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Spectrum and its Sequence Considered with Ordinary Colours and Mixing Logic

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Abstract:- Life as we know has power of sight. We see many things around us and also see the things carrying colors on them. The sun rays when passed through prism gives rise to 7 colors called VIBGYOR. These colors are also found in nature as leaves, flowers, color of fishes, etc. This paper is an attempt to collect some information about colors through comparison with spectrum and calculations derived out of this comparison. The mixing has been done using water colors as this is the 1st attempt to decode colors through mixing and comparing them to the spectrum sequence level.

I. THE SPECTRUM AS SEEN THROUGH PRISM IS VIBGYOR

Let us plot the spectrum with its sequence numbers:

Violet	Indigo	Blue	Green	Yellow	Orange	Red
1	2	3	4	5	6	7

Fig 1: Conventional spectrum sequence

Now we have this sequence when we are seeing from top . Owing to the fact that the sequence is been seen from bottom for an onlooker on earth, I have reversed the spectrum . So, the sequence changes. The changed sequence would look like the below diagram.

Violet	Indigo	Blue	Green	Yellow	Orange	Red
7	6	5	4	3	2	1

Fig. 2: Customized spectrum sequence

II. MIXING OF GREEN WITH RED GIVES RISE TO A LOGIC

In Fig. 2, Green is at 4th sequence and Red is the 1st one. Green when mixed with Red gives rise to Yellow colour which is at the 3rd point in the sequence. Hence, we derive a logic here,

Green mixed to Red = 4 mixed to 1 = 3 which is yellow

Now, 4 subtracted to 1 gives 3

So, the logic derived from 4-1=3 , which is true is Green minus Red = Yellow

Means, Mixing of two colors(considering color as the only entity) is subtraction as per the corresponding sequence of the spectrum.

So, **Green - Red =Yellow which means mixing to convert is minus(-) or the logic of reduction for colors is the 1st derivation. So, gr = g' – r' where g is the green color and r is Red and g' the location of green in the sequence and r' is the location of red in the sequence.**

Again,
4-1=3
2*2 -1 =3

But, 2 +1=3 which means 2*2=2 for the logic of reduction of colors.

So, **x^n = x for the law of reduction of colors is the 2nd derivation.**

III. MIXING OF INDIGO AND YELLOW GIVES GREEN AND GREEN MIXED TO RED GIVES BACK YELLOW

Lets plot the Fig. 2 again

Violet	Indigo	Blue	Green	Yellow	Orange	Red
7	6	5	4	3	2	1

Fig 3: Customized spectrum sequence

Indigo(6th in the sequence) mixed to yellow(3rd in the sequence) gives green(4th in the sequence)

6 – 3 = 4
⇨ 3*2 -3 = 4

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- ⇨ 3*(2-1) =4
- ⇨ 3* 1 = 4
- ⇨ 3+1=4

Multiplication is actually addition in the color domain. Or mixing of sequences which have a common factor do add up to the difference.

"If x is a 1st color which is a prime number when it's a sequence value nor a perfect square as a sequence value, the common factor of x and the 2nd color's sequence y's common factor do add up to the difference between the 2 color's sequence value's other factors is the 3rd derivation ."

IV. MIXING OF RED AND YELLOW GIVES ORANGE

3 mixed to 1 gives 2

3 -1 =2 which is a proof of derivation1.

V. VIOLET DERIVED INDEPENDENTLY

Violet is 7= Red mixed to blue= 5 mixed to 1

5-1=7

5.1-1.1=1(5-1)=1(5+1)=1+6=7

"If a sequence value is x of the 1st color which is a prime number but not a perfect square as a sequence value, the common factor of x and the 2nd color y's sequence value (which is a perfect square), then the square-root of y is added to the other 2 factor's addition is the 4th derivation"

VI. BROWN DERIVED INDEPENDENTLY

Brown= Orange+ Green +violet= 7-4-2

- ⇨ (7-2)-4= 1(7-2) -4 = (1+5) – 4= 6 -4= 2.3 - 2.2= 2(3-2)
- ⇨ By 4th derivation, 2(3+2)=10

VII. WHITE DERIVED INDEPENDENTLY

White= Red+ Green + indigo= 6-4-1= (6-4)-1=(3.2-2.2)-1= 2(3-2)-1= 2(3+2) -1= (2+5)-1=7-1

- ⇨ 7-1= 1(7-1)= 1+7+1=9

The clouds seem white in presence of blue space/ sky.

The moon seems white in presence of black space/sky.

VIII. BLACK DERIVED INDEPENDENTLY

Black = Blue + indigo +red + yellow

- ⇨ Black= 5-6-1-3=(5-3)- (6-1)= 1(5-3)- (6-1)= (1+2)-(6-1)
- ⇨ 3-(6-1)= 3- 1(6-1)=3-(1+6+1)=3-8
- ⇨ As per 2nd derivation,
- ⇨ 3-2=1(3-2)=1+1=2 = yellow which is sun's/ fire's color and finally gives black space / black ashes from fire. Black also is part of space for 12 hours of the day .

IX. SOME CALCULATIONS:

a. The clouds seem white in presence of blue space/ sky.

Blue- white= 5-9=5-3=2=yellow which is the color of sun.

b. The moon seems white in presence of black space/sky.

Black- white= 2-9=9-2=3-2=1+1=2 =yellow which is the color of sun and sun's light makes the moon shine white is the law we know.

X. APPLICATION OF THESE 4 DERIVATIONS TO HUMAN BODY

a. Blood dries up to brown

Red liquid when separated from the body becomes brown with time. Red mixes with white light giving brown.

- ⇨ 1-9=10
"Both 9 and 1 are perfect squares, so mixing them gives a 5th derivation which is if the sequence values are perfect squares, they can be simple added to give the sequence of the combinatory color provided one of the color is absent in the spectrum and the other is part of the spectrum."

b. Blood is always attached to pink muscles/tissues enclosed in a brown skin.
Pink is a combination of red and white. But in the body we have red blood, white bones and pink muscles as separate entities which do not mix. On the other hand, in nature indigo mixed to red light gives pink.

- ⇨ **6-1=1(6-1)=1+(6+1)=1+7=8**
- ⇨ **"Pink is the 8th color of the spectrum is the 6th derivation."**

XI. CONCLUSION

Hope this paper throws some light on the unexplored areas of the spectrum and visible color.

REFERENCES

[1.] B. Tarulatha, N. Shroff and M. B. Chaudhary, "VIBGYOR indexing technique for image mining," 2016 International Conference on Data Mining and Advanced Computing (SAPIENCE), 2016, pp. 191-193, doi: 10.1109/SAPIENCE.2016.7684150.

[2.] Akshaya and N. N. Nagendra, "Thin Film Optical Filters: Bandpass Characteristics of VIBGYOR Wavelengths," 2018 4th International Conference for Convergence in Technology (I2CT), 2018, pp. 1-4, doi: 10.1109/I2CT42659.2018.9058160.

[3.] C. Sun, "Research and design of collimating prism that can obtain parallel light," 2020 International Conference on Computer Vision, Image and Deep Learning (CVIDL), 2020, pp. 416-420, doi: 10.1109/CVIDL51233.2020.00-58.
[4.] Ş. K. Çetindağ, O. Ferhanoğlu, M. F. Toy and F. Çivitci, "Speckle-Enhanced Prism Spectrometer," 2019 International Conference on Optical MEMS and Nanophotonics (OMN), 2019, pp. 84-85, doi: 10.1109/OMN.2019.8925014.
[5.] A. Akbarzadeh and C. Caloz, "Gaussian Beam Diffraction by the Inverse Prism," 2018 IEEE International Symposium on Antennas and Propagation & USNC/URSI National Radio Science Meeting, 2018, pp. 2415-2416, doi: 10.1109/APUSNCURSINRSM.2018.8608918.
[6.] X. Liu et al., "Underwater Wireless Optical Communication and Underwater Solid-State Lighting Based on RGB Laser Diodes Mixed White-Light," 2018 15th China International Forum on Solid State Lighting: International Forum on Wide Bandgap Semiconductors China (SSLChina: IFWS), 2018, pp. 1-3, doi: 10.1109/IFWS.2018.8587351.
[7.] H. Ren, S. Li, R. Sun and Z. Su, "Study on LED Color Mixing for Stage Lighting Based on Locus Fitting of Blackbody," 2017 International Conference on Computer Technology, Electronics and Communication (ICCTEC), 2017, pp. 295-299, doi: 10.1109/ICCTEC.2017.00070.
[8.] Y. Gao, H. Wu, J. Dong and G. Q. Zhang, "Constrained optimization of multi-color LED light sources for color temperature control," 2015 12th China International Forum on Solid State Lighting (SSLCHINA), 2015, pp. 102-105, doi: 10.1109/SSLCHINA.2015.7360699.
[9.] B. Zlatković, A. Krmpot, I. Radojičić, D. Arsenović, M. Minić and B. Jelenković, "Slow and stored light in amplifying four way mixing process," 2016 18th International Conference on Transparent Optical Networks (ICTON), 2016, pp. 1-3, doi: 10.1109/ICTON.2016.7550577.
[10.] B. Galabov, "Control of Human Centric Lighting systems considering the natural and artificial light mix," 2020 12th Electrical Engineering Faculty Conference (BulEF), 2020, pp. 1-6, doi: 10.1109/BulEF51036.2020.9326051.
[11.] U. Bortolozzo, S. Residori and J. P. Huignard, "Slow and fast light in liquid crystal light valves," 2008 Conference on Lasers and Electro-Optics and 2008 Conference on Quantum Electronics and Laser Science, 2008, pp. 1-2, doi: 10.1364/SL.2008.STuA6.