A Study on Colors and Emotions of Video Contents -Focusing on depression scale through analysis of commercials

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Abstract

This study is intended to analyze colors felt in TV commercials among video contents, to provide basic resources of color plan that can be applied to production of contents and to help acceptors to change their mood and to lower depression levels. Many studies have revealed the obvious correlation between depression and suicide, so the World Health Organization(WHO) recommends the importance of media by recognizing public that depression is a serious risk factor that leads to suicides and by asserting the necessity of establishing social environment for active treatment. Contents production companies have social and cultural responsibility to convey correct information and to make acceptors have positive emotions. If the result of colors that emotionally healthy people feel through this study is used for production of video contents, it will be helpful to lower the depression scale and to prevent and treat depression by providing visual comfort. In addition, it is expected to be used as an important basic resource for not only production of video contents but also color plan of industrial fields.

Key Words: video contents, color, emotion, depression scale .

I. INTRODUCTION

Among various types of information acquired through vision such as objects' forms, sizes and shapes, the broad spectrum of colors creates images in combination with all the above factors. A study reported that a color is a very important element that is absorbed to human body through eyes, respiratory organs and skin affecting health, and functions in inner mental and emotions adjusting the mood and soul of humans. It was already scientifically proven that colors are very intensive messages that convey intuitive meanings and feelings and affect the human's emotion system. Since the powerful ability of colors affects human's emotions and physical conditions, the color plan of video contents that convey all types of information through vision and auditory sense is very essential.

In human's emotions, the condition of mood can change either positively or negatively through the change of environment and certain stimulations. People might try to change their emotions into positive ones in their own ways. In that video contents are provided as unilateral and direct stimulations without filtering to acceptors through broadcasting and other media, it is necessary to establish color plans that are closely related to emotions considering the social and cultural responsibilities.

The purpose of this study is to produce video contents by applying the result colors and emotions that mentally and emotionally healthy people feel, to help relief of depression scale and treatment of depression, to prevent depression by offering visual comfort to acceptors with normal depression scale, and to provide a basic resource for production of video contents and color plans of industrial fields.

II. RESEARCH METHOD

Regarding research methods, we had those who have the normal sense of color do self-checking with BDI (Beck Depression Inventory), which is a self-report type of depression scale invented by an American psychiatrist Aron Beck in 1961 and widely used in the world, showed them the black and white version of grand prix winners works in Korea AD Awards of 2015 and 2016, and then asked them to mark the colors that they felt. The presented colors were total 13 colors including 10 basic colors of Munsell color system with exclusion of value and chroma among three attributes of color (hue, value, chroma) along with BL-N0W-N11 and N4 for generalization and simplification of

this experiment. To find out the emotions felt by watching the advertisements, we used the SD method, a psychological evaluation method presented by an American psychologist Osgood. The targets of research were total 409 people including members of Daegu Hana Church from teenagers to the elderly in their 70s, and students and teachers of Dongju Girls' High School in Busan.

Fig. 1. Still picture image of the grand prix winners work in Korea AD Awards of 2015.

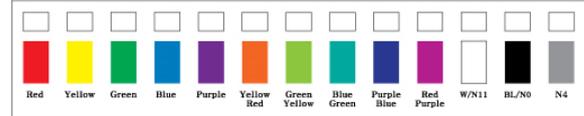Fig. 2. Still picture image of the grand prix winners works in Korea AD Awards of 2016.

Fig. 3. Colors used in the research

III. THE RESULT AND ANALYSIS

3.1 The result of depression scale BDI research

Table 1. Depression scale examination result.

BDI Score	Depression Scale	Research Result	
0~9	Not depressed	**285 persons**	Total 409 persons
10~15	Slightly depressed	**71 persons**	
16~23	Intermediately depressed	**34 persons**	
24~63	Severely depressed	**19 persons**	

We could obtain 409 valid samples including 285 members of BDI 0~9 group(not depressed), 71 of 10~15 group(slightly depressed), 34 of 16~23(intermediately depressed) and 19 of 24~63(severely depressed). This study is to find out the differences among each group, and the gender and age are not included to classification conditions for analysis

3.2 The result and analysis of colors in Ministry of Environment's public advertisement on recycle in Korea AD Awards of 2015

Table 2. Color research statistical chart of Korea AD Awards of 2015

Korea AD Awards of 2015 * BDI_grp Table					
Frequency	**BDI_grp**				**Sum**
%	0_9p	10_15p	16_23p	24_63p	
01 red	6	2	0	2	**10**
	2.14	2.86	0	10.53	
02 yellow	58	9	4	4	**75**
	20.71	12.86	11.76	21.05	
03 green	22	5	2	1	**30**
	7.86	7.14	5.88	5.26	
04 blue	36	11	6	0	**53**
	12.86	15.71	17.65	0	
05 purple	7	0	1	0	**8**
	2.5	0	2.94	0	
06 Yellow Red	16	5	0	2	**23**
	5.71	7.14	0	10.53	
07 Green Yellow	24	4	2	0	**30**
	8.57	5.71	5.88	0	

	0_9p	10_15p	16_23p	24_63p	Sum
08 Blue Green	15	1	1	2	19
	5.36	1.43	2.94	10.53	
09 Purple Blue	17	2	2	1	22
	6.07	2.86	5.88	5.26	
10 Red Purple	11	3	0	1	15
	3.93	4.29	0	5.26	
11 White	15	6	3	0	24
	5.36	8.57	8.82	0	
12 Black	19	10	8	2	39
	6.79	14.29	23.53	10.53	
13 Grey	34	12	5	4	55
	12.14	17.14	14.71	21.05	
Sum	280	70	34	19	403
Valid Specimen Size = 403 / the number of missing value = 6					
$x2=41.1953$ df=36 p=0.2537					

In 280 of BDI 0~9 group, 58 people (20.71%) said yellow and 36(12.86%) said blue. In 70 of BDI 10~15 group, 12 people (17.14%) said grey and 11(15.71%) said blue. In 34 of BDI 16~23 group, 8 people (23.53%) said black and 6(17.65%) said blue. In 19 of BDI 24~63 group, 4 people (21.05%) said grey and blue respectively and 2 people (10.53%) said red, yellow red, blue green and black respectively. The color yellow was selected by the most people including 58 people (20.71%) in 0~9 group as at 24~63 group. In addition, while no one chose blue in 24~63 group, blue was chosen by the second most people in the rest 3 groups. Especially the colors chosen by the second most people in 24~63 group are red, yellow red, yellow blue and black, which is noticeable in that different colors are chosen rather than one color.

3.3 The result and analysis of colors in Samsonite Curve Experiment in Korea AD Awards of 2016

Table 3. Color research statistical chart of Korea AD Awards of 2016

Korea AD Awards of 2016 * BDI_grp Table					
Frequency %	BDI_grp				Sum
	0_9p	10_15p	16_23p	24_63p	
01 red	19	5	3	1	28
	6.81	7.14	8.82	5.26	
02 yellow	28	4	2	3	37
	10.04	5.71	5.88	15.79	
03 green	23	1	0	1	25
	8.24	1.43	0	5.26	
04 blue	30	9	2	1	42
	10.75	12.86	5.88	5.26	
05 purple	7	1	4	1	13
	2.51	1.43	11.76	5.26	
06 Yellow Red	19	9	2	1	31
	6.81	12.86	5.88	5.26	
07 Green Yellow	22	5	2	2	31
	7.89	7.14	5.88	10.53	
08 Blue Green	16	5	1	1	23
	5.73	7.14	2.94	5.26	
09 Purple Blue	27	7	4	2	40
	9.68	10	11.76	10.53	
10 Red Purple	13	0	2	1	16
	4.66	0	5.88	5.26	
11 White	21	4	6	2	33
	7.53	5.71	17.65	10.53	
12 Black	22	7	3	1	33
	7.89	10	8.82	5.26	
13 Grey	32	13	3	2	50
	11.47	18.57	8.82	10.53	
Sum	279	70	34	19	402
Valid Specimen Size = 402 / the number of missing value = 7					
$x2=35.3923$ df=36 p=0.4973					

In 279 of BDI 0~9 group, 32 people (11.47%) said grey and 30(10.75%) said blue. In 70 of BDI 10~15 group, 13(18.57%) said grey, and 9 people (12.86%) said blue and yellow red respectively. In 34 of BDI 16~23 group, 6(17.65%) said white, and 4(11.76%) said purple and purple blue respectively. In 19 of BDI 24~63, 3(15.79%) said yellow, and 2(10.53%) said yellow green, purple blue, white and grey respectively. What is interesting is that the second most people chose yellow green, purple blue, white and grey in BDI 24~63 group.

The statistical result of overall color choice showed that each group chose different colors. For Korea AD Awards of 2015, yellow is the color chosen by 58(20.71%), which is the most people, in BDI 0~9 group, but in BDI 24~63 group 4 people (21.05%), which is the most people, chose yellow and other 4 people also chose grey, which shows the difference between the two groups. In BDI 24~63 group, no one chose blue, but in the rest 3 groups, blue was chosen by the second most people. For Korea AD Awards of 2016, 3 people (15.79%) of BDI 24~63 group chose yellow, but in BDI 0~9 group, the most people chose grey. In advertisements of both years, the color chosen by the most people in BID 24~ 63 groups was red, yellow red, blue green, black, yellow green, purple blue, white and grey, which means different colors are distributed by around 10%.

3.4 The result and analysis of emotions in Ministry of Environment's public advertisement on recycle in Korea AD Awards of 2015

Table 4. Emotion research statistical chart of Korea AD Awards of 2015

BDI_grp	0_9p (n=285)			10_15p (n=71)			16_23p (n=34)		
Variable	N	Average value	Standard deviation	N	Average value	Standard deviation	N	Average value	Standard deviation
sd_1	276	4.076	1.498	69	4.406	1.468	34	4.647	1.686
sd_2	275	3.873	1.425	69	4.449	1.43	34	4.5	1.973
s4_3	275	3.422	1.498	69	3.913	1.755	34	3.824	1.783
sd_4	274	3.993	1.571	69	4.261	1.4	34	4.588	1.617
sd_5	275	3.735	1.499	69	4.087	1.652	34	3.941	1.74
sd_6	275	3.716	1.516	69	3.406	1.343	34	4.471	1.502
sd_7	273	4.077	1.319	69	4.246	1.355	34	4.529	1.619
sd_8	275	3.891	1.176	69	4.072	1.229	34	4.618	1.303
sd_9	273	3.821	1.249	69	3.899	1.285	34	4.235	1.304
sd_10	276	3.855	1.614	69	4.391	1.574	34	4.941	1.722
sd_11	274	3.865	1.246	68	4.221	1.515	34	4.265	1.504
sd_12	276	3.92	1.402	68	3.985	1.531	34	4.706	1.715
sd_13	275	4.287	1.458	69	4	1.636	34	4	1.954
sd_14	276	3.797	1.545	68	3.838	1.767	34	4.147	1.69
sd_15	275	3.451	1.427	68	4.044	1.332	34	4.324	1.701

| BDI_grp	24_63p (n=19)				
Variable	N	Average value	Standard deviation	F value	Pr > F
sd_1	18	5.111	1.278	4.22	**0.0059**
sd_2	18	4.444	1.464	4.45	**0.0043**
sd_3	18	3.389	1.787	2.2	0.0872
sd_4	18	4.611	1.65	2.44	0.0639
sd_5	18	3.833	1.689	1.02	0.3828
sd_6	18	4.167	1.465	4.43	**0.0045**
sd_7	18	4.444	1.097	1.57	0.1972
sd_8	19	4.368	1.535	4.33	**0.0051**
sd_9	18	3.5	0.857	1.64	0.1793
sd_10	18	5.167	1.383	8.64	**<.0001**
sd_11	18	4.5	1.2	2.91	**0.0344**
sd_12	18	3.222	1.309	4.63	**0.0034**
sd_13	18	3.5	1.098	2.13	0.0964
sd_14	18	3.167	1.2	1.51	0.2105
sd_15	18	4.333	1.715	7.16	**0.0001**
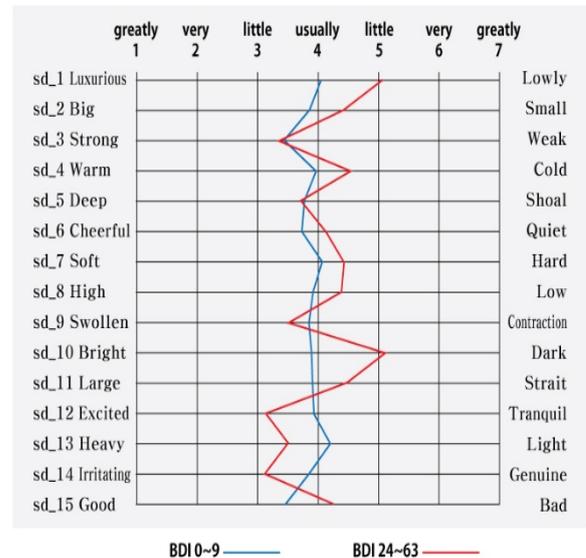
Fig. 4. SD method statistic graph between two BDI depression scale groups (0~9/24~63) for Korea AD Awards of 2015.

Overall, there was statistically significant difference in 'elegant – vulgar, big-small, cheerful-quiet, high-low, bright-dark, wide-narrow, exciting-calm, good-bad'.

With normal score (4 points) standard, the difference between BDI 0~9 group and 24~63 group appeared in 'big-small, warm-cold, cheerful-quiet, high-low, heavy-light, good-bad.

In other words, the emotion words chosen by those who are not depressed were 'big, warm, cheerful, high, heavy, good', and those who are depressed were 'small, cold, quiet, low, light, bad', which are opposite, in Korea AD Awards of 2015, showing the difference between the two groups.

Table 5. Emotion adjectives chosen by two BDI Depression scale groups (0~9/24~63) in Korea AD Awards of 2015 .

Korea AD Awards of 2015		BDI 0~9 State with no depression	BDI 24~63 State with serious depression
SD Emotion Adjectives		Big	Small
		Warm	Cold
		Cheerful	Quiet
		High	Low
		Heavy	**Light**
		Good	Bad

3.5 The result and analysis of emotions in Samsonite Curve Experiment in Korea AD Awards of 2016

Table 6. Emotion research statistical chart of Korea AD Awards of 2016

BDI_grp		0_9p (n=285)			10_15p (n=71)			16_23p (n=34)	
Variable	N	Average value	Standard deviation	N	Average value	Standard deviation	N	Average value	Standard deviation
sd_1	278	3.669	1529	69	4.13	1.484	34	4.176	1.29
sd_2	276	3.449	1.404	69	3.783	1.371	34	3.971	1.381
sd_3	278	3.094	1505	68	3.147	1.577	34	3.5	1.308
sd_4	275	3851	1.341	69	4.145	1.508	34	4.382	1.326
sd_5	275	3.593	1.349	69	3.754	1.387	34	3.941	1.556
sd_6	276	3.558	1.57	69	3.797	1.72	34	4.176	1.749
sd_7	276	3.982	1.517	69	4.797	1.461	34	3.941	1.455
sd_8	276	3.725	1.37	69	4.014	1.091	34	4.324	1.147
sd_9	276	3.518	1.355	69	3.739	1.302	34	3.912	1.401
sd_10	278	3.504	1.466	69	3.87	1.454	34	4.324	1.736
sd_11	275	3.48	1.302	69	3.754	1.311	34	3.853	1.329
sd_12	276	3.986	1.577	68	3.941	1.656	34	4.147	1.54
sd_13	279	4.097	1.479	68	4.118	1.541	34	4.118	1.493
sd_14	277	3.924	1.59	68	3.632	1.601	34	4.5	1.503
sd_15	277	3195	1.359	68	3.456	1.588	34	3.794	1.274

| BDI_grp		24_63p (n=19)			
Variable	N	Average value	Standard deviation	F value	Pr > F
sd_1	18	4.278	1.364	3.14	**0.0253**
sd_2	18	3.944	1.056	2.63	**0.0496**
sd_3	18	3.333	1.782	0.82	0.4828
sd_4	18	4.611	1.685	3.32	**0.02**
sd_5	18	3.667	1.029	0.81	0.4872
sd_6	18	4.056	1.589	2.04	0.1072
sd_7	18	4.611	1.577	6.18	**0.0004**
sd_8	18	4.056	1.11	3.12	**0.0259**
sd_9	19	3.632	1.77	1.15	0.328
sd_10	18	4.611	1.614	6.08	**0.0005**
sd_11	18	3.5	0.857	1.47	0.2227
sd_12	18	3.389	1.378	0.97	0.4072
sd_13	18	3.944	1.305	0.07	0.0976
sd_14	18	4	1.414	2.3	0.0769
sd_15	18	4.056	1.434	3.92	**0.0089**
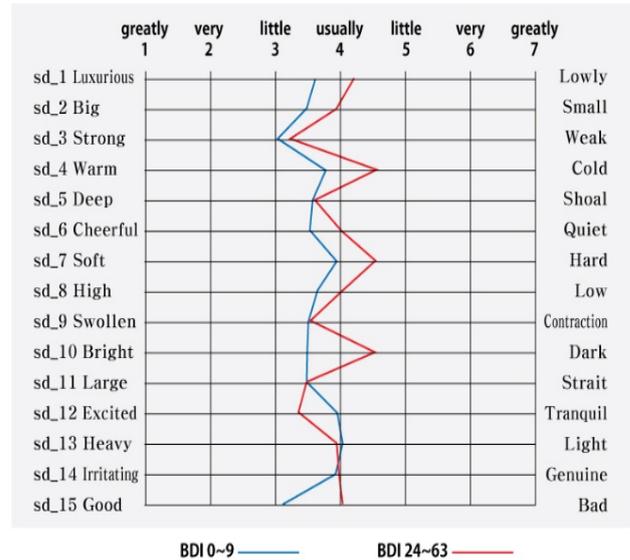
Fig. 5. SD method statistic graph between two BDI depression scale groups (0~9/24~63) for Korea AD Awards of 2016

Overall, there was statistically significant difference in 'elegant – vulgar, big-small, warm-cold, soft-hard, high-low, bright-dark and good-bad'.

With normal score(4 points) standard, the difference between BDI 0~9 group and 24~63 group appeared in 'warm-cold, soft-hard, bright-dark, heavy-light and good-bad.

In other words, the emotion words chosen by those who are not depressed were 'warm, soft, bright, light and good', and those who are depressed were 'cold, hard, dark, heavy and bad', which are opposite, in Korea AD Awards of 2015, showing the difference between the two groups.

Table 7. Emotion adjectives chosen by two BDI Depression scale groups(0~9/24~63) in Korea AD Awards of 2016

Korea AD Awards of 2016	BDI 0~9 State with no depression	BDI 24~63 State with serious depression
SD Emotion Adjectives	Big	Small
	Warm	Cold
	Soft	Hard
	Bright	Dark
	Light	**Heavy**
	Good	Bad

IV. CONCLUSION

This study researched and analyzed colors and emotions felt by those with normal depression scale and those who were diagnosed of depression on TV commercials that contain all the elements of images including story and colors in short video images among video contents. The purpose of this study was to provide a basic resource that can be applied to production of contents, so that it can help acceptors of video contents to change their mood and to relieve depression scale.

The vibration of colors is absorbed into body, restores vitality of all the tissues in the body and stimulates mental recovery, making emotions harmonized. Therefore, if colors are properly chosen and used, positive energy can be created in the body.

The feeling of depression is developed into a disease depression, which eventually can cause the extreme result of suicide. It can also cause social problems such as violent crimes. The feeling of depression is a normal emotion that humans feel, but if it is neglected, it can be developed into a disease causing serious problems. Therefore, it is necessary to try to switch the feeling of depression into the feelings of joy and happiness in our daily lives. That's why the role of video contents, which are in the center of our culture, is very important. In summary, if the colors and emotions felt by mentally healthy people are used for production of video contents, depression patients can relieve their depression scale and can be treated, and normal acceptors of video contents can be provided with visual comfort, so they can prevent depression. In addition, this study is expected to be used as an important basic resource for color plans of industrial fields as well as production of video contents.

REFERENCES

[1] S. Kim, *Colors Change My Body*, Nexus BOOKS, Seoul, 2009.

[2] H. Kim, "Review of Color Psychology and Color Therapy," *Special Edition of Architectural Institute*, vol. 45, no. 6, pp. 45-46, 2001.

[3] J. Shim, J. Lee, D. Lee and C. Lim, "Effective Storytelling through the Change of Colors," *Collection of HCI Korea Research*, pp. 755-756, 2012

[4] S. An and H. Lee, "Direction of Media Coverage for Prevention of Suicide: Analysis of Depression Coverage Contents through Health Faith Model," *Health and Social Affairs Research* Vol.36, pp. 529-564, 2016

[5] S. Oh, *Color Psychology and Temptation of Color Marketing's Colors*, Salim Books, Seoul, 2004

[6] C. Yu and Y. Kwak, "A Study on Color Emotions of Sole Color and Coloration of Two Colors through Emotion Adjectives," *Collection of HCI Korea Research* Vol. 5 No. 1, pp. 20-24, 2010.

[7] I. Asa, translated by S. Park, *How Blind People See the World*, Geul Hangari, 2016

[8] E. Heller, proofread by E. Mun, translated by Y.Lee, *Temptation of Colors*, Yedam, Seoul, 2002

[9] M. Cooper and A. Mattews, translated by J. An, *Color Smart, Why is this color sold well?*, Today's Book, Seoul, 2002.

[10] N. Sartorius, co-translated by Association of Young Psychiatrists, *Struggles for Mental Health*, Gyujangsa, Seoul, 2003.

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