Emphasis on the blue: Turkish basic colour terms*

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1. Introduction to previous experimental studies

The aim of this research is to establish Turkish basic colour terms in accordance with Brent Berlin and Paul Kay's (1969) basic colour terms theory and ascertain the position of *lacivert* 'dark blue'. In addition with the 65 colour tile selection established by Davies & Corbett' (1994, 1995) 17 additional Color-aid tiles from the purple-blue region were used in the naming task in order to specify the status of *lacivert* 'dark blue'.

Emre Özgen and Ian R. L. Davies (1998) conducted three experiment based study of Turkish colour terms. In the first experiment 223 subjects (children, students and adults) completed time restricted (5 minutes) written list task. In reporting list task results they comment on having collapsed all simple terms used with a general modifier, i.e. *açık* 'light' and *koyu* 'dark' onto the simple form (1998: 925). This trend seems to continue through the whole article eliminating all modifiers. In the second experiment "a subset of the child and adult samples" (1998: 928) (altogether 50 subjects) from the previous experiment took part in the colour naming task conducted with Davies & Corbett' general method for establishing basic colour terms (1995). They report that "measures of salience and consensus derived from the two tasks converge to suggest that Turkish has 12 basic color terms" (1998: 919). Besides the list and colour naming tasks for establishing Turkish basic colour terms, Özgen & Davies performed a third experiment where 125 university students were tested during a class. They were asked to "write down as many kinds of *mavi* as they could think of" and having finished that the subjects were asked to "write down whether *lacivert* is a kind of *mavi*" (1998: 942). The results showed that 57% of subjects included *lacivert* 'dark blue' in their lists of types of *mavi* 'blue'; furthermore 85.5% regarded *lacivert* 'dark blue' as a kind of *mavi* 'blue' (1998: 942). These results suggest that *lacivert* 'dark blue' violates Brent Berlin & Paul Kay's non-inclusion criteria for basicness, which states that basic colour term signification is not included in that of any other colour term (1999: 6).

The author conducted her own two field tests to determine if the position of *lacivert* 'dark blue' as the 12th Turkish basic colour term would be supported or refuted by the fieldwork results. The author used 82 (65 standard + 17 additional purple-blue) tiles in the colour naming task to more precisely establish the foci of *lacivert* 'dark blue'.

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2. Method

The list and naming tasks based on the fieldwork method of Davies & Corbett were conducted in Ankara and Antalya on March 17–23 and July 12–26, 2007.

The fieldwork consisted of two parts: 1) oral list task, where the subjects were asked to name as many colours as they knew; 2) naming task, where the subjects were asked to name 65 standard and 17 additional Color-aid tiles.

The terms given were written down by a native or a fluent Turkish speaker as they were said and in the form said by the native subjects. An intrinsic part of the field method is also the subject's colour vision, which was tested with *City University Colour Vision Test* (Fletcher 1998), which enabled the interviewer to determine whether or not the subject had normal colour vision. In fact, 4 subjects did not pass the test and their answers were not included in the colour naming part of the data.

3. Subjects

List task was completed by 60 subjects, 31 females (mean age 28.7) and 29 males (mean age 35.6). The youngest subject was a 14-year old schoolgirl and the oldest a 79-year old former schoolteacher. Most subjects, i.e. 33% of males and 32% of females were young adults between the ages of 19 and 35. Their age group was succeeded by the adult group (aged 36–65) with a 13% representation in both sexes. The least represented age groups were the elderly (5%) and the teenagers (3%). No children were tested.

Most subjects (altogether 35, 20 females and 15 males) had attained a high school diploma. It should be taken into account that generally the subjects were full-time university students in the middle of obtaining university education. 19 subjects (11 males and 8 females) already had a university degree (BA, MA, or Ph.D.).

All 60 subjects completed the oral list task and out of them 56 continued on to the naming task as four subjects did not pass The City University Colour Vision Test (Fletcher 1998), which was used to assess the subject colour vision.

4. Stimuli

All subjects took part in the naming task where a "standard set" of 65 coloured tiles suggested by Davies & Corbett (1995) was used from the Color-aid Corporation 220 Standard Set. The 65 'tiles' were originally chosen by Davies & Corbett because they "formed a coarse, but evenly spread sample of colour space" (1995: 27). This constriction was used for the sake of expedience and for allowing to test a relatively large numbers of subjects in everyday situations, e.g. on the street, at home and work. The tiles consisted of the Color-aid coloured paper glued to a 5 x 5 x 0.2 cm cardboard.

For ascertaining the position of *lacivert* 'dark blue' in the Turkish colour terms hierarchy 17 additional tiles were selected from the purple-blue region of colour space. The 17

extra tiles used in the naming task were: BV T1, BV T2, BV S1, BVB T1, BVB T2, BVB T3, BVB S1, B T2, B T3, B T4, B S1, B S2, B S3, BG T2, Cobalt Blue, Navy Blue and Cyan Blue. The additional tiles selected for the naming task covered the whole blue range of Color-aid tiles and most of the purple-blue region with 3 supplementary tiles finishing the selection.

82 tiles (65 standard + 17 additional) tiles were randomly shown to subjects one after another one on a neutral grey background in natural daylight.

5. Results

Altogether 5604 terms were named during both tasks, 562 were different terms. Out of 3640 possible colour terms (65 tiles x 56 subjects = 3640 terms) a little over 3600 were given for standard tiles. For 17 extra tiles 951 answers out of 952 possible (17 x 56 = 952) were given (tile, B T4, was left unnamed).

5.1. List task

According to the list task frequency in Table 1 the most widely used colour terms in Turkish are: *yeşil* 'green' (frequency 58, i.e. 97% of all informants listed this term), followed by *sarı* 'yellow' and *siyah* 'black' (93%), then *beyaz* 'white' (90%), *kırmızı* 'red' (88%), *mavi* 'blue' (87%); after a little drop in frequency by *mor* 'purple' and *kahverengi* 'brown' (80%), *pembe* 'pink' and *turuncu* 'orange' (78%). The following term *gri* 'grey' (72%) has a frequency (43) comparable to *lacivert* 'dark blue' (41, i.e. 68%). Frequency is crude, but effective criteria for finding out the most commonly used colour terms. After the basic colour terms and the possible basic colour term candidate *lacivert* 'dark blue' the frequency drops by a quarter, e.g. *lila* 'lilac' and *bordo* 'bordeaux' (43%), *eflatun* 'mauve' (40%), succeeded by *bej* 'beige' (30%) and *turkuaz* 'turquoise' (28%).

As shown in Table 1, frequency suddenly drops from 68% for *lacivert* 'dark blue' to 43% for the terms *lila* 'lilac' and *bordo* 'bordeaux' holding respectively the 13th and 14th position. The 50% usage frequency draws a rough line between the basic colour terms and the non-basic colour terms, but this is only one indicator of basicness. While together with a mean position of 10.46 it indicates *lacivert* 'dark blue' as the 12th Turkish basic colour term, but as it is only from the analysis of the list task data, and insofar not conclu-sive.

Table 1. The most salient colour terms in the list task (ranked by salience)
Fr – frequency, % – usage percentage, mp – mean position, salience – cognitive salience index

Term	Gloss	Fr	%	Rank	Mp	Rank	Salience	Rank
kırmızı	red	53	88.3	5	3.72	1	0.2375	1
mavi	blue	52	86.7	6	3.81	2	0.2275	2
yeşil	green	58	96.7	1	5.05	3	0.1914	3
sarı	yellow	56	93.3	2.5	6.04	4	0.1545	4

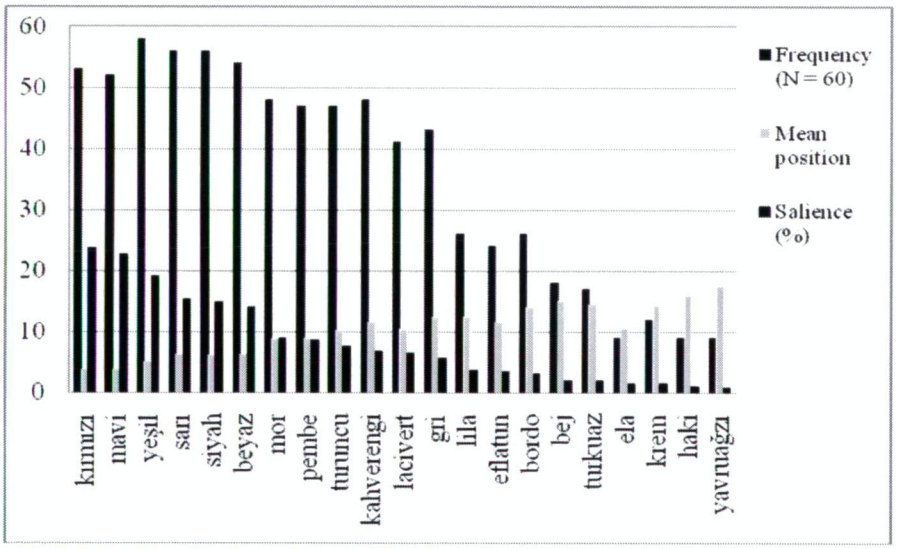
Term	Gloss	Fr	%	Rank	Mp	Rank	Salience	Rank
siyah	black	56	93.3	2.5	6.27	5	0.1489	5
beyaz	white	54	90.0	4	6.43	6	0.1400	6
mor	purple	48	80.0	7.5	8.90	7	0.0899	7
pembe	pink	47	78.3	9.5	9.04	8	0.0867	8
turuncu	orange	47	78.3	9.5	10.28	11	0.0762	9
kahverengi	brown	48	80.0	7.5	11.56	17	0.0692	10
lacivert	dark blue	41	68.3	12	10.46	12	0.0653	11
gri	grey	43	71.7	11	12.44	24	0.0576	12
lila	lilac	26	43.3	13.5	12.35	23	0.0351	13
eflatun	mauve	24	40.0	15	11.63	18	0.0344	14
bordo	bordeaux	26	43.3	13.5	14.08	28	0.0308	15
bej	beige	18	30.0	16	15.11	34	0.0199	16
turkuaz	turquoise	17	28.3	17	14.53	30	0.0195	17
ela	hazel	9	15.0	20.5	10.56	13	0.0142	18
krem	cream	12	20.0	18	14.42	29	0.0139	19
haki	khaki	9	15.0	20.5	16.00	37.5	0.0094	20
yavruağzı	baby-mouth	9	15.0	20.5	17.44	43	0.0086	21
açık mavi	light blue	6	10.0	27.5	12.50	25	0.0080	22
gök mavisi	sky-blue	7	11.7	24.5	15.00	32.5	0.0078	23.5
fıstık yeşili	pistachio-green	8	13.3	22	17.00	42	0.0078	23.5
kızıl	scarlet	7	11.7	24.5	16.00	37.5	0.0073	25
leylak	lilac	4	6.7	39	9.25	9	0.0072	26
açık pembe	light pink	5	8.3	32	12.00	21.5	0.0069	27.5
koyu yeşil	dark green	5	8.3	32	12.00	21.5	0.0069	27.5
açık yeşil	light green	4	6.7	39	9.75	10	0.0068	29
kavuniçi	inner part of melon	6	10.0	27.5	15.33	35	0.0065	30
kiremit rengi	tile colour	6	10.0	27.5	15.67	36	0.0064	31
deniz mavisi	sea-blue	5	8.3	32	13.80	27	0.0060	32
koyu kırmızı	dark red	4	6.7	39	11.75	20	0.0057	33
fuşya	fuchsia	5	8.3	32	14.80	31	0.0056	34
vişneçürüğü	rotten sour cherry	7	11.7	24.5	22.43	52	0.0052	35
fildişi	ivory	3	5.0	48.5	11.00	14.5	0.0045	37

Term	Gloss	Fr	%	Rank	Mp	Rank	Salience	Rank
menekşe	violet	3	5.0	48.5	11.00	14.5	0.0045	37
füme	smoke	5	8.3	32	18.40	46	0.0045	37
gülkurusu	dusty rose	3	5.0	48.5	11.33	16	0.0044	39.5
parlament mavisi	parliament-blue	4	6.7	39	15.00	32.5	0.0044	39.5

A more precise indicator of basicness is the cognitive salience index of Sutrop, which combines two list task parameters – frequency and mean position – independently of how long the list in question is. It is therefore possible to compare different results as it does not depend on the length of the individual lists (Sutrop 2001: 263). The ideal most salient term has the cognitive salience index 1 and the term not mentioned at all the index 0. For the purposes of better visibility in Figure 1 the index was multiplied by 100. Its calculation formula is: S = F / (N x mp), where S – cognitive salience index, F – frequency of use in the list task, N – number of subjects, mp – mean position.

According to the cognitive salience index (see Figure 1) the most salient terms in Turkish are the following 12 colour terms: *kırmızı* 'red', *mavi* 'blue', *yeşil* 'green', *sarı* 'yellow', *siyah* 'black', *beyaz* 'white', *mor* 'purple', *pembe* 'pink', *turuncu* 'orange', *kahverengi* 'brown', *lacivert* 'dark blue' and *gri* 'grey'.

Figure 1. The most salient colour terms in Turkish list task (ranked by salience)



Somewhat remarkably *lacivert* 'dark blue' (cognitive salience index 0.0653) holds the 11th position instead of predictable basic colour term *gri* 'grey'.

To compare the results of the Turkish and Russian results the cognitive salience index from Davies and Corbett data (1994: 73) was calculated. For example, *goluboj* 'light blue' cognitive salience index (0.126) is calculated by dividing its frequency (73) with the multiplication of the number of subjects (77) and its mean position (7.50). According to the

index *goluboj* 'light blue' is ranked fifth after *krasnyj* 'red' (0.293), *sinij* 'blue' (0.160), *želtyj* 'yellow' (0.159) and *zelenyj* 'green' (0.153).

Regrettably, Özgen & Davies (1998: 943) have not provided list task mean position in their article, only their mean position ranking, so it is not possible to calculate cognitive salience index from their results and compare the two Turkish fieldwork data.

5.2. Colour naming task

Table 2 shows the total frequency, dominant frequency, number of tiles the term in question was the most frequently named term (nmf), and the specificity index (SI) for the most common terms in the naming task ranked by the total frequency. Specificity index (SI) is a ratio of the total frequency of use for each term and the total frequency for those tiles that a term was dominant (Davies & Corbett 1995: 79), i.e. dominance frequency divided by the total frequency. The most common terms are ranked by their total frequency. The term *hardal sarısı* 'mustard-yellow' did not have the required total frequency and was left out of Table 2, but it was nevertheless named most frequent for Color-aid tile YOY S2.

Table 2. The most common colour terms in the colour naming task
nmf – term named most frequent, SI – specificity index

Term	Gloss	Total frequency	Dominant frequency	nmf	SI
yeşil	green	241	67	6	0.278
mor	purple	174	110	5	0.632
mavi	blue	152	109	3	0.717
kahverengi	brown	149	62	5	0.416
gri	grey	143	99	4	0.692
pembe	pink	135	31	7	0.230
kırmızı	red	130	80	3	0.615
açık yeşil	light green	119	-	4	-
turuncu	orange	114	70	5	0.614
sarı	yellow	105	82	2	0.781
koyu yeşil	dark green	99	-	3	-
siyah	black	98	94	2	0.959
koyu pembe	dark pink	63	-	1	-
açık pembe	light pink	59	-	1	-
beyaz	white	56	40	2	0.714
koyu mavi	dark blue	53	-	1	-

Term	Gloss	Total frequency	Dominant frequency	nmf	SI
lila	lilac	51	-	2	-
eflatun	mauve	50	-	-	-
yavruağzı	baby-mouth	50	-	2	-
lacivert	dark blue	49	-	1	-
açık mavi	light blue	45	-	2	-
açık gri	light grey	38	-	-	-
kavuniçi	inner part of melon	37	-	-	-
koyu sarı	dark yellow	32	-	-	-
turkuaz	turquoise	32	-	-	-
açık mor	light purple	30	-	-	-
şampanya	champagne	30	-	-	-
açık sarı	light yellow	29	-	2	-
kiremit rengi	brick colour	28	-	1	-
koyu kahverengi	dark brown	28	-	-	-
bej	beige	27	-	1	-

Here the most accurate indicator for basicness is specificity index (SI), which shows not only how many times a term was used, but also how high was the consensus, e.g. *yeşil* 'green' has the highest total frequency (241), but the ratio (SI) of dominance frequency (67) and total frequency is very low (0.278) ranking tenth and placing only in front of *pembe* 'pink', which has the lowest SI. Comparing it to *siyah* 'black' (total fr-quency 98, dominant frequency 94) or *beyaz* 'white' (total frequency 56, dominant frequency 40) one can see how SI shows the level of consensus among subjects. Ranked according to the specificity index the 11 terms, which attained dominancy among 65 stand-ard tiles are: *siyah* 'black', *sarı* 'yellow', *mavi* 'blue', *beyaz* 'white', *gri* 'grey', *mor* 'pur-ple', *kırmızı* 'red', *turuncu* 'orange', *kahverengi* 'brown', *yeşil* 'green' and *pembe* 'pink'.

The most probable basic colour terms in Turkish based on tile naming task dominance are those already shown by specificity index, but ranked in order of dominance percentage: *siyah* 'black' (≥ 90% dominance), *sarı* 'yellow', *mavi* 'blue', *mor* 'purple', *kırmızı* 'red' (≥ 75% dominance), *beyaz* 'white', *gri* 'grey', *turuncu* 'orange', *kahverengi* 'brown', *yeşil* 'green', and *pembe* 'pink' (≥ 50%).

5.2.1. Additional tiles results for the blue region

Standard tile BV HUE was named *lacivert* 'dark blue' in 22 instances, which amounted to 39% consensus, but that was not enough to gain dominancy (for which a frequency equal

or surpassing 28 was required). Therefore it was not listed among dominant terms as a dominant term is that given by 50% or greater of subjects. The standard tile in question could be considered exceptional as Özgen & Davies's results (1998: 937) show a staggering 94% consensus identificating it *lacivert* 'dark blue', thus suggesting that the term has some claim to basicness.

My subjects were far less consenting by giving the tile in question 22 different names, most often *lacivert* 'dark blue' (39%), *mor* 'purple' (24%), *koyu mor* 'dark purple' (7%), *eflatun* 'mauve' (4%), *koyu mavi* 'dark blue' (4%), or *mavi* 'blue' (4%).

In comparison, additional tile B S3 was named *lacivert* 'dark blue' by over a half of subjects (52%), consequently making it a dominant colour term. This could be seen as a indicator that the most probable foci for *lacivert* 'dark blue' is not among the 65 standard tiles used by Özgen and Davies (1998).

Four additional tiles gained dominancy in the naming task: *lacivert* 'dark blue' (SI 0.758), *açık mavi* 'light blue' (SI 0.718), *mavi* 'blue' (SI 0.642) and *mor* 'purple' (0.576). The latter two basic colour terms also emerged dominant among the standard tiles (see Table 2), but with lower specificity index. Among the additional tiles the highest specificity index did not belong to basic colour terms, but remarkably to *lacivert* 'dark blue' (overall ranking third in terms of specificity) and *açık mavi* 'light blue' (ranked fourth). The last term contains the modifier *açık* 'light' violating Berlin & Kay non-inclusion criteria.

However, *lacivert* 'dark blue' has a high specificity index even compared to Russian *goluboj* 'light blue', which ranked 11th by the specificity index (0.571) calculated from the results of Davies & Corbett (1994: 79).

5.3. Combined analysis

The sum of basic colour terms criteria thresholds shown in Table 3 were selected due to a visible decline in the required frequencies, e.g. list task frequency dropped from 41 for *lacivert* 'dark blue' to 26 for *lila* 'lilac', mean position from 6.43 for *beyaz* 'white' to 8.90 for *mor* 'purple' (see Table 1); naming task frequency from 98 for *siyah* 'black' to 63 for *koyu pembe* 'dark pink' (Table 2). Dominance was seen as a 50% consensus demonstrated by subjects and only the dominant terms attained a specificity index.

The most salient colour terms according to the sum of basic colour term criteria in Turkish are presented in Table 3. These are *yeşil* 'green', *sarı* 'yellow', *siyah* 'black', *kırmızı* 'red' and *mavi* 'blue' meeting all 5 criteria. With 4 criteria fulfilled *beyaz* 'white', *mor* 'purple', *kahverengi* 'brown', *pembe* 'pink', *turuncu* 'orange' and *gri* 'grey' are next in line. *Lacivert* 'dark blue' is in the 12th place with 1 threshold, i.e. list task frequency superseded, and even taking into account the additional tile B-S3, which attained dominance thus making the sum of criteria attained by this term 3, it would still place *lacivert* 'dark blue' in the position of a probable basic colour term candidate, and not a fully developed basic colour term.

Table 3. Sum of basic colour terms criteria
Fr – frequency, mp – mean position, DI – dominance index, SI – specificity index

Term	Gloss	List task		Naming task			Sum of criteria
		Fr > 40	mp < 7	Fr > 90	DI 1/2 > 1	SI > 0.2	
yeşil	green	+	+	+	+	+	5
sarı	yellow	+	+	+	+	+	5
siyah	black	+	+	+	+	+	5
kırmızı	red	+	+	+	+	+	5
mavi	blue	+	+	+	+	+	5
beyaz	white	+	+	-	+	+	4
mor	purple	+	-	+	+	+	4
kahverengi	brown	+	-	+	+	+	4
pembe	pink	+	-	+	+	+	4
turuncu	orange	+	-	+	+	+	4
gri	grey	+	-	+	+	+	4
lacivert	dark blue	+	-	-	*	*	1 (3)
açık yeşil	light green	-	-	+	-	-	1
koyu yeşil	dark green	-	-	+	-	-	1
açık mavi	light blue	-	-	-	*	*	(2)

*- dominance and specificity indexes emerging from the additional tiles (sum of criteria including additional tiles results in brackets)

The terms with modifiers, e.g. *açık yeşil* 'light green', *koyu yeşil* 'dark green' and *açık mavi* 'light blue' are not applicable as basic colour terms even if most of their values were high enough to suggest such. The first two surpassed only the naming task frequency criteria, while the third modified term *açık mavi* 'light blue' emerged dominant in additional tiles.

6. Discussion

The position of *lacivert* 'dark blue' as a probable candidate for basicness is fairly certain, but there is some discussion of whether or not it could be considered the 12th Turkish basic colour term. Özgen and Davies conclude their article by commenting that the safest conclusion is that Turkish has 11 basic colour terms:

> "Thus we have the unusual, but logically possible, case of a term being used with prevalence, consensus, and specificity, while at the same time being acknowledged as a subset of another term." (1998: 919)

Whereas Davies & Corbett' (1994) list and colour naming task results indicate that Russian has 12 basic colour terms, including *goluboj* 'light blue' with Color-aid tile BGB T3 attaining 72% consensus among subjects.

The research done by Ian Davies et al. (2006) on Modern Greek basic colour terms suggests that there are two terms for blue, including [yalázjo] 'light blue'. While comparing the referents of three pairs of exceptional blues in Greek, Russian and Turkish they claim that the main distinction between them lies in lightness:

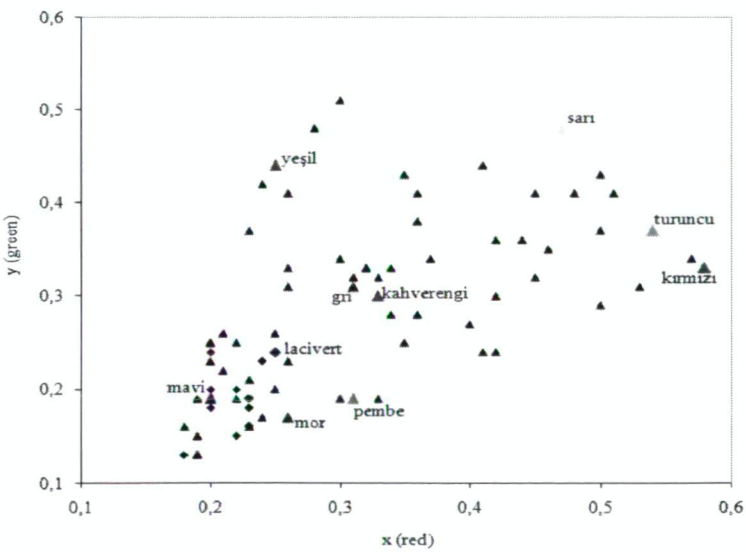
> "On average, *sinij* "dark blue" denotes darker colours than [blé] "blue", and *lacivert* "dark blue" is even darker. Comparing the Russian and Turkish terms to the landmark BLUE reveals that *goluboj* "light blue" has on average about the same lightness as BLUE but *mavi* on average is darker than BLUE." (2006: 38)

Rather than cling to the definition of basic colour term they propose a different approach suggesting that "category formation involves the interaction of chromatic and achromatic mechanisms" (Davies et al. 2006: 39).

On the other hand, their research reduces the importance of different stimuli, reporting that "precise control over these variables is not crucial in field studies aimed at establishing a language's basic colour terms" (2006: 39). This can be seen as a small setback for this research, as the most dominant tile for the Turkish *lacivert* 'dark blue' was an additional tiles attaining 52% consensus (see Figure 2), while the standard tiles had a relatively low dominance of 39% in the naming task.

While *lacivert* 'dark blue' would have been considered basic by Özgen & Davies (1998) as it emerged dominant in both list and colour naming task if not for the fact that according to their third experiment it violates Berlin & Kay's non-inclusion criteria. This researcher believes that the position of *lacivert* 'dark blue' remains that of a basic colour term candidate due to the low consensus in the colour naming task.

Figure 2. The foci of 80 Color-aid tiles (C.I.E. coordinates measured by Davies & Corbett)



7. Conclusion

I consider the following 11 terms to be basic in Turkish: *yeşil* 'green', *sarı* 'yellow', *siyah* 'black', *kırmızı* 'red', *mavi* 'blue', *beyaz* 'white', *mor* 'purple', *kahverengi* 'brown', *pembe* 'pink', *turuncu* 'orange' and *gri* 'grey'. In any case the consensus in the colour naming task for *lacivert* 'dark blue' (either 39% for BV HUE from a selection of 65 Color-aid tiles or 52% for tile B S3 from additional tiles) was unexpectedly low for it to be a fully-developed basic colour term. The low consensus in the colour naming task suggests that the claim of *lacivert* 'dark blue' to basicness is not as firm as previously thought.

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TDK = Türk Dil Kurumu Sözlükler [The Turkish Language Society Dictionaries] at *tdk.org.tr*