

STUDY OF REPEAT PERFORMANCE IN ONLINE FRANSWORTH-MUNSELL 100 HUE COLOUR VISION TEST FOR STANDARD OBSERVERS

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ABSTRACT

This paper analyzes the variation in error score for selection of standard observer in repeate performance in online fransworth-munsell 100 hue colour vision test for standard observers, and the method to avoid such problem for selection of best score standard observers for colour matching experiments.

Keywords: Hue ,Error Score, CapTest, Standard Observer.

I. INTRODUCTION

The simplest method to test the hue judgment ability of the human vision is the D15 portable test consisting of four trays containing a total of 93 caps out of which 85 are removable colour reference caps in incremental hue variation, under the visible spectrum and rest 8 are of fixed position at the both ends of each rows.

Colour vision abnormalities and aptitude for hue judgment are detected by the ability of the test subject to place the colour caps in order of hue.

The four trays are boxed in a carrying case (**Figure 1**) [1]. The test is conducted under controlled daylight conditions.



Figure 1:Fransworth-Munsell 100 Hue Colour Vision Test caps

Source: www.xrite.com/online-color-test-challenge, Date 30/05/2015, 13:40

In this line the next test is 'Fransworth-Munsell 100 Hue Colour Vision Test'. It is also known as 'Arrangement Test' which is the advance version of the D15 test. It evaluates the colour acuity of the human eyes. It is

available in the portable form and online software form. It takes about 15-20 minutes to test the standard observer. With the help of this test we can check the accuracy of our colour vision capabilities and identify the person with normal colour vision into different classes like superior, average and low colour discrimination capabilities [2]. Few examples of its use are:

1. Examination of inspectors of colour, graders, matchers and goods.
2. Testing for type and degree of colour defectiveness.
3. Detection of poor colour vision in sales people.
4. Selection of applicants for vocational training.
5. Design of specialized tests for colour vision.
6. Measurement of effects of medical treatments.
7. Independent control on validity of other colour vision tests.

II. RESEARCH METHODOLOGY

After final printing of Test Charts, the initial identification of standard observers was required [3,4]. For this, colour strips of Cyan, Magenta and Yellow were cut from the printed sheets and alternate patches were pasted on colour caps. These caps were numbered from 1 to 10 from dark to light density and same strips were pasted on a black chart and three randomly cut colour strips were prepared of each colour as shown in **Figure 2**. The different persons were asked to arrange the caps in a descending order i.e. from dark to light for each colour. The 30 persons who arranged more than 50% of each colour shade separately and accurately were considered suitable for final online Fransworth-Munsell 100 Hue Colour Vision Test for further judgment.

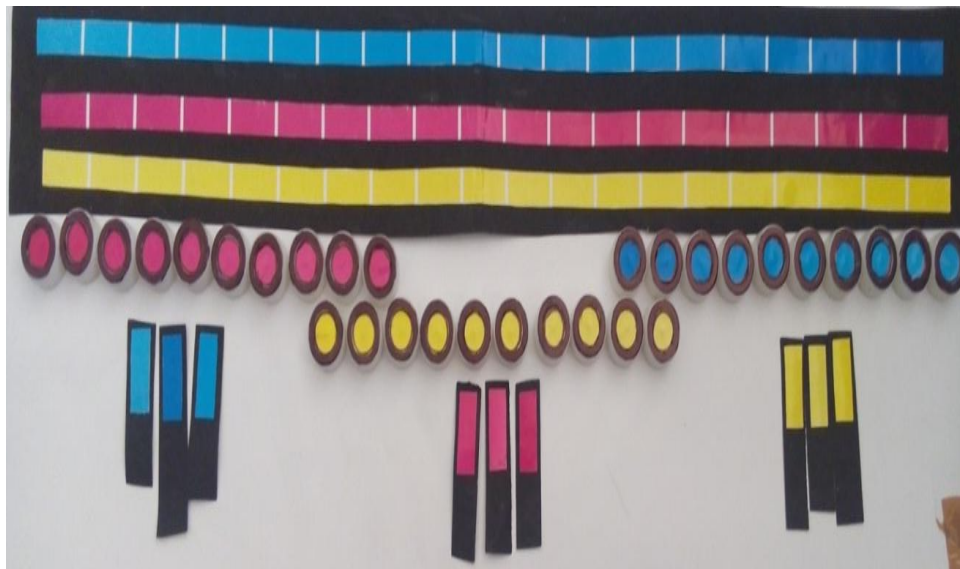


Figure 2: Cap Model Developed on The Basis of Fransworth-Munsell 100 Hue Colour Vision Test Using Actual Prints from Experiments

In online 'Fransworth-Munsell 100 Hue Colour Vision Test' the physical colour caps of D15 portable test are replaced with the four row of colour plates consisting of 88 different plates

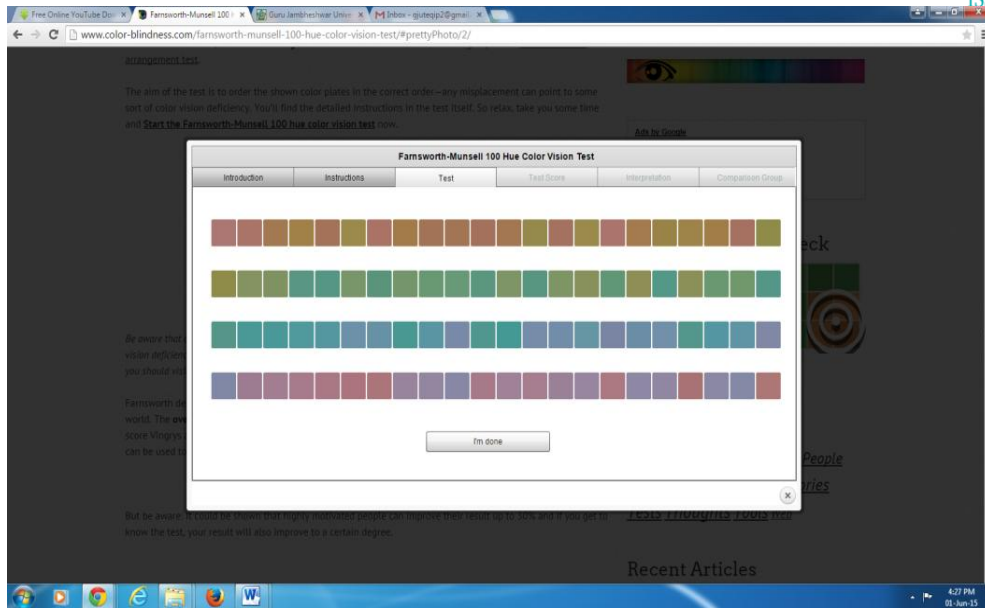


Figure 3: Online Fransworth-Munsell 100 Hue Colour Vision Test window screen shot

Source: www.color-blindness.com/farnsworth-munsell-100-hue-color-vision-test/#prettyPhoto/2/ Date 1/06/2015, 16:30

required to be arranged in above mentioned four distinct rows in which first and last plate of each row is fixed and set correctly for using it as anchor plates as shown in **Figure 3** [5].

The in-between plates are mixed randomly and the person appearing for the hue test is required to move the plates with the help of cursor in the expected order of variation and hue change. The person can re-arrange the plate at any point of confusion within the rows and after completion of the test it provides the overall error score of the individual in which the person with error score of 70 is considered with the normal colour vision.

III. DATA COLLECTION AND ANALYSIS

The following Table and Graphsshow the Scores and analysis of scoresof persons appeared for on line Fransworth-Munsell 100 Hue Colour Vision Test for Selection of Standard Observers-

Sr. No.	Gender	Error Score in I and II Attempts			Sr. No.	Gender	Error Score in I and II Attempts		
		I	II	Difference			I	II	Difference
1	M	82	75	7	16	F	74	65	9
2	M	85	66	9	17	F	35	28	7
3	M	90	82	8	18	M	71	63	8
4	M	77	67	10	19	F	77	69	8
5	F	50	48	2	20	M	45	40	5
6	F	99	91	8	21	F	75	66	9
7	F	79	70	9	22	F	46	40	6
8	F	80	71	9	23	F	70	63	7



9	M	67	62	5	24	M	81	72	9
10	M	60	60	0	25	F	51	48	3
11	F	45	40	5	25	M	85	75	10
12	F	78	62	6	27	M	77	68	7
13	F	72	67	5	28	F	35	28	7
14	M	76	70	6	29	M	65	61	4
15	M	65	60	5	30	M	52	48	4

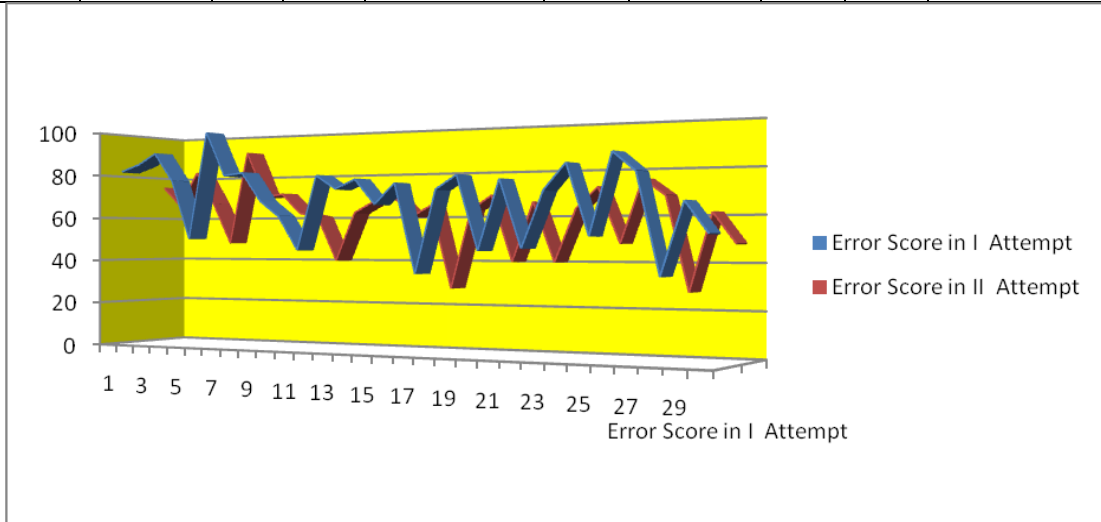


Figure 4

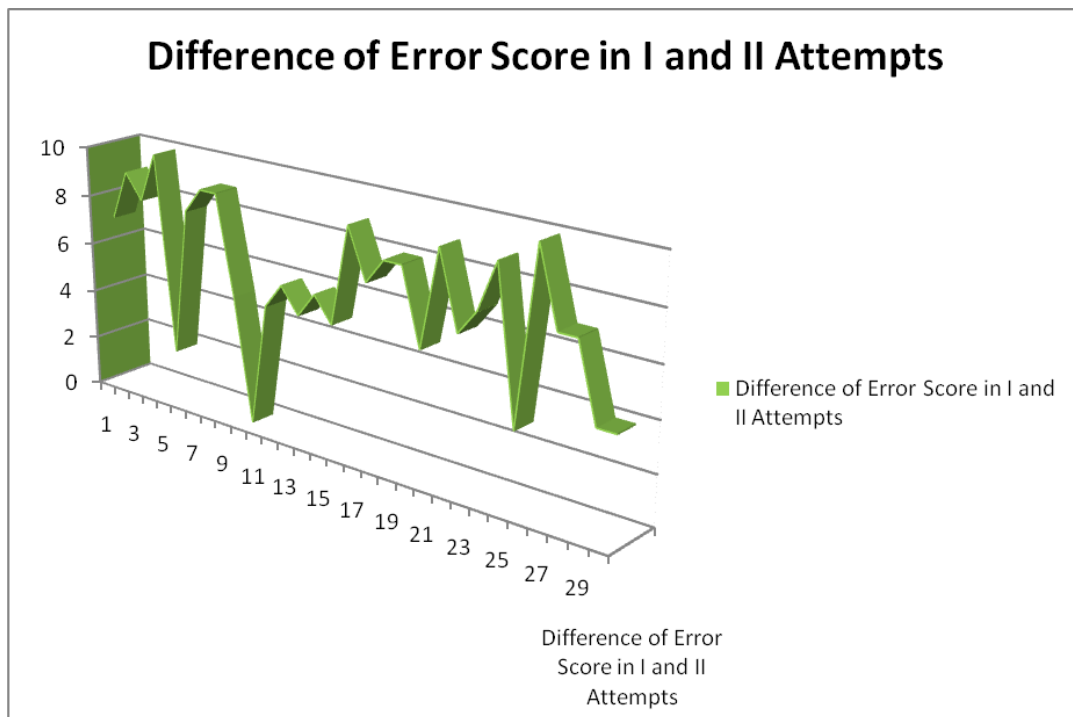


Figure 5

The first graph (Figure 4) clearly shows the considerable difference in the error scores of the persons even qualified the first phase cap test and the second graph (Figure 5) further shows the range of difference of error scores that is in between zero to ten.

IV. CONCLUSION

Therefore, during the hue test of the standard observers it is found that the difference of error score of same observer in first and second attempt of the test is around 10. Therefore the selection of Standard Observers can be made within the maximum error score of 60 and below to it by subtracting the error score of 70 by variation range in error score i.e. 10 in first and second attempt.

REFERENCES

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- [3] ASTM 0001 (No Date), ASTM E 1499 Standard guide to the selection, evaluation and training of observers.
- [4] ASTM 0003 (No Date), ASTM D 4086 Standard practice for visual evaluation of metamerism.
- [5] www.color-blindness.com/farnsworth-munsell-100-hue-color-vision-test/#prettyPhoto/2/ Date 1/06/2015, 16:30