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Normative Data for Motor Free Visual Perception Test- 4 In Indian Population Between 50-60 Years in Normal Healthy Individuals

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Abstract

Visual perceptual skills are critical for performing various tasks, making them a key focus in Occupational Therapy, particularly across different diagnoses. The Motor-Free Visual Perception Test (MVPT-4) is a standardized tool used to evaluate visual perception independent of motor abilities in individuals aged 4 to 80+. Although MVPT-4 has been widely used across diverse populations, normative data for adults, especially in the Indian population, is limited. This study aims to establish normative data for healthy North Indian adults aged 50-60.

A total of 100 individuals (50 males, 50 females) were assessed using MVPT-4. Test scores were recorded, and statistical analysis was performed. Results indicated an average score of 27.2 (SD = 7.31) in females and 29.32 (SD = 7.45) in males. These findings contribute to a deeper understanding of visual perceptual abilities in the Indian population and provide normative data for future research and clinical practice in the region.

Keywords: Visual perception, MVPT-4, Occupational Therapy, normative data, North Indian adults, visual-perceptual assessment, motor-free

1. Introduction

Visual perceptual skills are important building blocks for performance of various human task and roles. Visual perceptual disorders in adults can result in limitations of one or several of the skill sets in various contexts. This can be a result of any neurological damage from either injury or illness to the brain. This could include traumatic or anoxic brain injury, stroke, encephalopathy, multiple sclerosis, brain tumor, and dementia. Occupational therapists who work with older adults will eventually interact with these conditions. Thus, it's crucial for OTs to readily identify potential visual perceptual problems that can interfere with their patients' participation inside and outside of regular therapy services. Therefore a test to assess visual perceptual skills in cases with associated motor deficits is significant.

The Motor-Free Visual Perception Test (**MVPT**) is a widely used, standardized test of visual perception for the purpose to **assess** visual perception independent of motor ability. It was originally developed for use with children (Colarusso & Hammill, 1972); however it has been used extensively with adults.

The MVPT-4 is the most recent revision of the only non-motor visual perceptual assessment that can be used throughout the lifespan. The MVPT-4 provides a quick, reliable, and valid measure of overall

visual perceptual ability in children and adults. Stimuli are black-and-white line drawings and designs, with answer choices presented in an easy to record multiple-choice format. Test takers respond by pointing, making the test particularly useful with those who may have motor disabilities. The MVPT-4 is one of the most widely used visual perceptual assessments for recertifying adult drivers after head injury or stroke. The MVPT-4 can be used for screening and research purposes by psychologists, occupational therapists, educational specialists, optometrists, and others who may need to determine a person's overall ability to discern and understand visual stimuli.

The test consists of 36 items, two-dimensional; multiple choice format in a horizontal manner designed to evaluate visual perception as a whole. It measures spatial relationship, figure-ground perception, visual memory, visual closure and, visual discrimination.

Scoring

0 - Inaccurate response

1- Accurate response

Reliability and Validity:

Test-retest reliability was 0.77- 0.83 for different age groups and total test-retest reliability was 0.81.

Spearman Brown Split Half reliability was 0.81-0.84; 0.88 (for different age group and total respectively).

Kuder-Richardson reliability was 0.71 – 0.82; 0.86 (for different age group and total).

Validity:

Content validity, construct validity, discriminant validity and concurrent validity has been reported.

It has been established that there is a strong need to ensure that norms for visual perceptual test appropriate for specific cultural group being assessed. Furthermore, the influence of culture on visual perception has been reported, hence this study is undertaken to establish normative reference data for Motor-Free Visual Perception Test. (Dr.U.Ganapathy Sankar "Normative Data of Motor Free Visual Perception Test among Indian Children. ." IOSR Journal of Pharmacy (IOSRPHR), vol. 8, no. 4, 2018, pp. 67-71)

2. Aim of the Study

The aim of the study was to find out a normative data for North Indian population aged between 50-60 years in healthy individuals.

3. Methodology

100 healthy individuals 50 male and 50 female patients were administered the scale MVPT-4 and their respective scores were recorded. The study was conducted in various parts of north India, where the subjects have been selected from the general population. Before the scale was administered, the purpose of this study was explained to them and informed consent was obtained.

Instrument and Procedure:

The MVPT-4 is the most recent revision of the only non-motor visual perceptual assessment that can be used throughout the lifespan. The MVPT-4 provides a quick, reliable, and valid measure of overall visual perceptual ability in children and adults. The MVPT-4 includes 45 items from the MVPT-3 which have been reorganized and grouped for easier administration. Stimuli are comprised of black-and-white line drawings and designs, with answer choices presented in an easy to record multiple-choice format. No motor involvement is needed to make a response, making the test particularly useful with those who

may have motor disabilities. The MVPT-4 includes new norms for ages 4 through 80+ years. The MVPT-4 takes approximately 20-25 minutes to administer. Complete Kit includes the Manual, Test Plates and Recording Forms.

4. Data Analysis:

Items of the measure:

The items for the *original MVPT, MVPT-R* and *MVPT-3* are comprised of items representing 5 visual domains:

Source: Colarusso & Hammill, 1996

Visual Discrimination	The ability to discriminate dominant features in different objects; for example, the ability to discriminate position, shapes, forms, colors and letter-like positions.
Visual Figure-Ground	The ability to distinguish an object from its background.
Visual Memory	The ability to recall dominant features of one stimulus item or to remember the sequence of several items.
Visual Closure	The ability to identify incomplete figures when only fragments are presented.
Visual Spatial	The ability to orient one's body in space and to perceive the positions of objects in relation to oneself and to objects.

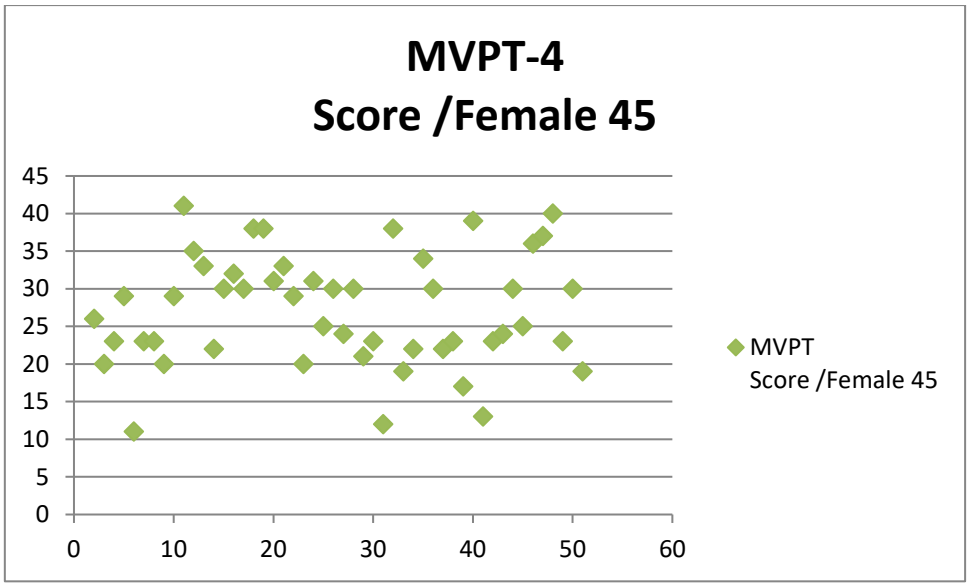
An updated and streamlined version of the classic visual perception test, the MVPT-4 is the only nonmotor visual perceptual assesment that can be used throughout the life span.

Items on MVPT-4:

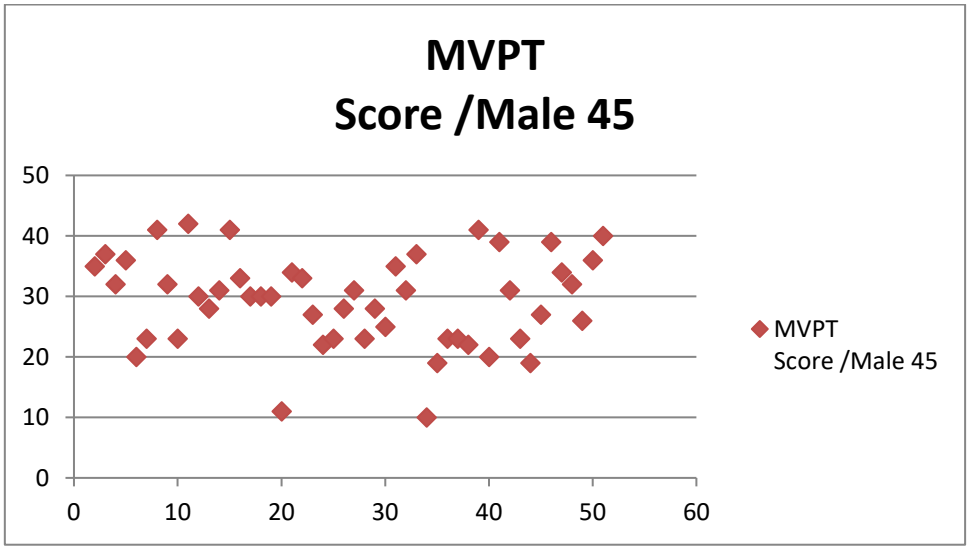
Visual Perceptual Abilities Assessed

The following tasks are assessed:

- Visual Discrimination - the ability to discriminate dominant features of different objects, including the ability to discriminate position, shapes, and forms
- Spatial Relationships - the ability to perceive the positions of objects in relation to oneself and to other objects. Items assess the perception of pictures, figures, or patterns that are disoriented in relation to each other, such as figure reversals and rotations
- Visual Memory - the ability to recognize a previously presented stimulus item after a brief interval
- Figure-Ground - the ability to distinguish an object from background or surrounding objects
- Visual Closure - the ability to perceive a whole figure when only fragments are presented.



Graph 1



Graph 2

Further the number of females and males across the different age groups (Table 2) and their average scores (Table 3) was also calculated and tabulated below. There were 23 normal females in the age group of 50-54 and 27 normal females in the 55-59 age group, and there were 25 normal males in both the 50-54 and 55-59 age groups. Their average scores have also been calculated and given in table 4.

Table 2: Number of females and males in the different age groups

Category	50	51	52	53	54	55	56	57	58	59
Females	5	5	6	6	1	9	3	2	7	6
Males	4	5	5	4	7	7	6	6	4	2

Table 3: Average score of MVPT-4 across various age groups in females and males

Category	50	51	52	53	54	55	56	57	58	59
Females	21.8	27.2	30.3	31.5	31	24.6	28.6	22.5	24.4	30.8

Males	35	27.8	34.4	30.75	25.4	30	20	26.5	32.75	38

Table 4:

Age Groups	Females	Males	Avg.score	
			Females	Males
50-54	23	25	28.37	26.18
55-59	27	25	30.67	29.45

5. Results

The mean of MVPT-4 scores for the participants was 28.22(S.D=7.50). The scores ranged from lowest of 10 to the highest of 42. Both males and females scored a minimum of 10 on MVPT-4. However, the highest score attained differed from 41 in female and 42 in male participants. The mean score in females was 27.2(S.D= 7.31) in comparison to that of males was 29.32 (S.D =7.45). Further, there were only seven individuals scoring equal to or above 40 on MVPT-4 including both females and males.

Graph 1 shows the schematic representation of the mean scores of females and Graph 2 shows the schematic representations of the mean score of males.

6. Discussion

The major outcome of the study is to find out the average performance of visual perception abilities via MVPT-4 score and standard deviation in both normal male and female between the 50-60 age group. The average score i.e. the mean in normal healthy females was 27.2(S.D= 7.31) whereas for the male population it was 29.32 (S.D =7.45). The purpose of this instrument is to provide an alternative measure of visual perception. From the results calculated it can be found that there was only one participant in the 54 year age group in the female group, 2 participants each in the 57 age group in the female group and 59 age group of the male individuals and 3 participants in the 56 age group of females. It was also found that 1 female scored the maximum, 20 females scored between 26 & 29, 24 scored between 20 & 25, 3 scored between 11 & 19 and 2 scored 10. It has been also found that there is a gradual decrease in the scoring as the age progresses which may be attributed to the fact of decreased cognitive functioning as evident from table 4. It was also found that 2 males scored the maximum, 20 males scored between 26 & 29, 24 scored between 20 & 25, 3 scored between 11 & 19 and 1 scored 10. It has been also found that there is a gradual decrease in the scoring as the age progresses which may be attributed to the fact of decreased cognitive functioning as the age increases as evident from table 4.

Typical visual perception measures include motoric responses and tasks (e.g., copying or tracing) that ultimately assess both visual and motor abilities. The MVPT-4 seeks to produce an isolated measure of visual perceptual ability independent of motoric capability. Examiners use this instrument for a variety of purposes, including the determination of visual perceptual differences across several diagnostic classifications. Occupational therapists also administer this test to determine driver recertification eligibility following strokes or head injuries. Research in this area suggests that overall visual perceptual ability relies on five interrelated processes, including spatial relationships, visual discrimination, figure-ground, visual closure, and visual memory. Skills in spatial relationships require the ability to orient oneself in space. This ability also involves the accurate perception of objects in relation to oneself and other objects. Visual discrimination requires the ability to discriminate salient object features. The ability to discriminate an object from its background is classified as figure-ground. Visual closure

involves gestalt-like ability to perceive a whole figure when fragments are missing. Lastly, visual memory involves the ability to recognize a stimulus following a brief interval. Research shows that these processes do not occur in isolation and should not be measured individually. The MVPT authors had designed their test based on this research. Items were developed to closely resemble each of these areas. As suggested, individual scores are not produced for each task type. The interrelatedness of these tasks allows only for an overall visual processing score to be produced.

The **MVPT-4** is the most recent revision of the only non-motor visual perceptual assessment that can be used throughout the lifespan.

- Provides a quick, reliable, and valid measure of overall visual perceptual ability in children and adults.
- Responses require no motor involvement, making the test particularly useful with those who may have motor disabilities.
- Assesses visual discrimination, spatial relationships, visual memory, figure–ground discrimination, and visual closure.
- Includes new norms for individuals ages 4 through 80 years.
- Results of reliability and validity studies and performance comparisions with clinical populations are provided.
- Generates one overall standard score and percentile rank.
- Designed to be used for screening and research purposes by psychologists, occupational therapists, educational specialists, optometrists, and others who may need to determine a person's overall ability to discern and understand visual stimuli.

The MVPT-4 is one of the most widely used visual perceptual assessments used by occupational therapists and driver rehabilitation specialists.

The MVPT-4 is designed to be used for screening and research purposes by psychologists, occupational therapists, educational specialists, optometrists, and others who may need to determine a person's overall ability to discern and understand visual stimuli.

7. Conclusion

In conclusion, this study examined the visual perception abilities of normal males and females aged 50-60 using the MVPT-4, focusing on average performance scores and standard deviations. The findings indicated a slight difference in the mean scores between males (29.32) and females (27.2), though both groups exhibited similar patterns of score distribution and gradual decline with age. This decline may reflect reduced cognitive functioning, which is commonly associated with aging. The MVPT-4 has proven to be a valuable tool for assessing visual perception independently of motor ability, making it particularly beneficial for individuals with motor impairments. Its wide applicability across age groups and diverse clinical settings underscores its importance in evaluating visual perceptual functions for screening, research, and rehabilitation purposes. These results reinforce the role of the MVPT-4 in identifying visual perceptual deficits and the need for further research to understand how these abilities evolve with age.

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