

Color Blindness

The Enigma of Colors

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Multimedia Arts



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Summary

Colorblindness, also known as color vision deficiency, is a phenomena which is not very well understood by most people. The video highlights different aspects of this deficiency in order to create awareness and help people better understand the condition.

The video explores a whole range of dimensions including the genetic origin of the color vision deficiency and the effects this deficiency has on the lives of those who suffer from it.

This work also features some interviews of color vision deficient people to highlight the struggles of their daily lives and the challenges they face in pursuit of their dreams. Professor Saeed Akhtar, a painter par excellence and the recipient of the Presidential Award for Pride of Performance, also talks about his trials and triumphs and how he was able to carve a colorful career in an area for which colorblind people are considered unsuitable.

The documentary is an attempt to cast light on color vision deficiency and see the colors of life through the prism of a colorblind eye.

Introduction

Color blindness is a condition in which ability to distinguish some colors and shades is less than normal. It occurs when the color sensitive cone cells do not properly pick up or send the proper color signals to the brain. It is most commonly due to an inherited condition or acquired by diseases of the optic nerve or retina. These color problems are linked to the X chromosome and are almost always passed from a mother to her son.

Prevalence of impaired color vision in males is 8% and only 0.5% in females. Although it must have been existed for centuries, the first case on record was discovered in the practice of Dr Tuberville in 1684. Nearly a hundred years later an English chemist by the name of Dalton, who was color blind himself, published the first accurate description of the condition.

The advent of the information age brought with it an increasing importance of colors. Color coded computer information, color printers, color applications for safety, color comparison test mechanism and other needs are driving increasing changes in the occupational requirements for color vision.

Research

In 2005, according to the report of Indian institute of Forensic Medical Sciences:

Color vision deficiency is a condition in which certain colors can not be distinguished, and is most commonly due to an inherited condition. Being color blind does keep one from performing certain jobs and makes other difficult. Compared to persons with normal color vision, they have some trouble differentiating between certain colors, but the severity of the color deficiency is variable. Color blindness is normally diagnosed through clinical testing- Ishihara color test is one of the most common tests used.

It is mainly useful for quick screening. From a practical stand point though, many protanomalous and deuteranomalous people breeze through life with very little difficulty doing tasks that require normal color vision but in some professions a normal color vision is a necessary requisite. This article focuses on the forensic perspective of abnormal color vision and future research and guidelines for assessing an individual for color vision.

Classification of Color Vision Deficiency

Protanopia	Red Deficiency
Deuteranopia	Green Deficiency
Tritanopia	Blue Deficiency
Achromatopia	Absolute color blindness

In a normal trichromat, three wavelengths are required to match a given reference wavelength. Dichromacy occurs when there are only two cones functioning. Monochromats and achromats only need one wavelength to match the reference color. A mild color deficiency is present when one or more of the three cones function "poorly". A more severe color deficiency is present when one of the cones does not function at "all" or is missing.

Red green deficiency is by far the most common form of color blindness. The scientific basis for the same is that, DNA sequences of the red and green receptor gene are so similar, that it is easy for mistakes to occur during the development of egg and sperm, as genetic material is replicated and exchanged between chromosomes.

Those with a less common type have difficulty distinguishing blue and yellow. In very few cases, color deficiency exists to an extent that no colors can be detected; only shades of black, white and gray are seen.

Occupational Requirements

The use of color extends to the work environment, and so it affects job and careers which require some degree of color identification. These careers vary in the extent of reliance on color vision⁴.

Occupation requiring perfect color vision e.g. is:

1. Forensic scientist
2. Driver
3. Armed forces
4. Color matcher in textile, paints & cosmetics.
5. Electrical work
6. Navigation

Occupation where good color vision is desirable, but defective color vision would not necessarily cause a handicap, e.g. are:

1. Accountant
2. Administration
3. Architect
4. Builder
5. Draughtsman
6. Metallurgist
7. Physiotherapy

Occupation where defective color vision may be an asset, e.g.:

1. Camouflage detection

Statistics

According to Institute of Forensic Medical Sciences:

8 percent of the male and 0.5 percent of the female population in the world suffer from different types of color vision deficiency. 99 percent of color vision deficient people cannot recognize red and green colors. 75 percent of these cannot recognize green, while 24 percent cannot recognize red. Only 1 percent cannot recognize blue and yellow.

Dr. Muhammad Moin

Professor and Head of Department Ophthalmology

Quaid e Azam Medical College, Bahawalpur

Interview Questionnaire

1. What is color blindness?
2. Is there any reason that color blindness is important to diagnose? Why?
3. How many number of people are color blind?
4. Do you know any specific percentage which doesn't know about this deficiency?
5. What common mistakes a color blind person can do in your point of view?
6. What jobs are not suitable for color blind people?
7. What suggestions would you like to point for parents?
8. How does an optician or an ophthalmologist test for color blindness?
9. At what age should people be tested for their ability to see colors?

10. Are there treatments to cure color blindness?

Dr. Moin Views

Colorblindness is a genetically inherited disease that has no cure. It runs in the families. The only way to prevent it could be to discourage inbreeding to prevent the carrier genes from coming together in the offspring. There are jobs for which the vision is very important... For example, if you want to fly a plane, or join the police force or air force, you should have the normal vision. Similarly, a doctor should be able to recognize the red blood. However, it doesn't mean that those who cannot see colors cannot be effective workers; they can still see the world in general. But it is necessary to test this deficiency for those jobs that require normal vision for their effective execution.

Color Blind Deficient Peoples

Asif Munir Views

"I was in sixth grade.. Our teacher asked us how we could tell a blind person about colors. My classmates explained how leaves are green, roses are red and the sun looks golden-yellow. I was surprised to hear their replies as for me the meanings of these colors were totally different."

Kashif Mazhar Views

"I always wanted to join the army and I worked hard for it. After my Intermediate when I went for the army admission test, I was given a test that involved recognition of color-coded numbers. I couldn't pass the test. That's when I realized that I was unable to see the colors that others could see..."

Prof. Saeed Akhtar

Saeed Akhtar is one of those legendary artists of Pakistan whose names are not less than icon in Art Industry. His paintings are like mirror where you can easily see, his years of tireless efforts. His works convey a philosophical deepness and charisma, which can be achieved in Art industry after burning midnight oil. We can simply compare his art work with other legendary artists like Gulgee and Jameel Naqsh.

Saeed Akhtar is also known for his famous Portrait Painting of Quaid-e-Azam Muhammad Ali Jinnah, about which Naazish Ata-Ullah who was the Ex. Principal at NCA, says that he was one of the God gifted genius artists ever produced by the college and had brought a good name for the college. She said, "Whenever we see the National Assembly on television, our eyes go straight to the portrait of Quaid-e-Azam painted by Akhtar, which always makes us proud."

Interview Questionnaire

- 1.How you come to know about this deficiency?
- 2.What do you see in red – green?
- 3.How you differentiate these colors?
- 4.How do you avoid making mistakes?
- 5.What are common mistakes a colorblind people do?
- 6.What challenges you faced in life due to this deficiency?
- 7.Good/Bad Experiences in life and what was people’s reaction towards this issue?
- 8.What are your suggestions to those who are color blind?

Prof. Saeed Akhtar Views

“Strangely enough, I didn't know I was colorblind. When we used to play carrom in the hostel, the queen disc, which was of dark crimson color, looked black to me. People started making fun of me and called me blind. I was called by my teacher who questioned me about different colors asked how I could paint so well if I couldn't see all colors. I explained that I read what's written on color tubes. I read if it's yellow, blue or red, and then arrange these colors in order on my palette. So on my palette I know what color is red, blue or yellow. God has made man the prime of all creatures because he can think.. and then act on his thoughts. Man propounds a theory and then disproves his own theory. And that's what I did - proved a theory wrong. I don't say the theory itself is wrong, but I was able to prove it irrelevant in my case.”

Pre- Production, Phase 1

Initially, I was focused towards saeed akhtar’s life as a color blind artist. In focus to his life I have worked on the following pre-production steps.

Interview Questionnaire, Life of Prof. Saeed Akhtar

- 1.Where were you born? Tell us something about your environment or any strong influences on you?
- 2.Were you interested in painting or any other art form when you were growing up?
- 3.When did you realize that you wanted to take up painting as a profession?
- 4.What made you come to NCA?
- 5.Can you tell us something about your family and their reaction to your decision to join NCA and become a painter?
- 6.Tell us something about your personality at the time you joined NCA?
- 7.What role did your time at NCA play in the development of your personality and your artistic

talents?

8.What has been your source of inspiration? Are there any artists who have inspired your work?

9.Would you like to tell us something about your teachers?

10.Do you think artists are born or they are created?

11.When did you become famous? Had you ever imagined how popular you and your work would become?

12.Were there any tough times or unpleasant experiences you had to face?

13.What are the happiest moments of your life?

14.Do you believe you were able to fulfill your potential? Is there anything that you wanted to create but feel you could not?

15.What do you think of art critics, and how do you react to criticism on your work?

16.Are you satisfied with the recognition of your work you have got so far?

17.How would you describe the state of arts and painting in Pakistan?

18.Do you think government and society can play a role in the development of arts?

19.How is the approach of today's aspiring artists different from that of students in your age?

20.What's love to you?

21.Do you think that artists who work for money can be as good as those who have no such motives?

22.Do you feel frustrated when you think you're unable to create what you wanted to create? How do you react to this feeling?

Screen Play

1. Introduction

Interior & Exterior

Location: Gakhar Village, Home, Saeed Akhtar's Studio

We will show some shots of village and saeed akhtar's home exterior. Then we will show some of the studio shots where students are working and saeed akhtar is helping to them. Also we will show some of his paintings.

2. Color Blindness

Interior

Location: Saeed Akhtar's Studio

While saeed akhtar is painting we will show some of shots and then the canvas from his point of view and reveal this deficiency via voice over.

3. Saeed Akhtar

Interior

Location: Saeed Akhtar's Room

Now he will start sharing about his life experiences while sitting in his office and story starts in his own words.

4. Early Age

Interior & Exterior

Location: City Road, Press

We will show saeed akhtar's childhood in a dummy character that is going with his father to the press market where his father makes proof reading in the newspaper. There we will show this child looking at the paintings of Princess Elizabeth and Quaid-e-azam.

5. Teen Age

Exterior

Location: Lahore Railway Station, Kala Shah Kakoo Station

We will show exterior of the Lahore railway station and then we will show a 20 years old boy coming out of the train. The getup of the character would be the same how saeed akhtar was look like.

6. Admission in NCA

Interior & Exterior

Location: NCA

We will show exterior building of NCA and then we will show that boy giving interview to the interview committee. It would shown in a room where three old people are sitting having conversation with him. Also we will show the boy showing them his portfolio. In the end of this scene we will show the color blindness test chart which they didn't discussed and this will reveal by the saeed akhtar's own voice.

7. Carum Board

Interior

Location: Room

Some boys are playing carum board and while playing the boy played queen as black which we will reveal through post production and the expression of his friends towards his this reaction. His own expressions about his this act. In the mean while saeed akhtar will disclose about it.

8. Deficiency

Interior & Exterior

Location: Saeed Akhtar's Studio, Traffic Signal, Road Reflectors

We will show him playing with colors, palette, tubes and their numbers. Also how he judge a color which is red through picking him up a color tube. Some paintings which he made and they are having red and greens in them. How he see this world in term of traffic signals, road reflectors and

environment while working in post production.

9. Award & Achievements

Interior

Location: Saeed Akhtar's Studio

While sitting in his office he will describe about it and we will show the pictures of him while taking awards and his top paintings he created for top profiled personals. We will also show his famous painting of Quaid-e-Azam which is placed in National Assembly. The question Tariq aziz asked him about his work and his reply to him in his own words. He's everywhere.

10. Experiences

Interior

Location: Saeed Akhtar's Studio

Paintings which he created for Famous people like Chinese President, Generals and Quaid-e-Azam. His student's work, while guiding them and playing with the canvas. Message to the struggling artists by saeed akhtar would be in this scene.

Shot Divisions

Scene 1 – Introduction

Sr. #	Visual	Shot Type	Status	Dialogue
1	Studio Exterior of Saeed Akhtar	Long Shot		Introduction of saeed akhtar.
2	Students in studio	Medium Shot		
3	Saeed Akhtar guiding to students	Medium Shot		
4	Working on student's canvas	Close Up		
5	His Famous Paintings	Close Up		
6	Award Pictures	Close Up		

Scene 2 – Other side of the story, color blindness

Sr. #	Visual	Shot Type	Status	Dialogue
1	Saeed Akhtar Painting on Canvas (camera will be on left side)	Medium Shot		Here we will disclose the deficiency of the artist, color blindness.
2	Saeed Akhtar Painting on Canvas	Over the Shoulder		
3	Painting	Close Up		

4	What is color blindness	Slide		Voice Over
5	Types of Color blindness	Slide		Voice Over
6	How we can test Color Blindness	Slide		Voice Over

Scene 3 – Interview with Saeed Akhtar

Sr. #	Visual	Shot Type	Status	Dialogue
1	Saeed Akhtar in his office	Medium Shot		Question: Where were you born? Tell us something about your environment or any strong influences?
2	Hand Movements	Medium Shot		
3	Body Language	Close Up		
4	Face Expressions	Medium Shot		
5	Gakhar Village	Long Shot		
6	Village activity, people on cycle, etc	Medium, Long Shots		
7	Gakhar Home Exterior	Long Shot		

Scene 4 – Inspiration, Press

Sr. #	Visual	Shot Type	Status	Dialogue
1	Street View, Saeed Akhtar with his father	Long Shot		In this whole scene saeed sb will be talking about his childhood and how paintings of Quaid-e-Azam and Queen Elizabeth inspired him. Questions: what has been your source of inspiration?
2	Father Son Entering into Press (Camera will pan from right to left)	Medium Shot		
3	Printing Press Board,	Close Up		
4	Father & Son Entering into Press	Medium Shot		
5	Father Meet with the person there	Medium Shot		
6	Person give his father notes to check	Medium Shot		
7	Notes from one hand to another	Close Up		
8	Kid looking at his father & the other person and move his head to left side	Over the Shoulder		
9	Kid looking at the Paintings on the wall. (Camera will take a close up to paintings from the kid's point of view)	Medium Shot		
10	Kid's Face Expression	Close Up		
11	Paintings of Quaid-e-Azam & Queen Elizabeth	Close Up		

Scene 5 – Teen Age, Railway Station

Sr. #	Visual	Shot Type	Status	Dialogue
1	Establishing Shot of Lahore Railway Station	Long Shot		Saeed Sb will be telling about his arrival to Lahore. What made you come to NCA? And when you joined it? What was the reaction of your family towards painting?
2	Clock on the railway station	Medium Shot		
3	Train is coming into station	Long Shot		
4	Boy is standing in the train with his bag.	Medium Shot		
5	Boy looking to the railway station	Close Up		
6	Boy come out of the train	Medium Shot		
7	Boy coming out of the station	Long Shot		

Scene 6 – Admission

Sr. #	Visual	Shot Type	Status	Dialogue
1	Establishing Shot of NCA	Long Shot		Saeed Sb will be telling about his admission and interview committee.
2	Saeed Sb is giving interview to 3 people	OTS		
3	Interview Committee	Medium Shot		He will also disclose about the color blindness chart didn't discussed with him. Question: How you get admission in NCA and what was the reaction of interview committee? Have they asked you about any color charts?
4	Paintings of Saeed Sb, Portfolio	Close Up		
5	Interview committee positive expressions	Medium Shot		
6	Ishihara Chart close up which was also there on the table	Medium - Close Up		

Scene 7 – Carum Board

Sr. #	Visual	Shot Type	Status	Dialogue
1	Establishing Shot of NCA Hostel	Long Shot		Saeed Sb will disclose to the viewer when he come to know about this deficiency.
2	4 Boys are playing carum board	Medium Shot		
3	Carum Board	Close Up		
4	Boy(Saeed Sb) Playing queen as	Medium Shot		Boys reaction to his color

	black, Hand of saeed sb			blindness.
5	Hand of Saeed Sb	Close Up		Question: How you come to know about this deficiency?
6	Carum Board, Queen, It would be gone into the hole.	Point of View		
7	Boys laughing	Medium Shot		
8	One Boy showing queen to Saeed Sb with the black	Medium Shot		
9	Face Expressions of Boy (Saeed Sb)	Close Up		

Scene 8 – Deficiency

Sr. #	Visual	Shot Type	Status	Dialogue
1	Color Tubes	Close Up		Saeed Sb will disclose the problems he face due to color blindness.
2	Saeed Sb Picking Color Tubes and looking at the tube numbers	Medium Shot		
3	Color Palette	Medium Shot		Questions: What do you see in red & green? How you differentiate these colors? How do you avoid making mistakes? What Challenges you faced due to this deficiency?
4	Color Palette	Close Up		
5	Traffic Signal	Close Up		
6	Road Reflectors	Long Shot		
7	Car Back Lights in Night	Medium Shot		
8	Clothes	Medium Shot		
9	Ludo	Close Up		

Scene 9 – Award & Achievements

Sr. #	Visual	Shot Type	Status	Dialogue
1	Saeed Akhtar	Medium Shot		Saeed Sb will tell about his experiences and how he reacted to criticism.
2	Paintings			
3	Awards			

Scene 10 – Conclusion

Sr. #	Visual	Shot Type	Status	Dialogue
1	Saeed Akhtar's Message	Medium Shot		Message for struggling artists. Question: What Message you would

				like to give to struggling artists?
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Pre-Production, Phase 2

Script

According to Indian Institute of Forensic Medical Sciences and Research, the term color blindness is not correct. A more appropriate term is Color Vision Deficiency, because such a person can see colors but the names for these colors are not the same for him. For example, red grass, green blood, purple sky...

This condition has always been there but it was first diagnosed by Dr Tuberville in 1684. In 1798 the condition was documented for the first time in the form of a scientific paper by a colorblind English scientist, John Dalton. To acknowledge his work, the condition was also called Daltonism.

8 percent of the male and 0.5 percent of the female population in the world suffer from different types of color vision deficiency. 99 percent of color vision deficient people cannot recognize red and green colors. 75 percent of these cannot recognize green, while 24 percent cannot recognize red. Only 1 percent cannot recognize blue and yellow. Medically, these types are known as Deuteranopia, Tritanopia, and Protanopia.

There are different tests used to diagnose color vision deficiency, but the most commonly used test is Ishihara Plates. Color vision deficient people cannot recognize the color-coded numbers in these plates.

Color deficient people have to face some difficulties in their daily lives... traffic signals, choice of clothes, electric wires, road maps, weather newscasts. For the air force or a plane pilot, color vision should be perfect.

I always wanted to join the army and I worked hard for it. After my Intermediate when I went for the army admission test, I was given a test that involved recognition of color-coded numbers. I couldn't pass the test. That's when I realized that I was unable to see the colors that others could see...

To diagnose color vision deficiency, parents should have their kids tested in their childhood. This way they can better prepare for the difficulties ahead in their lives.

The fields of textiles and painting are not considered suitable for color vision deficient people. However, Pakistan's famous artist Professor Saeed Akhtar, despite this weakness, won Presidential Award for Pride of Performance by virtue of his natural gifts.

A man can face colorblindness or any other challenge only if he has the support of people around him. With enough help and support, these people can easily overcome the difficulties in life... Even they can become invaluable national assets like Saeed Akhtar.

Audio/Video Documentation

Video	Audio
Eyes Opening, 20 - 25 different People, Big Close Up	Background Music

Peacock and Nature, Grass, Blood and Sky	According to Indian Institute of Forensic Medical Sciences and Research, the term color blindness is not correct. A more appropriate term is Color Vision Deficiency, because such a person can see colors but the names for these colors are not the same for him. For example, red grass, green blood, purple sky...
Trees, Red Rose, Nature, Colorful Environment, Flower Shop,	Background Music
Yellow and Green Colorful flowers	This condition has always been there but it was first diagnosed by Dr Tuberville in 1684.
Jhon Dalton Picture	In 1798 the condition was documented for the first time in the form of a scientific paper by a colorblind English scientist, John Dalton. To acknowledge his work, the condition was also called Daltonism.
Cricket ground and player colorful kits	Background Music
Crowded Area with a lot of people	8 percent of the male and 0.5 percent of the female population in the world suffer from different types of color vision deficiency.
Colorful Items and Jewelry	99 percent of color vision deficient people cannot recognize red and green colors.
Green Item which could be any thing	75 percent of these cannot recognize green.
Red Item which could be any thing	24 percent cannot recognize red.
Blue and yellow items	Only 1 percent cannot recognize blue and yellow.
Slides of these types	Medically, these types are known as Deuteranopia, Tritanopia, and Protanopia.
Slides of Ishihara Plates	There are different tests used to diagnose color vision deficiency, but the most commonly used test is Ishihara Plates. Color vision deficient people cannot recognize the color-coded numbers in these plates.
Doctor's Interview	Doctor's Opinion about color vision deficiency
Road Traffic, Electric Wires, Road Maps, Traffic Signal, Weather News cast and cloths	Color deficient people have to face some difficulties in their daily lives... traffic signals, choice of clothes, electric wires, road maps, weather newscasts.
Air Force Logo, Pilot Pictures	For the air force or a plane pilot, color vision should be perfect.
Color Deficient Interview, Kashif Mazhar	Life Experience which he would share in the video.

Play Land, Shots of Kids, Colorful Items	To diagnose color vision deficiency, parents should have their kids tested in their childhood. This way they can better prepare for the difficulties ahead in their lives.
Color Deficient Interview, Asif Munir	Life Experience which he would share in the video.
Textile Picture, saeed akhtar painting, saeed akhtar pictures	The fields of textiles and painting are not considered suitable for color vision deficient people. However, Pakistan's famous artist Professor Saeed Akhtar, despite this weakness, won Presidential Award for Pride of Performance by virtue of his natural gifts.
Saeed Akhtar Interview, Carrom Board, Paintings, Color Theory Chart	Saeed Akhtar Views, Experiences, Color Theory
Cloths, Tea Cups, Colorful items, Eid Cards	A man can face colorblindness or any other challenge only if he has the support of people around him. With enough help and support, these people can easily overcome the difficulties in life... Even they can become invaluable national assets like Saeed Akhtar.
Closing of Eyes, 20 – 25 People	Background Music

Shoot Locations

1. Mini Golf Park
2. Model Town Park
3. Tesoro Accessories
4. Humpty Dumpty Playland
5. Saeed Akhtar's Studio
6. Doctor's Clinic
7. Gift Shop (Defense)
8. Clothes Shop (Defense)
9. Ichara Bazaar
10. National College of Arts
11. Saddique Trade Center
12. Aaj Tv Studio (Voice Over)

Production and Post Production

Interview with Saeed Akhtar

20th November, 2010

City Environment Shots

5th December, 2010 - 6th December, 2010

Capturing

7th December, 2010

Editing

8th December, 2010

Interview with Dr. Muhammad Moin

8th January, 2011

Interview with Kashif Mazher and Asif Munir (Color Deficients)

8th January, 2011

Voice Over

3rd January, 2011

8th January, 2011

Capturing

10th January, 2011

Editing

11th January, 2011

Equipment

- Camera: PD170
- Tripod
- Lights:
 - Sun/Daylight for outdoor
 - Studio Lights for Indoor/Interviews
- Collar Microphone
- Tape
 - Sony mini DVC
 - Panasonic mini DVC

Softwares

- Adobe Premiere CS3
- Adobe After Effects CS3
- Adobe Photoshop CS3

Team

- **Equipment/Cameraman**

- Mr. Haider
- **DOP**
 - Muhammad Asif Aleem
- **Lights**
 - Muhammad Asif Aleem/Mr. Haider
- **Script**
 - Muhammad Asif Aleem
- **Voice Over**
 - Ms. Shama Saghir
- **Produced, Directed & Edited By**
 - Muhammad Asif Aleem

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Forensic Medical Sciences

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Color Blindness Statistics

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