.3: Maze games

Test 6.4: Follow the arrow maze

The tests are described in Chapter 2.

Corresponding materials may be found at the free download at

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Section 7: Eye movements

Introduction

The following problems are sometimes present in CVI:

- Difficulties with smooth eye movements
- Difficulty with pointing the eyes towards a selected object
- Inability to move the eyes voluntarily

Possible complaints due to eye movement difficulties include:

- Difficulty with reading
- Difficulties using a communications device (computer, smartphone, tablet)
- Too little viewing time
- Difficulties with mobility, for example in traffic
- Difficulties with eye contact

Strategies for combating the consequences of eye movement difficulties:

- Covering or pointing with a finger while reading, looking at photographs, doing puzzles
- Take this into consideration when selecting a communications and/or mobility device (e.g. wheelchair)
- Allow for extra time
- Remain particularly alert during participation in traffic
- Adjust the image when reading on a screen: for example, use individual words or sentences or present them at a slow rate.

7 Eye movement simulation tests:

Test 7.1: Eye movement test

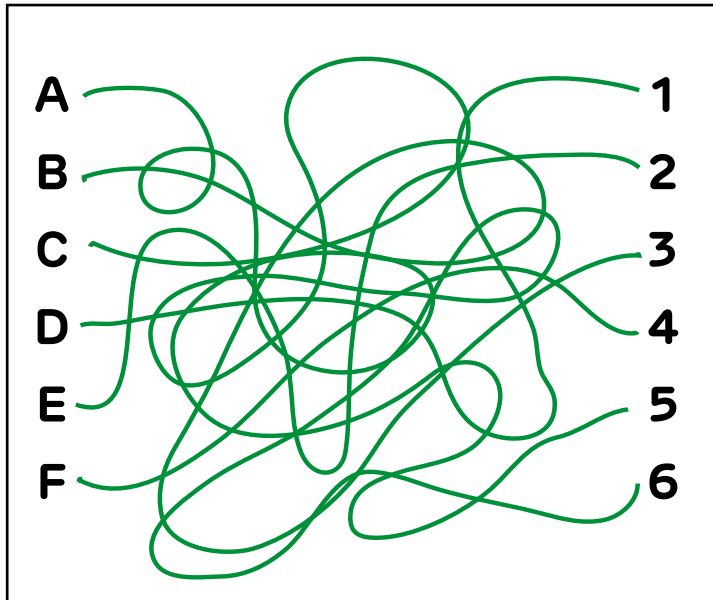
Test 7.2: Dancing dolls

Test 7.3: Line game

The tests are described in Chapter 2.

Corresponding materials may be found at the free download at

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Chapter 2 Test materials

1. Crowding
2. Recognition of objects, shapes and faces
3. Visual attention and selection
4. Estimating speed, depth, distance and movement
5. Visually guided locomotion
6. Finding the way, orientation in space
7. Eye movements

Test reaction time

Section 1 Crowding

Crowding Test 1.1

Title: At the beach

Brief description: Image of a beach with letters of the word "crowding" hidden in it

Number of participants: Unlimited

Duration: 5 minutes

Required:

- Poster with image or slide for presentation
- Pen and paper for the participants (optional)
- Stopwatch

To do:

- Which word is hidden in the image?
- If they cannot find the word: say the word and have them look again, or state individual letters

Experience

Participants experience how difficult it is to recognise something against a busy background.

Explanation

Finding a single stimulus against a busy background is difficult.

Material for this test is on the free download, under number 1.1

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Crowding Test 1.2

Title: Rubber duckies

Description: Posters with a group of rubber ducks and yellow, red and blue cars

Number of participants: Unlimited

Duration: 10 minutes

Required:

- Poster with image or slide for presentation
- Pen/pencil and paper for the participants (optional)
- Stopwatch

To do:

- Count the yellow, red and blue cars. Which colour is easiest to spot?

Experience

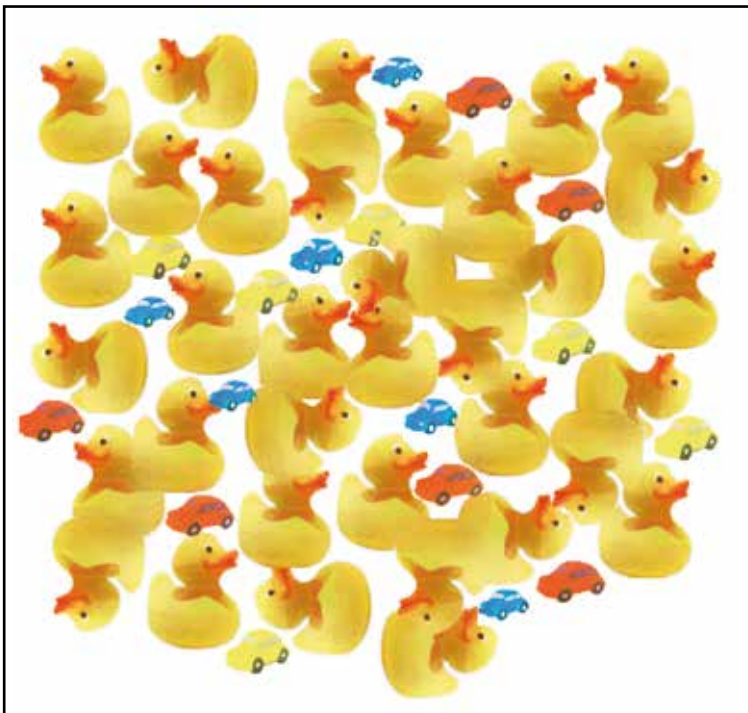
How does a contrasting colour influence the situation? Is it easier to see if it's closer to the edge of the image? What is the effect of more or less time?

Explanation

When difficulties occur due to crowding, it can be very helpful to use a contrasting colour, place an object near the edge and/or provide more time.

Material for this test is on the free download, under number 1.2

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Crowding Test 1.3

Title: Braille

Brief description: Finding the letters of a person's own name or another word in the braille alphabet.

Number of participants: Unlimited

Duration: 10 minutes

Required:

- Copies of search pages and the braille alphabet
- Pen/pencil and paper for the participants (optional)
- Stopwatch

To do:

- Circle the letters of your own name (or other word). Time the exercise: who finishes first?
- There are various levels of complexity: Ordered letters are less complex than letters that are mixed together.

Experience

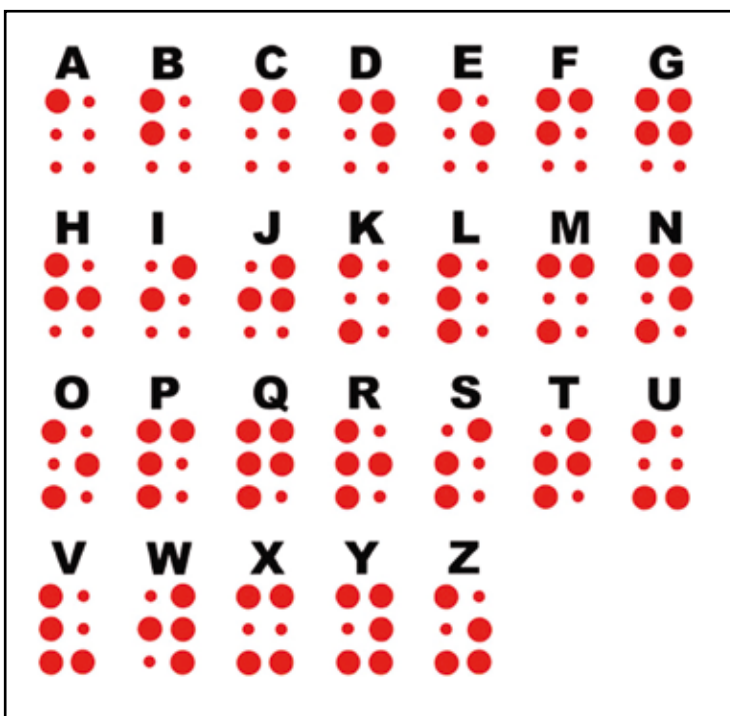
The fuller it is, the more difficult it is. Using a contrasting colour can help.

Explanation

The more stimuli, the more difficult it is. It is also more difficult if the letters are very similar and/or are jumbled together. A contrasting colour can help to find a letter faster.

Material for this test is on the free download, under number 1.3.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Crowding Test 1.4

Title: Connect-the-dots drawing

Brief description: Two intersecting connect-the-dots drawings

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Copies of the connect-the-dots drawings
- Stopwatch
- Pencil for participants

To do:

- Complete the connect-the-dots drawings
- Time the exercise (who is the fastest)

Experience

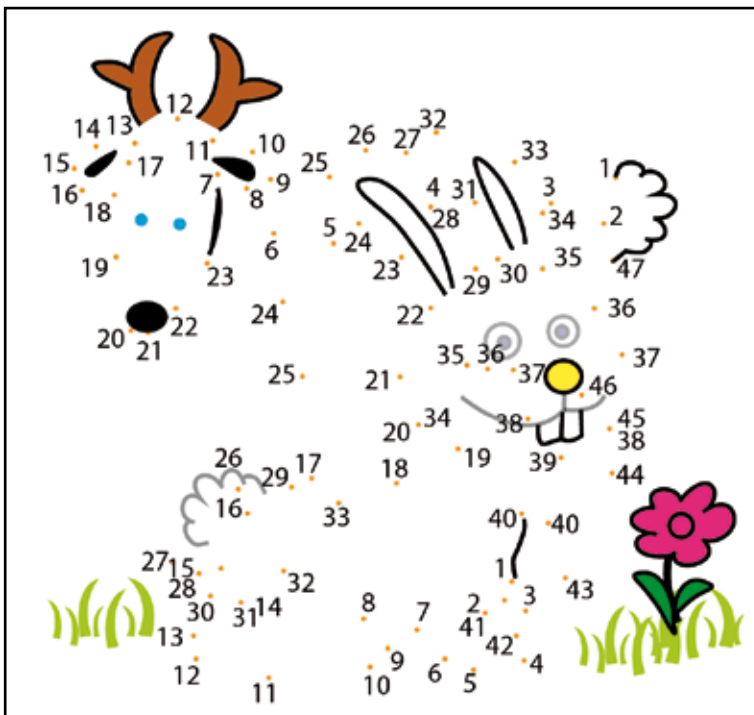
Having the pictures intersect will make it difficult to complete the connect-the-dots drawings. The connect-the-dots drawings individually are not difficult.

Explanation

Many similar stimuli clustered closely together are confusing.

Material for this test is on the free download, under number 1.4.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Crowding Test 1.5

Title: Finding patterns

Brief description: Find the patterns near the edge within the frame

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Copies of the exercise
- Stopwatch
- Coloured pencils
- Cover sheet

To do:

- Colour the different patterns in the frame; each pattern is repeated 6 times
- Variation: count how often one pattern occurs as quickly as possible. You have one minute

Experience

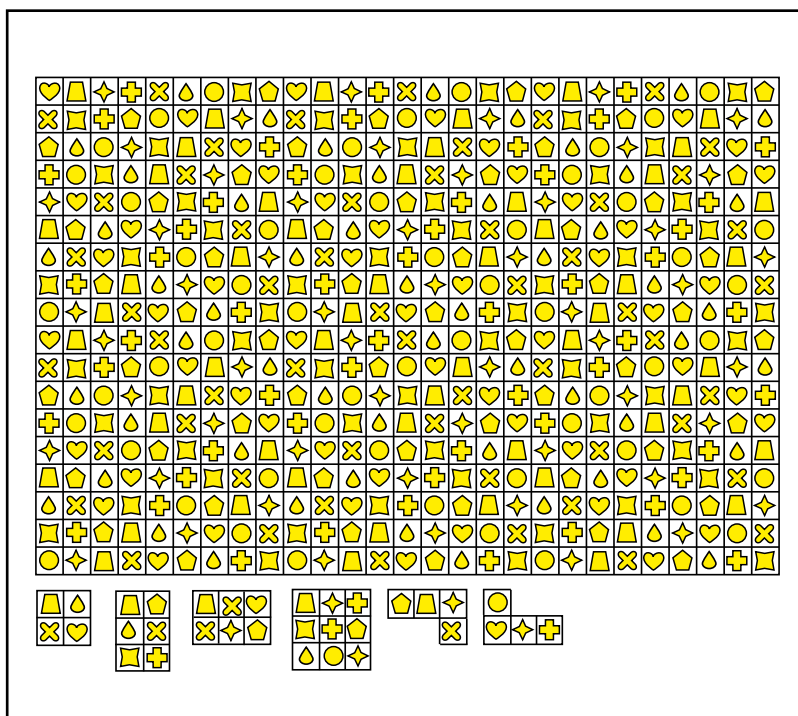
Finding the patterns in the frame is difficult because they are close together and look similar

Explanation

People who have problems with crowding have difficulty finding patterns in the smaller frame. Colouring in the patterns can help.

Material for this test is on the free download, under number 1.5.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Crowding Test 1.6

Title: Tongue twisters

Brief description: Tongue twisters

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Copies
- Stopwatch

To do:

- Read the sentences; for example, have participants take turns reading a sentence out loud. Record the time and count the number of errors or sentences that participants were not able to read.

Experience

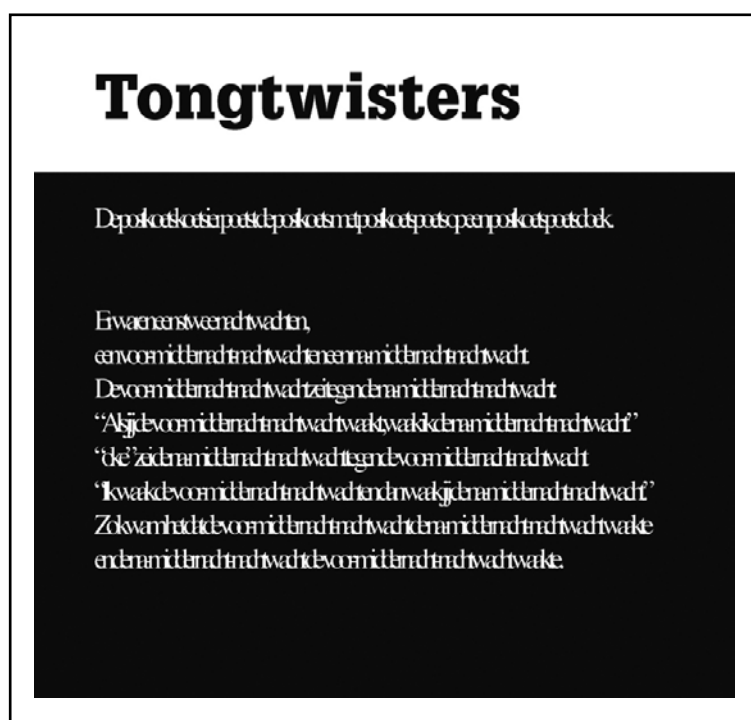
The closer together the sentences and letters are, the more difficult it is to read.

Explanation

People with CVI may have problems distinguishing between visual stimuli that are close together. Sometimes they say that the letters are embracing each other, like you see in the test. You can see how difficult it is to read these tongue twisters. It would be easier with more space between the letters, as is often done for reading texts for people with CVI.

Material for this test is on the free download, under number 1.6

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Crowding Test 1.7

Title: Breakfast time

Brief description: Breakfast or lunch at a very full table

Number of participants: 5 to 12

Duration: total of 20-45 minutes

Introduction: 3 minutes

Experience: 10 minutes

Feedback: 7 minutes

Required:

- Floral tablecloth
- Colourful cutlery, cups and glasses
- Cutlery and cups with a strong colour contrast or placemats
- Taped up glasses to simulate visual impairment, parts completely occluded or a blindfold,
- Pills or small sweets that look like pills.
- Pitchers of water
- Radio/CD player
- Pudding or another dessert
- Comb and pin
- Rusks, butter and sugar
- Hand cream, body lotion

Make sure the table is set in advance.

Goal

Have participants experience the impact of visual impairment during a recurring, everyday moment: breakfast.

Participants experience the difficulties associated with a cluttered table, lacking contrast and performing care activities during the meal.

Participants experience different methods for helping with a simple care activity: handing out pills, applying hand cream or combing hair.

To do:

Give a verbal introduction, for example:

You can tell people about visual impairment and the impact it has, but the message comes across

best if you experience what visual impairment means yourself. Using the glasses we brought with us, you will be able to gain an impression of visual impairment. The glasses provide an impression - no more, no less. We cannot show you what a visually impaired person sees exactly using only glasses. We also cannot exactly simulate the psychological situation. However, simulation glasses can provide insight into impaired vision, something not easily achieved with words alone. Ironically, the simulation glasses can really be an eye-opener.

Participants go into the hallway (or another room where they cannot see what is on the set table) and put the glasses on. The course leader calls the participants inside. Most participants will pick their own seats at the table. One of the participants is led in by the course leader. Once seated, this participant's hair is combed and a hair pin is put in place. A few other participants will be subjected to an unexpected, quick action: smoothing a dress, straightening a chair, a pat on the shoulder, fixing a shirt collar.

The radio is on to 'set the mood'.

Participants are instructed to prepare a rusk (remove from package, hand them to each other, spread butter, put sugar on top and eat it) and pour a glass of something to drink.

In the meantime, the course leader gives a few participants a pill, hidden in a mouthful of pudding. For a few participants, she simply inserts the pill into their mouths, says "here are your pills", and then vigorously cleans their mouths. For others, she announces this verbally and performs the action calmly. You may also choose to apply hand lotion to someone. This is often confusing: a care activity during mealtime and/or a smell that doesn't fit with breakfast (=unpleasant).

Experience

Discuss the activity, for example by asking the following questions:

- Which parts of this experience were pleasant? Which parts were unpleasant?
- Why is that?
- What were you able to see, and what were you not able to see? Why is that?
- What about the auditory environment?
- How did it feel to be touched without being asked, or to have something put into your mouth?
- Did you know who was being talked to? How can you solve that?
- Which other senses did you use, and how did that feel?
- What did you learn from this, what will you do differently tomorrow?

Areas for attention are:

- Verbal announcement or using participants' names
- Approach someone within their visual field
- Give clients the time they need
- Appeal to hearing, touch, smell, taste
- Use colour / contrast / order
- Clearly end contact
- Auditory environment / lighting



Section 2 Recognition of objects, shapes and faces

Recognition Test 2.1

Title: Who is it?

Brief description: Identify the three people you saw at the beginning of the presentation

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Exercise is integrated into a PowerPoint presentation
- Pen and paper
- Three slides with a photograph of one person
- Slide with 24 people

To do:

- Three slides with a face are briefly shown at the beginning of the presentation.
State that you will briefly show three pictures. Don't provide any other information
- At the end of the presentation, or after about 20 minutes or longer, the slide with 24 people on it is shown. You do not mention this to the participants beforehand
- The participants write down the numbers of the three people they saw at the beginning of the presentation

Experience

It is difficult to recognise faces after a prolonged period of time and among other faces. Memory plays a key role here.

Explanation

Facial recognition is a special kind of recognition. In the case of CVI patients, children and/or adults may have difficulty in recognising faces. Other recognition items, such as the colour of clothing, etc. become more important. This is a serious social handicap.

Material for this test is on the free download, under number 2.1.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Recognition Test 2.2

Title: Which one is the real "Bart"?

Brief description: Recognising the person you saw at the beginning of the presentation

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Images of 12 "Bart" heads (a bald person).
- Stopwatch

To do:

- Exercise can be integrated into a PowerPoint presentation
- One of the "Bart" pictures is shown at the beginning of the presentation
- About 15 minutes later, the slide with the 12 "Barts" is shown, and participants are asked to select the "Bart" shown at the beginning of the presentation
- On paper: the presenter shows an A4 size sheet with a picture of "Bart" for a few seconds
- About 10 minutes later, participants are given the A4 sheet with the 12 "Barts" and are asked to write down the number of the real "Bart"

Experience

It is very difficult to select the right person when choosing between faces that are very similar.

Explanation

Facial recognition is a special kind of recognition. In the case of CVI patients, children and/or adults may have difficulty in recognising faces and facial expressions. This is a serious social handicap.

Material for this test is on the free download, under number 2.2.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Recognition Test 2.3

Title: Memory game with faces

Brief description: Players try to match as many pairs of cards with the same image as possible.

Number of participants: Depends on the number of memory games, 4 participants per game

Duration: 15-20 minutes (depending on the number of cards used)

Required:

- Cards with pictures of faces - 12 faces, 24 cards

To do:

- Print the document with faces on card stock and cut them out
- You may choose the number of memory cards to play with (maximum of 24)
- The cards are shuffled and placed face down on the table
- People take turns in a clockwise direction
- A player turns over two cards in each turn
- If the cards pair up, the player keeps the cards and turns over two more cards
- If the faces are not the same, the next player takes a turn
- The game is over when all cards have been picked up. The player with the most pairs wins

Experience

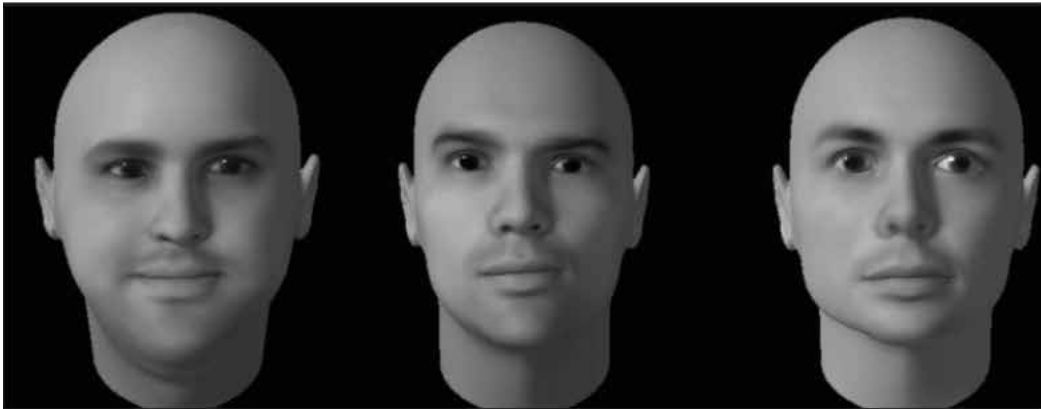
Finding pairs is difficult if the faces are very similar.

Explanation

In the case of CVI patients, children and/or adults may have difficulty in recognising faces and facial expressions. This is serious social handicap.

Material for this test is on the free download, under number 2.3.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Recognition Test 2.4

Title: Reversed faces

Brief description: Who is this person?

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Exercise is integrated into a PowerPoint presentation
- Slides with pictures of public figures, without hair and upside-down.
- Pen and paper

To do:

- The slide is shown with the image of the upside-down head of a public figure without hair
- Participants indicate verbally or write down who this person is
- If the participants are not able to recognise the person, flip the slide right side up, and then show the image with hair

Experience

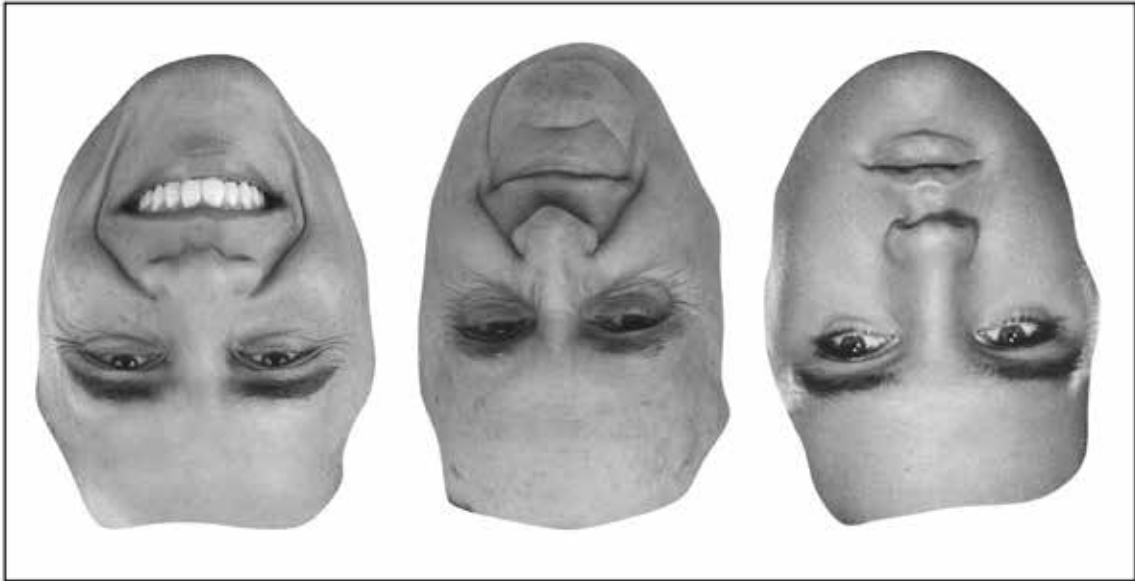
It is very difficult to recognise a person if you see an image of their face upside-down and without hair.

Explanation

People often have difficulty recognising upside-down faces, while they have much less difficulty with everyday objects that are upside-down. That is because our brains have specialised in recognising faces that are right side up, because we almost never see people upside-down. The top of the face appears to play a greater role in facial recognition than the bottom half. Hair is the most important aspect, followed by eyes, nose and to a lesser degree mouth and chin. Facial recognition is a special kind of recognition.

Distortion of the face is not/hardly noticed in the upside-down version of the photograph.

Material for this test is on the free download, under number 2.4
<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Recognition Test 2.5

Title: Sports team

Brief description: What's wrong with this picture?

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Exercise can be integrated into a PowerPoint presentation
- Image / slide of the sports team

To do:

- Look at the photograph/slide of the sports team and try to see if you notice anything unusual about the players.

Experience

Participants feel that it is difficult to look for things in a setting where objects share similarities in shape and colour. In the picture, the athletes all have the same face, but have different haircuts.

Explanation

Facial recognition is a special kind of recognition. In the case of CVI patients, children and/or adults may have difficulty in recognising faces and facial expressions. This is a serious social handicap.

The top of the face appears to play a greater role in facial recognition than the bottom part. Hair is the most important aspect, followed by eyes, nose and to a lesser degree mouth and chin.

Material for this test is on the free download, under number 2.5.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Recognition Test 2.6

Title: Between the beans

Brief description: Find the face between the coffee beans

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Exercise can be integrated into a PowerPoint presentation
- Image/slide of coffee beans with a hidden face

To do:

- Find the face between the coffee beans

Experience

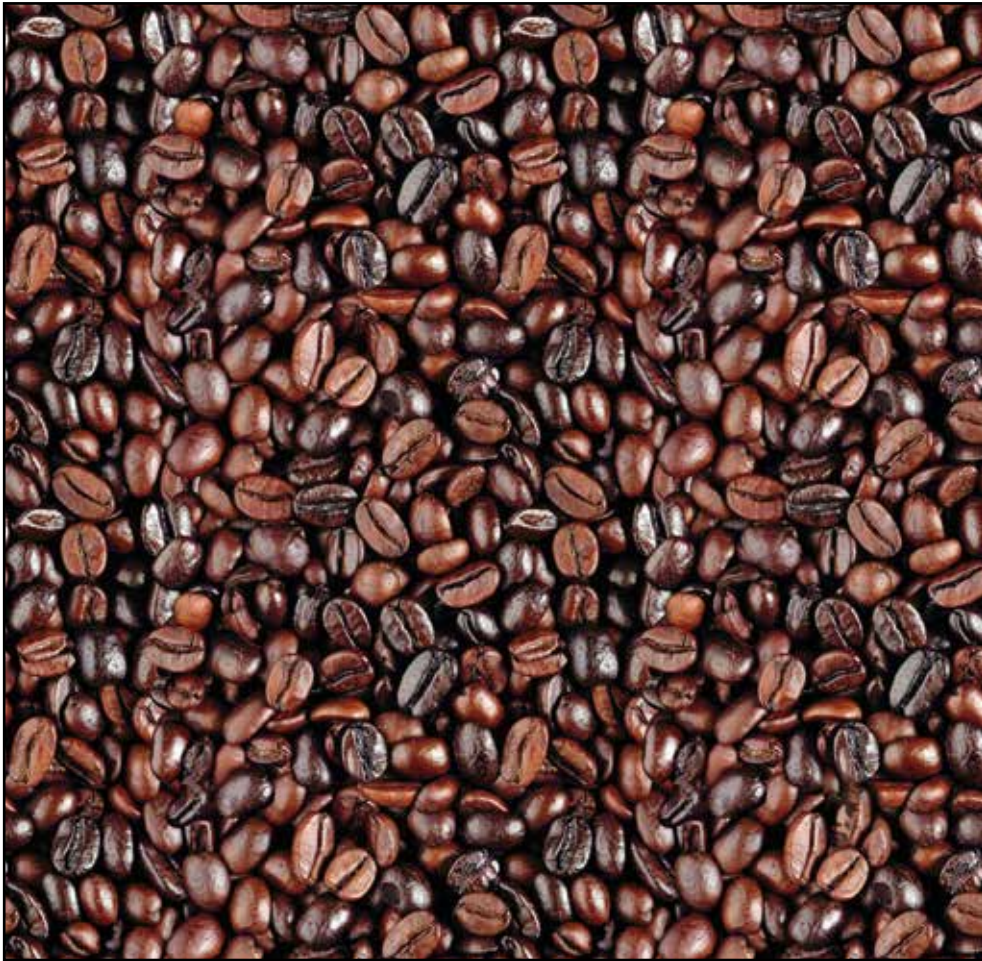
Participants feel that it is difficult to look for things in a setting where objects share similarities in shape and colour. A picture of a man can be seen in the bottom of the picture

Explanation

In this exercise, participants are not told - for example - how large the face is that they are looking for. It would be helpful if you know the size of the face you are looking for and the section where it is hidden. Facial recognition is a special kind of recognition. In the case of CVI patients, children and/or adults may have difficulties recognising faces and facial expressions. This is a serious social handicap.

Material for this test is on the free download, under number 2.6.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Recognition Test 2.7

Title: "Reading the mind in the eyes" test

Brief description: Reading emotions in the eyes

Number of participants: Unlimited

Duration: 20 minutes

Required:

- Computer with an internet connection per participant, or the test can be done on paper
- Pen

To do:

- Take the test: compare your answers with the correct answers
- Provide instructions: For each pair of eyes, pick the word that best describes what the person is thinking or feeling. If you have no idea, select the option that 'feels best'. Tick the correct answer. After completing the test, you can compare your answers to the correct answers at the bottom of the test.

Experience

Reading emotions from the eyes alone is difficult, and people with facial recognition problems have a lot of trouble with this.

Explanation

The test "Reading the mind in the eyes" was originally designed as an instrument to measure to what degree a person's eyes can be used to read what a person is thinking or feeling. People with an autism spectrum disorder often score poorly on this test. People who have difficulty recognising faces will likely also score poorly on this test.

The original version of this test can be taken at:

<http://www.questionwritertracker.com/quiz/61/Z4MK3TKB.html>

or can be found by typing "reading the mind in the eyes" into a search engine.

The Dutch translation and RME test calculation script can be found at:
http://www.deautismecoach.nl/deautismecoach/autisme_rmetest.htm



Recognition Test 2.8

Title: What is it?

Brief description: What do you see in the picture?

Number of participants: Unlimited

Duration: 5 – 10 minutes

Required:

- Exercise can be integrated into a PowerPoint presentation

To do:

- Participants indicate what they see in the image

Experience

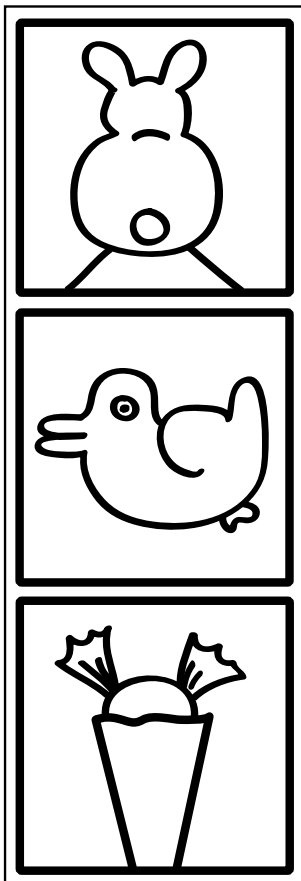
Participants experience interpreting images in different ways.

Explanation

Based on colour, shape and experience, participants indicate the meaning they associate with what they see in the pictures

Material for this test is on the free download, under number 2.8.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Recognition Test 2.9

Title: What do you see?

Brief description: Indicate what you see in the picture

Number of participants: Unlimited

Duration: 5-10 minutes

Required:

- Exercise can be integrated into a PowerPoint presentation or provided on paper
- Copies/slides of various images

To do:

- Participants indicate what they see on the image

Experience

An image can be given different meanings.

Images/drawings used:

- Incomplete drawing of a seal or the head of a donkey
- Text on a sign: "Out for the day"
- Picture of a Dalmatian

Explanation

We can often still recognise the entire picture, even if lines are interrupted. This is almost impossible for some people who suffer from CVI.

Material for this test is on the free download, under number 2.9.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Recognition Test 2.10

Title: Chinese

Brief description: Which picture matches the Chinese word?

Number of participants: Unlimited

Duration: 15-20 minutes

Required:

- Slide with words in Chinese, without a translation
- Slide with words in Chinese, with a translation
- Print worksheet for assignment with pictures of Chinese words
- Pencil

To do:

- Participants look at slide 1 with the Chinese symbols
- Participants look at slide 2 with the same symbols and translations for no more than 10 seconds
- Worksheets are handed out and participants complete the assignment
- Assignment: connect the picture with the correct Chinese word
- Slide 4 shows the correct answers

Experience

You see symbols you cannot provide meaning for, so completing this assignment is impossible.

Explanation

It is difficult to imagine not being able to associate meaning with what you see. For people with shape recognition problems, a letter from our alphabet may look like what a Chinese symbol looks like to us; a combination of lines that has no meaning to you. Even if you looked at this symbol for minutes, you will most likely not be able to reproduce it 10 minutes later, whereas someone who can read Chinese would be able to. People with severe recognition problems may see the rest of the world in the same way.

Material for this test is on the free download, under number 2.10.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

chinees	nederlands		
我	ik		
月球	maan		
魚	vis		
很	sok		
筆	pen		
肚	buik		
自	aan		
上升	roos		

Recognition Test 2.11

Title: Can you read this?

Brief description: 2 different types of text:

Text 1: a few letters have been replaced by numbers

Text 2: letter order is incorrect

Number of participants: Unlimited

Duration: 10 minutes

Required:

- PowerPoint with phrases or paper hand-outs
- Pen/pencil for participants

To do:

- Have participants read the sentences out loud or write them down correctly

Experience

Despite the fact that sentences contain numbers instead of letters, or that the letter order is wrong, most people can read the sentences without much difficulty.

Explanation

For text 1: Our brains are capable of recognising patterns and quickly replacing numbers with letters, allowing us to read a logical sentence.

For text 2: If the first and last letters are in the right place, we can usually read most words. We do not read words letter by letter; we recognise them as a whole. This apparently also works if the middle letters are in the wrong order.

Material for this test is on the free download, under number 2.11.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

Zin 1:

7H15 M355463 53RV35 70 PR0V3 H0W 0UR MIND5 C4N D0 4M4Z1N6
7H1N65! 1MPR3551V3 7H1N65! 1N 7H3 B361NNING 17 W45 H4RD BU7
N0W, 0N 7H15 L1N3 Y0UR M1ND 15 R34D1N6 17 4U70M471C411Y W17H
0UT 3V3N 7H1NK1N6 4B0U7 17, B3 PR0UD! 0N1Y C34R741N P30PL3 C4N
R34D 7H15. R3 P057 1F U C4N

Zin 2:

Het mkaat hamelael netis uit in wlkee vlogodre de ltteers in de wrodeon saatn. Het is aeleln niodg dat de eretse en de ltaatse ltteer van het wrood op de jjutse patals saatn. De rset van de ltteers mgoen wlelikueirg gpletaast wdoren en je knut tcoh nog gwoeon lzeen wat er saatt.

Section 3 Visual attention and selection

Visual attention and selection Test 3.1

Title: Pencil trick

Brief description: Focus visual attention on a table with materials, change something about your appearance

Number of participants: 5 to 10

Duration: 5 minutes

Required:

- 10 coloured pencils and two spare pencils
- Rubber and pencil sharpener
- Table
- Scarf

To do:

- Put on a scarf without anyone seeing
- Ask the participants in front of you to pay close attention to the table
- Put the 10 pencils, rubber and pencil sharpener down in a specific order
- Ask everyone to close their eyes and count to 10. Take off the scarf and make some noise with the spare pencils, leaving the other pencils in the same order
- Ask everyone to open their eyes and say what has changed
- The scarf is gone, the materials on the table have not been moved

Experience

People will tend to indicate a small change on the table or in the pencils, because they expect that, and they tend not to notice the fact that the scarf is gone.

Explanation

By focusing the participants' attention on the materials on the table, they do not notice changes in the environment.



Visual attention and selection Test 3.2

Title: Selective attention videos

Brief description: Various videos are available online demonstrating that nobody is capable of seeing everything at once

Number of participants: Unlimited

Duration: 5 minutes

Required:

- Surprising studies of visual awareness CD-ROM, available from "Viscog Productions, Inc." or find video material online

To do:

- Look for a suitable video online (e.g. YouTube) using the following keywords: (in) "attentional blindness", "selective attention test", "choice blindness" or "test your awareness". A well-known video is "the invisible gorilla" (which is also on the above-mentioned CD)
- Show the video
- Next, ask whether anyone noticed anything
- Show the video again

Experience

By giving people an assignment, they focus their attention, leading them to miss other aspects. With the invisible gorilla, for example, you count the number of times the ball is passed, and miss the gorilla.

Explanation

Selective attention is focusing sensory perception on one source and paying special attention to it, while ignoring other characteristics. We experience far less of our visual world than we think. We assume that visually noticeable or unusual objects will attract attention, but this is not always the case.



Visual attention and selection Test 3.3

Title: Changing water jug

Brief description: During a plenary presentation, change the water jug during the break and ask whether anything changed.

Number of participants: Unlimited

Duration: 5 minutes

Required:

- Two different water jugs

To do:

- Place one water jug on the table before the break, exchange it for a different one during the break.

Experience

The attention people focus on you and the presentation means they do not notice the detail of a replaced water jug.

Explanation

Noticing changes is difficult if your attention is focused on something else.



Visual attention and selection Test 3.4

Title: Group attention test

Brief description: Can you see what has changed in another person's appearance?

Number of participants: At least 10

Duration: 10 minutes

Required:

- A few accessories or items of clothing (watch, jewellery, scarf, glasses, etc.)

To do:

- Divide the participants into 2 (or more) groups
- Have the groups stand across from each other and observe each other closely. They can use some of the clothing or accessories
- One group leaves the room and makes a few changes to their clothing, exchanges things with someone else, or changes a watch to a different wrist, for example
- Have the groups meet each other again, and see if the second group can see what has changed
- Then reverse the roles
- Repeating this test with a longer interval (a few hours) between the first and the second observation can also be interesting

Experience

You may find that you are not as attentive as you might think, and fail to notice some things. Does the amount of time between observations matter?

Explanation

It is impossible to consciously observe everything around you. We select what we consciously want to see. That is often what we remember.



Visual attention and selection Test 3.5

Title: Multitasking

Brief description: Can you perfectly solve a puzzle while flawlessly passing an auditory test?

Number of participants: Depends on how the audio is presented (with or without amplification)

Duration: 10 minutes

Required:

- Audio equipment that fits in with the presentation method
- Complex audio fragment, for example the Hungarian song "M-a cerut". Count how many times the word Feta or Fata occurs in the song beforehand
- Brain trainer with letters

To do:

- Give the participants the following assignment:
- Count how many times you hear the word Feta or Fata in the song
- Do this while trying to solve a brain trainer as quickly and well as possible

Experience

Multi-tasking is harder than you think!

Explanation

It is quite possible to do things at the same time if a lot of the things you do are routine. When doing something you do not have a lot of experience with, it is very difficult to combine with something else. The more activities your brain performs that require optimal attention, the worse you will perform each of them.

Material for this test is on the free download, under number 3.5.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

The Hungarian song is available via this link: https://www.youtube.com/watch?v=58Ceky_KG6c or search for: "Irina Loghin si Fuego M-a cerut si m-a cerut". You can also use a different song.

Woordparen zoeken

Welke drie woorden kunt u maken van deze zes woorden?

A. tuin **B.** bots **C.** looper

D. dieren **E.** zand **F.** auto

Section 4 Estimating speed, depth, distance and movement

Estimating speed, depth, distance and movement Test 4.1

Title: Goals

Brief description: That referee is wrong!

Number of participants: Unlimited

Duration: 10 minutes

Required:

- Create video clips of goal attempts on a football field
- Pen and paper if needed

To do:

- Show the video clip, stopping it just before the ball reaches the goal (play it in slow motion if you wish)
- Ask the participants whether or not the ball will go into the goal
- Show images of the entire attempt before asking for the answer

Experience

You will find that it is very difficult to estimate whether or not the ball will go in.

Explanation

When you do not have enough visual information to estimate depth, it is more difficult to see whether the ball will make it into the goal or not.

After realising this, you may be a little less critical of (line) referees in the future. They can't see everything either, just like us!



Estimating speed, depth, distance and movement Test 4.2

Title: Arcs

Brief description: Compare the size of the arcs

Number of participants: Unlimited

Duration: 5-15 minutes

Required:

- Scissors
- A red sheet of A4 size paper
- A blue sheet of A4 size paper
- Pen, pencil or marker
- Sheet with 2 arcs

To do:

- There are 2 arcs on the sheet. Which arc is the largest?
- Trace the arcs, the top arc on a blue sheet and the bottom one on a red sheet of paper. Cut them out
- Place the arcs one above the other, with the convex side the same way up; the blue one on top. Which one seems largest?
- Now put the red one on top
- Which one seems largest now?
- Turn one of the arcs around, so they are both facing each other
- Which one seems largest now?
- Place both arcs on top of each other

Experience

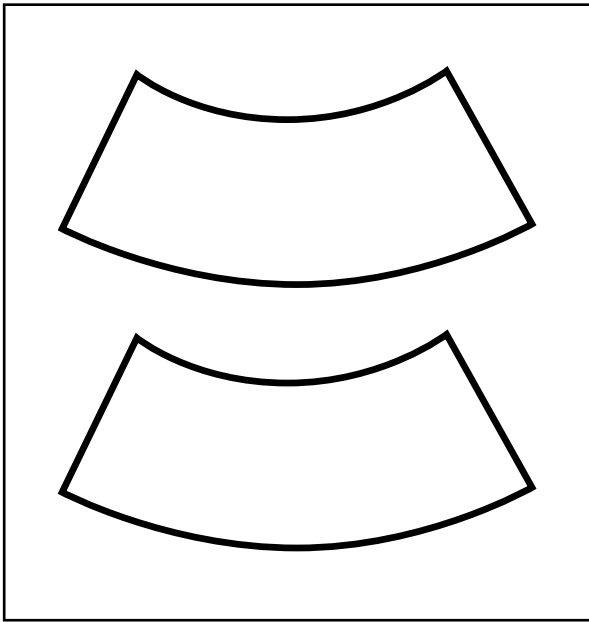
The arcs do not always appear to be the same size. If you place them one above the other with the convex side in the same direction, the lower arc will appear larger. If you swap them around, the other one will appear larger. Our brains can fool us like that!

Explanation

Why is it that one arc looks bigger than the other one? Each arc has an inner and an outer curve. Your brain thinks both curves are the same length. After all, they are part of the same arc. But the inner curve is shorter, of course. Placing the inner curve of the first arc against the outer curve of the second arc makes the second arc appear larger.

Material for this test is on the free download, under number 4.2.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Estimating speed, depth, distance and movement Test 4.3

Title: Tables

Brief description: Compare the size of two tables

Number of participants: Unlimited

Duration: 10 minutes

Required:

- Scissors
- Pen, pencil or marker
- Sheet with 2 tables

To do:

- There are drawings of 2 tables on the sheet. Are these 2 tables the same size and shape?
- Trace the table surface (not the legs) and cut it out. Place the table tops on top of each other. Can you see which one is bigger?

Experience

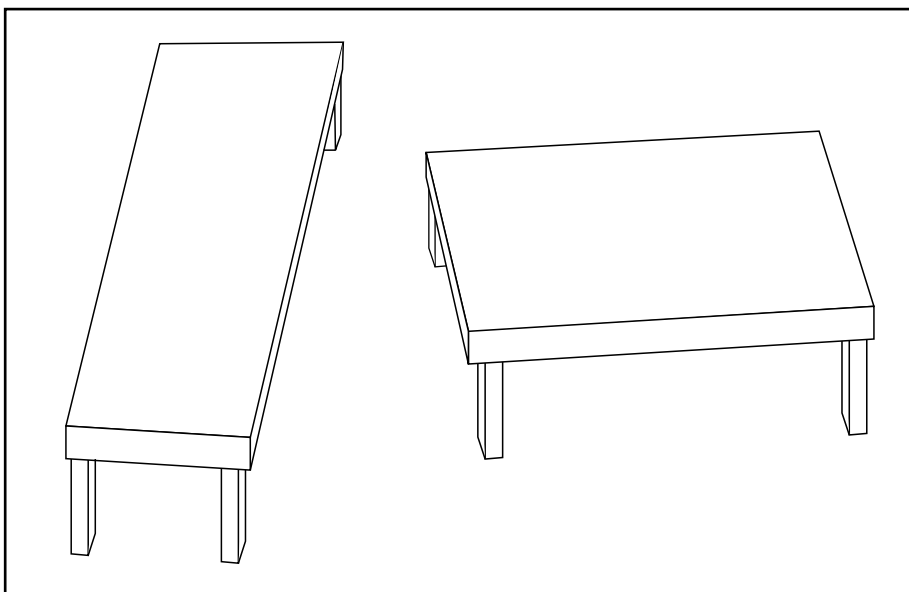
Both tables have the same dimensions and shape although one table looks longer.

Explanation

Strangely enough, both tables are exactly the same shape and size. The illusion is caused by the way the legs and sides of the table are drawn. If you look at the tables without legs and sides, it is much easier to see they are identical.

Material for this test is on the free download, under number 4.3.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Estimating speed, depth, distance and movement Test 4.4

Title: Amis's room

Brief description: Recreate Amis's room

Number of participants: Unlimited

Duration: about 60 minutes if you want to recreate the room (try this yourself first) and 5 minutes per person for viewing the room

Required:

- Scissors
- Pen, pencil or marker
- Paper with the construction kit for the room
- Photocopier to enlarge the floor plan
- Cardboard to support the room
- Stick (cocktail stick or tongue depressor)
- Little paper doll

To do:

- Enlarge the floor plan, for example using a photocopier
- Cut it out and stick all parts together
- Reinforce it using cardboard if necessary
- Create a peep hole as indicated on the front
- Provide enough room at the back near the bottom, so a paper doll on a stick can move along the back
- Make a paper puppet and attach it to a stick
- Have the puppet move from left to right and back again

Experience

You will notice it appears as if the puppet is getting bigger/smaller.

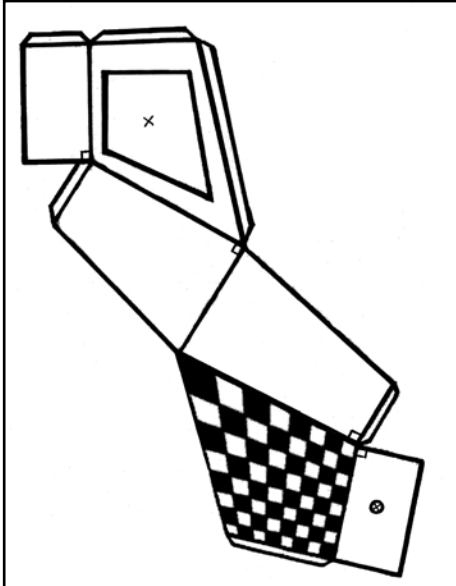
Explanation

It looks as if the room has a regular, rectangular shape, but the room is deeper at one end than it is at the other. Looking through a small hole prevents your brain from receiving enough information about the shape of the room and interpreting forward movements like the puppet getting bigger.

Material for this test is on the free download, under number 4.4.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

Using the search term Amis room you can also find videos online (YouTube).



Estimating speed, depth, distance and movement Test 4.5

Title: Froggie

Brief description: Put Froggie together and you will get your own three-dimensional illusion

Number of participants: Unlimited

Duration: 15 minutes per participant

Required:

- Froggie copied on cardboard

To do:

- Follow the instructions on the sheet of paper
- Look at Froggie at eye level with one eye closed
- Make sure you see Froggie's head come forward (so you are looking 'on top of' it)
- Once you've managed that, and you move your own head, you will see Froggie move his head too.

It takes some practice (for yourself) to experience this! There are videos online that show the effect it has

Experience

By doing so, you fool yourself and think you see Froggie's head move, although it is actually not moving.

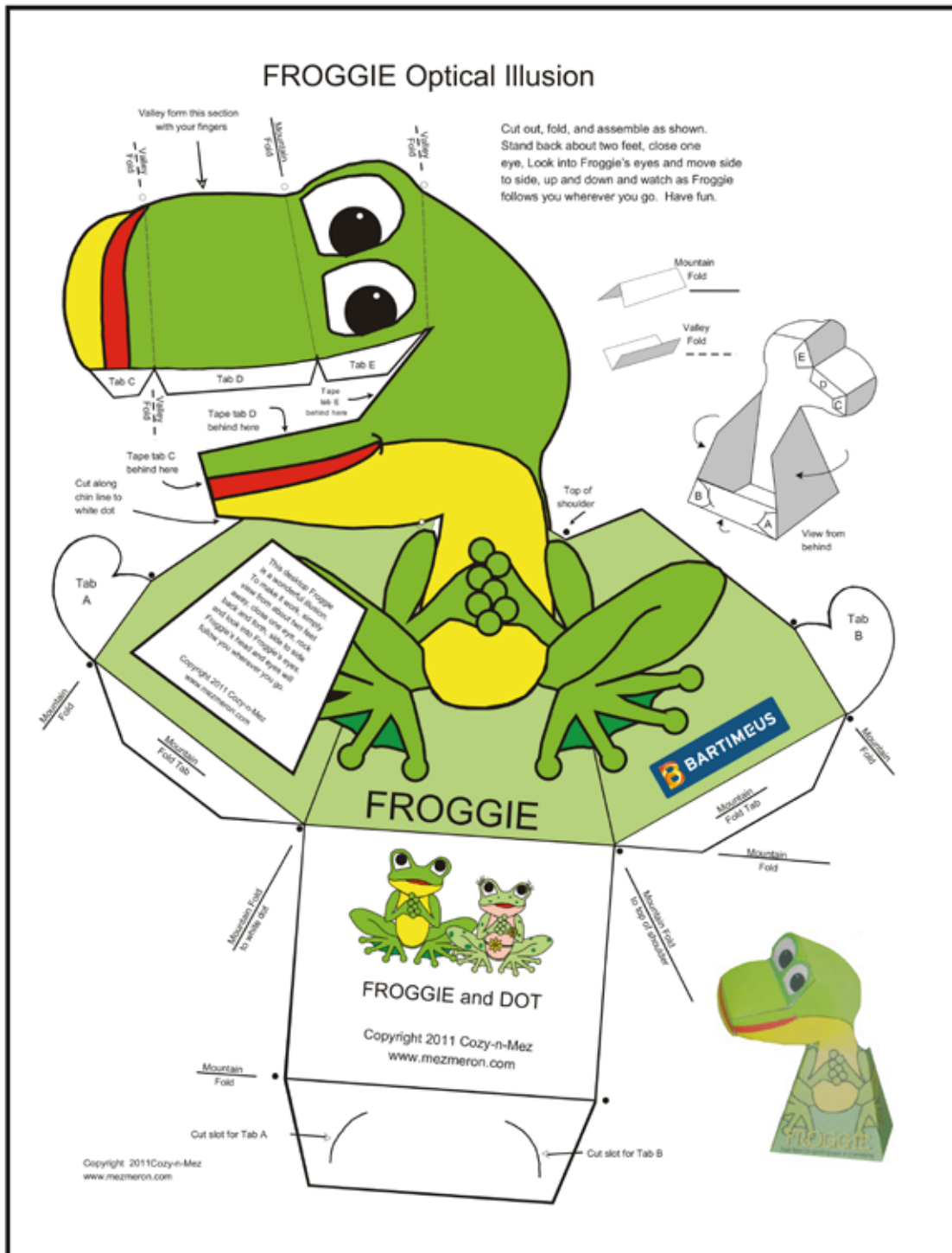
Explanation

Receiving little or no confusing information about depth enables you to get a unique sensation.

Material for this test is on the free download, under number 4.5.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

The search terms "3D paper illusion", "amazing dragon illusion solved", "Robodog froggie", "robotdog paper illusion" will result in video material with Froggie or similar illusions.



Estimating speed, depth, distance and movement Test 4.6

Title: Videos

Brief description: Various videos about depth, size and movement

Number of participants: Unlimited

Duration: 10 minutes

Required:

- Video material from the internet

To do:

- Show the participants the video clips

Experience and explanation

You will notice it is very difficult to estimate size, depth and movement if you receive little or misleading information.

The search terms "impossible motion illusion", "X-Room illusion", "Crazy Mugs Illusion!" will result in fun, illustrative videos online (YouTube).



Section 5 Visually guided locomotion

Visually guided locomotion Test 5.1

Title: Mirror test

Brief description: Can you draw something while only seeing a mirror image?

Number of participants: Depends on the number of mirror tests

Duration: Each participant will take about 10 minutes

This does not include the time required to create the mirror test

Required:

- Mirror test made based on photograph on the CD.
- Mazes or symbols to copy
- Pencil, pen or marker

To do:

- Sit in front of the mirror test with it placed on the table
- Place an assignment sheet on the horizontal part of the test
- Sit down so you can only see the assignment sheet via the mirror
- Copy the symbols or complete the maze

Experience

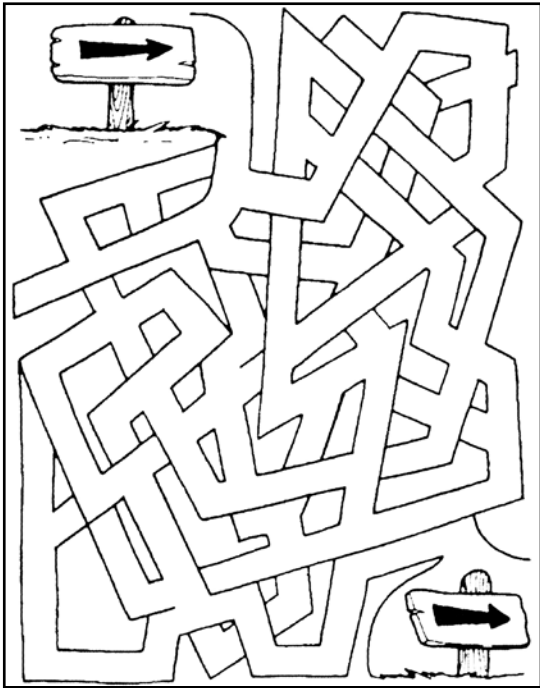
Guiding your hand is very difficult if you only have mirrored visual feedback. Some sections are easier than others. You will find that you sometimes 'zigzagged'.

Explanation

Even though you know you are looking in a mirror, it is still difficult to guide your hand. Eye-hand coordination is based on past experience. If the input is different from what your brain expects, you get confused.

Material for this test is on the free download, under number 5.1.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Visually guided locomotion Test 5.2

Title: Confused foot

Brief description: Draw a clockwise circle with your foot and draw a 6 with the hand on the same side of your body

Number of participants: Unlimited

Duration: 5 minutes

Required:

- Chair

To do:

- Sit on a chair
- Lift your right foot off the ground (if you are right-handed) and make clockwise circles with it
- Keep making clockwise circles with your right foot and in the meantime draw a 6 in the air with your right hand. Start at the tip of the 6
- If you are left-handed, do this with your left foot and left hand

Experience

Your foot will spontaneously change direction and make counter-clockwise circles. And you thought you were in charge of your own body! This test confuses the body. Your foot no longer does what you want it to.

Explanation

It is difficult for limbs at the same side of the body to make rotation movements in opposite directions at the same time. And that's what happens when you try it out. Your foot makes clockwise circles. But your hand moves counter-clockwise to write a 6. Your right foot gets confused and starts turning in the same direction as your right hand. People with CVI often have difficulties making visually guided movements.



Visually guided locomotion Test 5.3

Title: Movement in space

Brief description: Move around in a space while wearing strong prismatic or positive or negative corrective glasses

Number of participants: As many participants as there are glasses

Duration: 15 minutes

Required:

- A track (preferably unknown with unexpected changes in elevation)
- Chairs
- Balls
- Glasses:

You can stick prismatic adhesive foil (preferably 40 dioptre) on both lenses (e.g. Fresnel prisms). Sometimes you can get used glasses (with strong positive or negative correction lenses or strong prisms) via companies that prescribe them (e.g. low vision companies).

To do:

- Have participants follow the track wearing the glasses
- Have participants kick and/or catch a ball wearing the glasses
- Have participants shake hands with each other while both wearing prismatic glasses
- During the exercises, participants should swap glasses regularly; many people adjust quickly to changing circumstances
- Have the participants sit on chairs with different heights

Experience

You will find it is very difficult to estimate changes in elevation, distance, etc. if you do not receive good visual information.

Explanation

In order to orient yourself and to be able to move in three-dimensional space, you need good visual information. If you receive confusing visual information, it will make things more difficult. It can help to allow yourself to be guided by your gut and experience.



Section 6 Finding the way, orientation in space

Finding the way Test 6.1

Title: Where am I?

Brief description: A shopping cart moves around quickly in a large supermarket, or you cycle/walk through a maze of small streets. Can you figure out where you are in the store or the town?

Number of participants: Unlimited

Duration: 10 minutes

Required:

You need to create the video material for this test yourself. Find a cluttered supermarket or town centre with a lot of small streets. Walk, move your cart or cycle a few routes, filming the entire route from your perspective. Don't follow a logical route, and change direction regularly. Each route is a separate test. Create a map of the supermarket / town centre. Make as many maps as you do routes. On each map, mark the starting point and 4 possible finishes.

To do:

- When you have people take the test, show the film sped up and then ask them where you ended up.

Experience

This game shows the difficulties associated with planning a route in your head and knowing where you are.

Explanation

People with CVI may have difficulties finding their way. Recognising the environment and planning a route is difficult for them. This can also be a problem for participation in traffic. It is important to take this into account. Where possible, certain routes can be practised. Sometimes it helps to use colours (e.g. coloured doors) or other recognisable objects, tangible objects, and/or smells.



Finding the way Test 6.2

Title: Rush hour

Brief description: Find the right route for the red car in order to drive away.

Number of participants: 1

Duration: 3-10 min per card (depending on difficulty level)

Required:

- Game: Rush Hour Board Game (available in stores or online)
- Instructions

To do:

- Select 2-3 cards beforehand (with different difficulty levels)

Experience

Finding the right route can be tiring and sometimes frustrating. Sometimes there are so many options (stimuli) that you literally lose sight of the big picture.

Explanation

When people with CVI have difficulty recognising routes, recognition of the environment and planning a route is often difficult as well. This can also be a problem for participation in traffic. It is important to take this into account. Sometimes it helps to use colours (e.g. coloured doors) or other recognisable objects, tangible objects, and/or smells.



Finding the way Test 6.3

Title: Maze games (online or in a booklet)

Brief description: Playing online games: doing mazes and completing routes, building roads or completing mazes on paper or in a puzzle book

Number of participants: 1 for each laptop/computer or several if you use paper mazes

Duration: About 5 min per game

Required:

- Laptop or iPad or computer
- Internet connection
- Puzzle books with mazes are available online or in stores
- Games websites can be found by searching for e.g.: www.doolhofspel.nl, www.1001spellen.nl, www.Zylom.com

To do:

- Look up a website online beforehand or copy mazes on paper

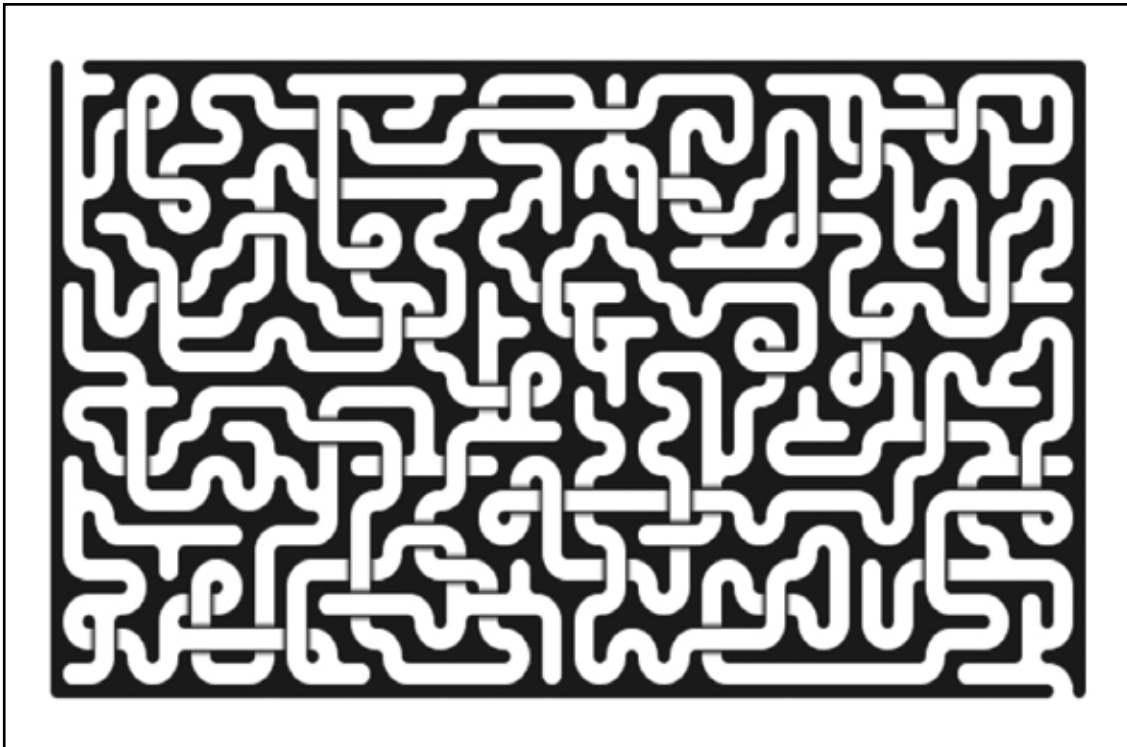
Experience

These games allow people to experience the difficulties of finding the right route and planning a route under time pressure.

Explanation

People with CVI sometimes have difficulties finding the way and planning a route to get from A to B. Consider the problems this can cause when it comes to participating in traffic. It is important to take this into account. Where possible, certain routes can be practised.

Maze games can be found on online game sites. Search for : "Labyrinth game online", "Maze game", "(Rail) Road game" or "Plumber".



Finding the way Test 6.4

Title: Follow the arrows maze

Brief description: Follow a route of arrows, if desired only with your eyes

Number of participants: Unlimited

Duration: 10 minutes

Required:

- Copy sheet

To do:

- Instructions: follow the arrow route as quickly as possible (without pointing, using only your eyes). The correct route is the one from the top arrow to the bottom arrow
- Have participants point out the route with their fingers afterwards

Experience

Following a route with your eyes alone is often difficult for people with CVI, just like this exercise is difficult for us. You quickly lose track if you are only allowed to follow the route with your eyes. People with CVI may find this difficult. This is because there is too much information on the sheet.

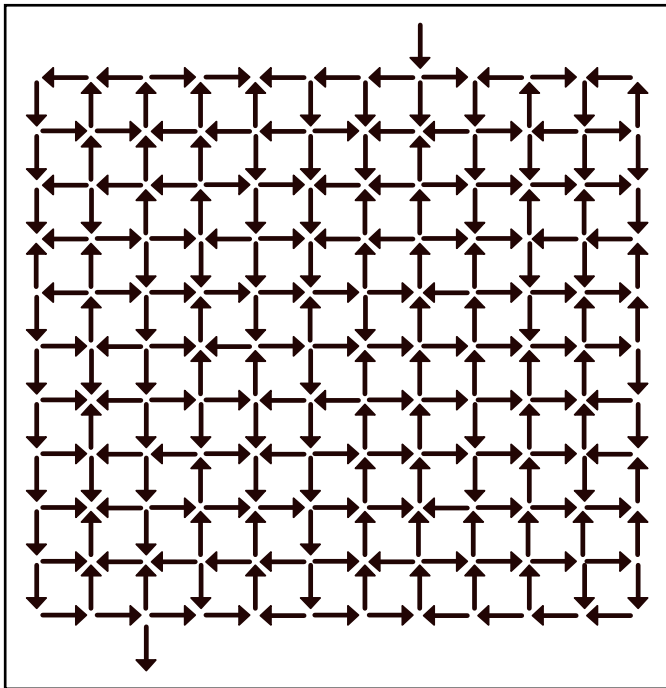
They also often have trouble finding the right direction and/or sustaining attention. It is also often difficult to follow a route using careful eye movements.

Explanation

People with CVI may have trouble with various parts of this exercise. It may be difficult to determine a route in their head and/or determine the direction and/or perform eye movements. Pointing with a finger can help. This way, it is often easier to sustain attention and direct the eyes.

Material for this test is on the free download, under number 6.4.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Section 7 Eye movements

Eye movements Test 7.1

Title: Eye movement test

Brief description: Read the numbers out loud as fast as possible, from left to right

Number of participants: Unlimited

Duration: 5 minutes

Required:

- Copy sheet; there are two kinds with different difficulty levels
- Stopwatch
- Cover sheet

To do:

- Read the sequence of numbers on the unlined sheet as quickly as possible, from left to right
- Repeat, but now with a cover sheet or pointing

Do the same thing with the easier version on lined paper

Experience

It is difficult to quickly read the irregularly printed number sequences, particularly as the gaps get larger. There is a limited horizontal frame of reference, and it takes effort not to skip down a row. Using a cover sheet makes it easier to follow the sentence. This may take effort and cause fatigue. It is also easier if there are lines between the sequences to provide direction.

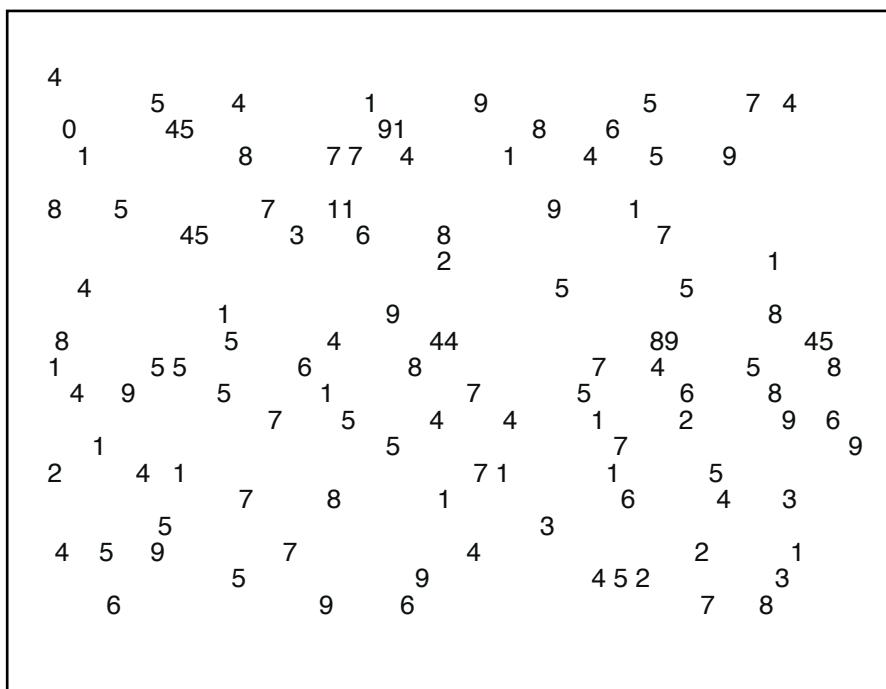
Explanation

Reading in particular, but also systematically looking for things in pictures, can be difficult for people with eye movement problems. A lower reading speed, lines that jumble or get skipped may be the result.

Eye movement disorders can also be a major problem for people who work with pictograms, a speech computer or who operate an electric wheelchair. Participation in traffic can also cause difficulties.

Material for this test is on the free download, under numbers 7.1.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Eye movements Test 7.2

Title: Dancing dolls

Brief description: Visually interpreting and following a moving object (a dancing doll in this case)

Number of participants: Unlimited

Duration: 5 minutes

Required:

- Laptop/computer
- Video clip of rotating dancer

To do:

- Show the video

Experience

Most people will see the dancer rotate clockwise. But by looking closely or focusing slightly below or next to the dancer, you can see her change direction. This is actually possible! You can see the dancer turning both directions! Some people suggest looking just above the computer screen, so not directly at the dancer. Keep trying, because you will be amazed when you succeed.

Explanation

The explanation lies in the fact that any silhouette can be interpreted or seen in several different ways. This is because our brain tries to turn the image into a three-dimensional one. The brains automatically adds a third dimension (depth) to a flat (two-dimensional) image. After all, we live in a three-dimensional world, and our brain tries to maintain that, even if this means twisting reality. That is precisely what happens here. A dancing doll can only move in three dimensional space, after all.

Video clips for this test can be found online (YouTube), for example by searching for: "optical illusions" "spinning woman!", "solution for spinning dancer girl illusion defined for both directions", "watch her dance! optical illusion", "Dancer Optical illusion"



Eye movements Test 7.3

Title: Line game

Brief description: Follow the lines using only your eyes

Number of participants: Unlimited

Duration: 2 minutes

Required:

- Copy sheet
- Stopwatch if desired
- Pen and paper to note the results

To do:

- Instruct participants to connect the letters with the right number as quickly as possible, only using their eyes
- Record time using the stopwatch if desired

Experience

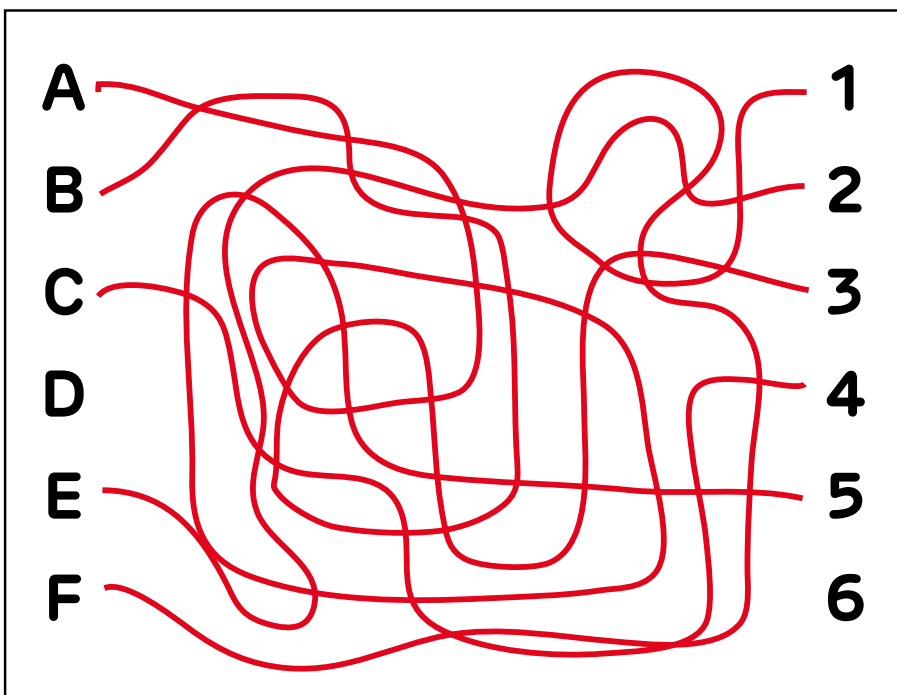
Following the lines demands effort and concentration.

Explanation

We unconsciously track many things with our eyes in daily life. For example, to read sentences, we need to move our eyes along the lines of the sentence and, when we reach the end of the sentence, jump quickly to the beginning of the next sentence. Other examples are games (ball games).

Material for this test is on the free download, under number 7.3.

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>



Test reaction time

Title: Human snake reaction time

Brief description: Transmit a signal to each other and see how long it takes

Number of participants: At least 10

Duration: 10 minutes

Required:

- Stopwatch

To do:

- Stand in a long line with a large group and hold on to each other's ankles. The participants have their eyes closed
- Give the last person in line a squeeze in the ankle. This person passes it on
- When the first person in line feels something, he calls out and the leader records the time with a stopwatch
- Do the same thing while you hold on to each other's shoulder and squeeze it. Do this with eyes closed as well

Experience

You will find that passing along a signal given in the shoulder is faster than passing along one given in the ankle.

Explanation

Your shoulder is closer to your brain, allowing the participants to respond faster. In people with CVI, parts of the brain are damaged or improperly developed, so they do not function properly. The function that part of the brain has is limited or completely absent. Because the brain has a certain degree of plasticity, other parts of the brain may take over these functions. The information often travels along a different route in this case. Consider this roadblock that requires a detour. You arrive at your destination, but it takes longer, because you've taken the long way around. People with CVI may be able to do certain things, but need more time for them.

ANSWER SHEET FOR THE DUTCH VERSION:

1.1 Crowding

1.4 rabbit and goat

1.6 Langs de koele kali liep een kale koeli met een kilo kali op zijn kale koeli-kop

Als ik die wolken na tuur beleeft zij zo een nat uur in de natuur.

Vissende vissers die vissen naar vissen, maar vissende vissers die vangen vaak bot. De vis waar de vissende vissers naar vissen vindt vissende vissers vervelend en rot.

Zeven Zaventemse zotten zullen zes zomerse zondagen zwemmen zonder zwembroek. Zware

Julien zijn zuster zaliger zei: "Zo'n zeveraars! Ze zijn zijle zeker zot zeg! Ze zullen zinken!

Wij smachten naar achtentachtig prachtige nachten bij achtentachtig prachtige grachten.

Bram de brave broer van breiende brauwende Brielse Brechtje, bracht in zijn bronsbruin broekje een bril en een brandbrief en een gebroken brokje bros bruin brood over de brede brug naar Breukelen.

Kapper Knap, de knappe kapper, knipt en kapt heel knap, maar de knecht van kapper Knap, de knappe kapper, knipt en kapt nog knapper dan kapper Knap, de knappe kapper.

Wat een weer weer.

Je waait haast van de weg weg. Je kunt beter in het magazijn zijn, met een doosje aardbeien bij je.

Klappertandend kwam Kees Koukleum kolen kopen. Kijk kijk, kakelde kolenkoopman Kuipers.

Kees klappertandt! Koud, Kees? Kerel, klaagde Kees. Krakende knieën, klapperende kiezen, compleet knikkende kuiten. Curieuze kou, knikte Kuipers. Koop kolen, knul! Kolen kunnen kou klein krijgen!

Roverovervallen vallen overal voor. Het valt voor dat bij een roveroverval een rover voorover over een roverval valt. Maar een rover heeft het er wel voor over om bij een roveroverval voorover over een roverval te vallen. Want voor een rover schiet er bij een roveroverval altijd wel wat over!

Er schreed een snip over 't schip, die sneed met zijn bek 't spek van 't spit. Wie zag er ooit een snip schrijden en met zijn bek 't spek van 't spit snijden, zoals deze snip deed, die over het schip schreed en met zijn bek 't spek van 't spit sneed.

De postkoetskoetsier poetst de postkoets met postkoetspoets op een postkoetspoetsdoek.

De boer die had een kalf en de moeder van de boer was ook de vader van het kalf.

Er waren eens twee nachtwachten, een voor-middernacht-nachtwacht en een na-middernacht-nachtwacht.

De voor-middernacht-nachtwacht zei tegen de na-middernacht-nachtwacht:

"Als jij de voor-middernacht-nachtwacht waakt, waak ik de na-middernacht-nachtwacht."

"oke" zei de na-middernacht-nachtwacht tegen de voor-middernacht-nachtwacht

"Ik waak de voor-middernacht-nachtwacht en dan waak jij de na-middernacht-nachtwacht."

Zo kwam het dat de voor-middernacht-nachtwacht de na-middernacht-nachtwacht waakte en de na-middernacht-nachtwacht de voor-middernacht-nachtwacht waakte.

2.1 12, 13, 24

2.4 Obama, Pope, Elvis, Princess Beatrix of the Netherlands, Geert Wilders of the Netherlands, Justin Bieber, Michael Jackson, Johan Cruyf of the Netherlands, Mark Rutte Prime-Minister of the Netherlands

2.5 They all have the same face

2.6 The face is in the bottom

2.8 Rabbit and head of a dog, rabbit and duck, ice cream and duck diving into something with his head

2.9 liar, a Dalmatian, seals horse

2.11 This message serves to prove how our mind can do amazing things! Impressive things! In the beginning it was hard but now, on this line your mind is reading it automatically without even thinking about it, be proud! Only certain people can read this. Re-post if you can.

Het maakt helemaal niet uit in welke volgorde de letters in de woorden staan. Het is alleen nodig dat de eerste en de laatste letter van het woord op de juiste plaats staan. De rest van de letters mogen willekeurig geplaatst worden en je kunt nog gewoon lezen wat er staat.

6.4 Answer is on the free download

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

ANSWERS FOR THE ENGLISH VERSION

Answer sheet:

1.1 Crowding

1.4 rabbit and goat

1.6 Peter Piper picked a peck of pickled peppers. A peck of pickled peppers Peter Piper picked. If Peter Piper picked a peck of pickled peppers, Where's the peck of pickled peppers Peter Piper picked?

I saw Susie sitting in a shoe shine shop. Where she sits she shines, and where she shines she sits.

Denise sees the fleece, Denise sees the fleas. At least Denise could sneeze and feed and freeze the fleas.

Something in a thirty-acre thorn thicket of thorns and thistles thumped and thundered threatening the three-D thoughts of Matthew the thug - although, theatrically, it was only the thirteen-thousand thistles and thorns through the underneath of his thigh that the thirty year old thug thought of that morning.

2.1 12, 13, 24

2.4 Obama, Pope, Elvis, Princess Beatrix of the Netherlands, Geert Wilders of the Netherlands, Justin Bieber, Michael Jackson, Johan Cruyff of the Netherlands, Mark Rutte Prime-Minister of the Netherlands

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2.9 liar, a Dalmatian, seals horse

2.11 This message serves to prove how our mind can do amazing things! Impressive things! In the beginning it was hard but now, on this line your mind is reading it automatically without even thinking about it, be proud! Only certain people can read this. Re-post if you can.

I couldn't believe that I could actually understand what I was reading: the phenomenal power of the human mind. According to a research team at Cambridge University, it doesn't matter in what order the letters in a word are, the only important thing is that the first and last letter be in the right place. The rest can be a total mess and you can still read it without a problem. This is because the human mind does not read every letter by itself, but the word as a whole. Such a condition is appropriately called Typoglycemia.

"Amazing, huh? Yeah and you always thought spelling was important.

6.4 Answer is on the free download

<https://www.webedu.nl/downloads/Bartimeus/download%20CVI%20Experience.zip>

EPILOGUE

CVI is a complex diagnosis with a variety of forms. The desire expressed by many parents and partners to see the world through the eyes of their child or partner is not easily fulfilled. CVI Experience tries to allow people to experience the complexity of visual processing. This knowledge and experience ensures greater empathy and understanding among everyone involved with people with CVI.

The material for CVI Experience has been used within Bartiméus for internal and external education programmes about CVI. Questionnaires were used to measure effectiveness. The goal of these measurements was to determine to what degree the simulation tests contribute to a better understanding of various forms of CVI and how to approach people with CVI. At the time of writing, the results of these measurements are being processed.

CVI Experience is not a finalised method. Working with the material frequently reveals new tests or videos that can also contribute to understanding the visual processing difficulties in CVI.

Within the field of medicine, one is sometimes faced with limited options for curing and treating diseases and conditions. At the Bartiméus diagnostic centre in Zeist, we are also regularly confronted with such limitations. We often cannot help children or adults to see better. What we can do is minimise the impact of their disability. One key way to achieve this is to raise awareness among people in their surroundings in order to improve understanding of the limitations faced by children and adults with CVI in daily life. My hope is that the experiences gained via CVI Experience will contribute to this goal, and that people with CVI will be able to achieve their full potential.

Florine Pilon