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THE BASIC COLOUR TERMS OF ESTONIAN

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Abstract. There are exactly 11 basic colour terms in Estonian: *valge* 'white', *must* 'black', *punane* 'red', *kollane* 'yellow', *roheline* 'green', *sinine* 'blue', *pruun* 'brown', *hall* 'grey', *roosa* 'pink', *lilla* 'purple', and *oranž* 'orange'. This corresponds to the fully developed Berlin and Kay's Stage VII colour system. Estonian encodes the basic colour terms in the universal way predicted by the theory of Berlin and Kay.

1. Introduction

Before Brent Berlin and Paul Kay published their *Basic color terms: their universality and evolution* in 1969 (BCT) numerous laws and regularities on the colour vocabulary development were known. Berlin and Kay's theory of the evolution of the basic colour terms is methodologically and theoretically different from the former concepts and theories about colour. Berlin and Kay introduced the typological approach into their theory of the colour term evolution and used a strict logical form for colour implications.

Berlin and Kay start with the statement that their study was originally designed as an experimental test of the prevailing extreme linguistic relativity doctrine of American linguists and anthropologists – the hypothesis of Sapir and Whorf. (BCT: 1, Kay & Kempton 1984) Contrary to this prevailing doctrine, Berlin and Kay showed that there are semantic universals in language. They pointed out that there are eleven basic colour categories *white, black, red, green, yellow, blue, brown, purple, pink, orange,* and *grey*. They continued: "A second and totally unexpected finding is the following. If a language encodes fewer than eleven basic color categories, then there are strict limitations on which categories it may encode". (BCT: 2) Berlin and Kay also proposed that there are few languages having more than 11 basic colour terms. They argued, for instance, that Russian possesses two basic terms for blue region and Hungarian may possess two basic terms for red region.

Berlin and Kay showed that the evolutionary ordering and the encoding of the basic colour terms follow some limited paths in every language, i.e. are invariant rather than variant. Figure 1 presents a modified temporal-evolutionary ordering of basic colour terms. This shows the temporal order in which basic colour terms will be added into a colour system.

		a [grue] →	[yellow]			
[white black]	→ [red] →	b [yellow] →	[grue] →	[green blue yellow]	→ [brown] →	[purple pink orange grey]
		c [yellow-green] →	[green]			
I.	II.	III a/b.	IV.	V.	VI.	VII.
		III c.	IV'			

Figure 1. Modified temporal-evolutionary ordering of basic colour terms. The Roman numbers indicate the corresponding evolutionary stages (after Kay 1975).

Berlin and Kay defined a basic colour term as follows. They discriminated between primary and secondary characteristics of a basic colour term. The original four primary characteristics for defining a basic colour term are:

(i) It [the term] is *monolexemic*; that is, its meaning is not predictable from the meaning of its parts.
(ii) Its signification is not included in that of any other colour term.
(iii) Its application must not be restricted to a narrow class of objects.
(iv) It must be psychologically salient for informants. Indices of psychological salience include, among others:
  (1) a tendency to occur at the beginning of elicited lists of colour terms,
  (2) stability of reference across informants and across occasions of use, and
  (3) occurrence in the idiolects of all informants.

And the four subsidiary criteria are:

(v) The doubtful form should have the same distributional potential as the previously established basic terms.
(vi) Colour terms that are also the name of an object characteristically having that colour are suspect.
(vii) Recent foreign loan words may be suspect.
(viii) In cases where lexemic status is difficult to access, morphological complexity is given some weight as a secondary term (BCT: 6–7).

To simplify matters, a "basic colour term is a psychologically salient, in most cases morphologically simple and native word, which belongs to the same word class and has the same grammatical potential as the prototypical colour term(s). That term denotes a quality of colour at the basic level, and is applicable in all relevant domains" (Sutrop 2000).

Although the theory of Berlin and Kay (BCT) about the universal nature of the colour term's systems is generally accepted, there are also some critical notes in linguistic literature. For example, MacLaury, who is one of the most important opponents of the universalist theory of Berlin and Kay, has presented his own *vantage theory* of the colour vocabulary development (1995, 1997).

On the other hand, there is a group that denies all aspects of Berlin and Kay's theory and methodology in linguistics and anthropology. In reviewing Berlin and Kay's methodology and nature of their data, Durbin, for example, concluded that "the circumstances under which these studies were made compel one to say that the reliability and validity of the experiments are zero" (1972: 259). Recently this group has culminated in a *Behavioral and Brain Sciences'* target article with 31 open peer commentaries (Saunders & Brakel 1997).

Various tests and techniques for establishing basicness of colour terms are compared in Corbett and Davies (1997). The state of the art of the colour science is presented in (Kaiser & Boynton 1996, Byrne & Hilbert 1997, Hardin & Maffi 1997). Recent critical discussion of colour names and categories is in (Saunders & Brakel 1997).

Berlin and Kay assumed that there is a positive correlation between general cultural complexity (and/or level of technological development) and complexity of colour vocabulary. They wrote that "all the languages of highly industrialized European and Asian peoples are Stage VII, while all representatives of early Stages (I, II, and III) are spoken by peoples with small populations and limited technology, located in isolated areas". (BCT: 16)

According to this remark one can suppose that Estonian colour vocabulary has reached Stage VII. At that stage there are at least eight basic colour terms in every language. In addition to white, black, red, yellow, green, blue, and brown (Stage VI terms) there are also purple, orange, grey, and pink or any combination of them.

The task of this paper is to find out whether Estonian encodes the basic colour terms in the universal way predicted by Berlin and Kay or not. For the empirical case study 80 interviews were held. In the following studies the collected data will be analysed. Next the basic colour terms of Estonian will be calculated from the salient colour terms. Both linguistic and cognitive methods will be used in this paper. It will be asked whether Estonian has reached Stage VII as predicted by the theory of Berlin and Kay. If so, it will also be questioned whether Estonian possesses the full set of the Stage VII basic colour terms or the Stage VI terms plus some combination of grey, pink, orange, and violet.

The main theoretical basis for this study is Lenneberg's *Biological Foundation of Language* and his methodological approaches (Lenneberg & Roberts 1956), Berlin and Kay's universalistic theory of basic colour terms (BCT, Kay 1975, Kay & McDaniel 1978, Kay, Berlin & Merrifield 1991, Kay, Berlin, Maffi & Merrifield 1997), and Davies and Corbett's field method for investigating basic colour terms. (Davies & Corbett 1994a, Corbett & Davies 1997) Some preliminary results of this study have been published earlier in Estonian. (Sutrop 1995)

2. Case study: Estonian colour terms

Language: Estonian, Finnic, Finno-Ugric.
Regions where data have been collected: Tallinn and Tartu, Estonia.
Dates: From March 19th 1995 to April 5th 1995.
Subjects: There were 80 subjects in all, 27 men and 53 women, whose age ranged from 9 to 72 years with a mean of 29 years. The age of men ranged from 9 to 67 years with a mean of 32 years and the age of women ranged from 16 to 72 years with a mean of 27 years.

All were native speakers of Estonian, having different dialect background: two of them were Estonian-Russian bilinguals. All subjects had a normal colour seeing ability. All subjects did the colour-name list task first and then the colour naming task. The experimenter spoke Estonian with the subjects.

2.1. Methods

The field method of Davies and Corbett consists of two – the list and the colour naming – tasks. (Davies & Corbett 1994a, Corbett & Davies 1997) Here an attempt was made to follow the same methodological and theoretical procedures. The method used by Berlin and Kay is quite different and complicated because controlled light conditions were required and it took several hours to map all the basic terms on the colour chart with 329 chips. The main disadvantage of this method is that each informant must perform the mapping procedure at least three times, at one-week intervals (see BCT: 7). It follows that Berlin and Kay had only very few informants (sometimes only one) per language. Now it is generally accepted (*World Color Survey*) that at least 25 informants are needed for colour survey. Because the field method of Davies and Corbett is not so complicated, it is possible to conduct more interviews in a short period.

List task gives two independent parameters. First the frequency of a term and second the mean position of that term will be calculated. These two parameters are integrated into an original cognitive salience index in this paper. Also an original complexity index of a term/the terms will be introduced.

The City University Colour Vision Test. At first colour seeing ability was controlled in every case. The test consists of ten plates, each consisting of a colour spot and four surrounding spots. The subjects were asked to point the surrounding spot that is most like the centre spot. This is a quick and simple test for colour vision which produces preliminary indication of any colour vision anomalies (Fletcher 1980).

The list task. The subjects were asked to say as many colour names as they knew. All terms were written down in the order the subjects listed them.

A cognitive salience index. In that index the two list task parameters—frequency and mean position of a term—are integrated into one integral parameter. The salience index introduced in this paper is different from the free-list salience index (Smith et al. 1995: 206, Smith & Borgatti 1997). If the free-list salience index is calculated over individual lists, then salience index for a term is calculated from its frequency and mean position. This index can be used for discriminating basic terms from non-basic terms (see Sutrop 1998).

Salience index introduced in this paper is based on the important characteristics (iv) of the basic colour term according to which the basic term must be psychologically salient for informants. This index combines the tendency of a basic term to occur at the beginning of the elicited lists (mean position (mP)) and its occurrence in the idiolects of all informants (term frequency (F)) into one integral parameter. If N is the number of informants and L is the mean length of the individual lists, then the salience (S) is a product of two factors:

$$S = (F / N) \times [(L - mP) / (L - 1)]$$

The first factor of the salience F / N considers the frequency (F) a term was named in the list task. If all informants have named a term (i.e. F = N), then this factor for that term is one. The second factor of the salience (L – mP) / (L – 1) considers the weight of the mean position (mP) the term was named. If the mean position is one, this factor is also one.

The ideal basic term that is psychologically most salient, has the value one for both factors, so the product S would also be one. If the parameter mean position (mP) for some term is equal to the mean length of the list (L), i.e. mP = L, then the value for our salience index S = 0; and if the mean position of a term is greater than the mean length of the individual lists, then the salience index has negative figure (S < 0) (see Sutrop 1998, 2000).

The frequency, mean position and integral salience are all good criteria for discriminating basic terms from non-basic terms. Sometimes the discrimination must be made between more and less basic terms. In such cases the linguistic criteria can well be applied.

The complexity index. The complexity index C.I. counts independent words in a term but ignores its morphological complexity, e.g. yellowy or bluish. The complexity index is calculated in the following way: C.I. = P/N, where P is the number of simple (although possibly morphologically complex) words in terms (compounds) and N is the number of terms, e.g. if we have three terms: green, red, and yellowy, then P = N and C.I. = 3/3 = 1, but if we have yellow-green, red, and green, then P = 4 and N = 3; C.I. = 4/3 = 1.33. One can calculate the complexity index for a term or group of terms.

The colour naming task. This involves showing the subject all 65 colour-squares, one square at a time, in a random sequence. The order was different for each subject, the colours were shown in good daylight on a grey base. She or he was asked to name the colour of the tiles.

Stimuli. In the colour naming task 65 tiles were used as stimuli. Each tile was 5 cm rigid wooden square covered with coloured paper. These colours were chosen from Color-Aid Corporation range of colour papers using the Ostwald's colour system. (Ostwald 1939) This system is analysed in Foss et al. (1944) The rationale for colour sample selection can be found in Davies et al. (1992) The Color-Aid codes and CIE (*Commission Internationale de l'Eclairage*) coordinates for colour tiles can be found in Davies & Corbett 1994a. The table that converts CIE coordinates into Munsell codes can be found in Newhall et al. (1943)

Note. In this paper some rules of the Estonian orthography will be ignored. Simple terms (although sometimes morphologically complex or derived) in colour compounds are separated with hyphens and modificators, e.g. *hele* 'light' and *tume* 'dark' are hyphenated with the main term for the sake of clarity and automatic processing.

3. Colour terms: results

3.1. The list task

In the list task the subjects named 1,515 terms in all (C.I. = 1.40), among these there were 285 different terms (C.I. = 1.78). Every subject listed some colour names very rapidly and after that she or he made a short pause to remember more colour names. Sometimes such pauses were numerous. In every case the terms named until the first pause and after the first pause were recorded separately.

Until the first pause the subjects named 869 (C.I. = 1.25) and after that 646 (C.I. = 1.61) colour terms. Among these were 115 (C.I. = 1.72) different colour terms until the first pause and 170 (C.I. = 1.82) different colour terms after that. Every subject named as a mean 18.94 colour terms; 8.08 terms until the first stop and 10.86 terms after that.

The total number of times the subjects offered each colour term was calculated, together with the mean across subjects of the serial position in the lists and the salience index for each term. The results before the first pause are not shown. The total results for those terms that were offered by at least four people are shown in Table 1, ordered by the rank of salience index.

Table 1.

Frequency, mean position, and their corresponding rank orders for colour terms offered by four or more subjects in the list task. Fr – frequency, MP – mean position, S – salience, and R – rank of frequency, of mean position, or salience, respectively.

Term	Gloss	Fr	R	MP	R	S	R
sinine	blue	71	2	3.66	1	0.756	1
punane	red	71	2	4.46	2	0.716	2
kollane	yellow	71	2	6.07	4	0.637	3
roheline	green	69	4.5	5.75	3	0.634	4
must	black	69	4.5	7.13	5	0.568	5
valge	white	66	7	7.74	6	0.515	6
oranž	orange	68	6	9.79	13	0.433	7
lilla	lilac, purple	58	9	8.82	9	0.409	8
pruun	brown	52	11.5	9.71	12	0.334	9
roosa	rose, pink	53	10	11.24	19	0.284	10
beež	beige	52	11.5	11.44	21	0.271	11
hall	grey	64	8	13.80	31	0.229	12
hele-sinine	light-blue	28	13	7.82	7	0.217	13
tume-sinine	dark-blue	22	14.5	9.90	14	0.139	14
violetne	violet, purple	15	19	8.73	8	0.107	15
violett	violet, purple	14	21	9.50	11	0.092	16
tume-roheline	dark-green	14	21	11.35	20	0.074	17
hele-roheline	light-green	16	18	12.50	27	0.071	18
tume-punane	dark-red	22	14.5	15.04	40	0.060	19
hele-kollane	light-yellow	10	27	10.90	18	0.056	20
hele-punane	light-red	17	16.5	14.35	37	0.054	21
mere-sinine	marine-blue	11	25.5	12.36	25	0.050	22
poti-sinine	pot's blue = indigo-blue	7	35	10.00	15	0.044	23
taeva-sinine	sky-blue	13	23.5	14.30	35	0.042	24.5
hallikas-sinine	greyish blue	6	42.5	9.00	10	0.042	24.5
mere-roheline	sea-green	7	35	10.85	17	0.039	26
purpur	purple	8	30	12.50	27	0.036	27
veri-punane	blood-red	8	30	13.75	30	0.029	28
tume-kollane	dark-yellow	11	25.5	15.54	43	0.026	30
bordoo-punane	claret-red, < Bordeaux	7	35.5	13.57	29	0.026	30
sinakas-roheline	bluish-green	5	50	11.60	22	0.026	30
rohekas-sinine	greenish-blue	4	63	10.75	16	0.023	32
sambla-roheline	moss-green	17	16.5	17.05	47	0.022	33
purpur-punane	purple(-red)	6	42.5	14.00	32.5	0.021	34
purpurne	purple	4	63	11.75	23.5	0.020	35.5
türkiis	turquoise	4	63	11.75	23.5	0.020	35.5
ruuge	light-brown, dark-yellow	6	42.5	14.33	36	0.019	37
taevas-sinine	sky-blue	4	63	12.50	27	0.018	38
hele-pruun	light-brown	9	28	16.22	44	0.017	39.5
sinakas-hall	bluish-grey	5	50	14.00	32.5	0.017	39.5
türkiis-sinine	turquoise-blue	5	50	14.40	38	0.016	41
sidruni-kollane	lemon-yellow	6	42.5	15.50	42	0.014	42
hõbe	silver	4	63	14.25	34	0.013	43
ooker	ochre, ochrous	7	35.5	16.57	45	0.012	44
lehe-roheline	leaf-green	4	63	15.00	39	0.011	45

Table 1 continued

Term	Gloss	Fr	R	MP	R	S	R
hele-hall	light-grey	4	63	15.25	41	0.010	46
hele-roosa	light-pink	7	35.5	17.14	48	0.009	47
kirsi-punane	cerise-red	14	21	18.14	54	0.008	48
kuldne	golden, aureate	13	23.5	18.15	55	0.007	49.5
mürk-roheline	poison-green	6	42.5	17.16	49	0.007	49.5
rohu-roheline	grass-green	4	63	16.75	46	0.006	51
lõhe-roosa	salmon-pink	5	50	17.40	52	0.005	53
tibu-kollane	chicken-yellow	4	63	17.25	50.5	0.005	53
kuld-kollane	yellow-gold	4	63	17.25	50.5	0.005	53
vaarika-punane	raspberry-red	4	63	17.50	53	0.004	55
süsi-must	coal-black	5	50	18.20	56	0.003	56
vesi-hall	watery-grey	6	42.5	18.83	57	0.000	57
kastan-pruun	chestnut-brown = maroon	8	30	19.37	58	–0.002	60.5
vana-roosa	dusky pink	7	35.5	19.42	60	–0.002	60.5
lumi-valge	snow-white	5	50	19.40	59	–0.002	60.5
sireli-lilla	lilac-purple	5	50	19.60	63	–0.002	60.5
beebi-roosa	baby-pink	4	63	19.50	61.5	–0.002	60.5
karmiin-punane	crimson-red	4	63	19.50	61.5	–0.002	60.5
tume-pruun	dark-brown	7	35.5	20.14	64	–0.006	65
tume-hall	dark-grey	4	63	21.00	65	–0.006	65
kollakas-pruun	yellowish-brown	4	63	21.25	66	–0.006	65
lillakas-punane	purplish-red	5	50	21.60	68	–0.009	67.5
hallikas-valge	greyish-white	4	63	22.00	69	–0.009	67.5
punakas-pruun	redish-brown	5	50	22.20	70	–0.011	69
hõbedane	silver	7	35.5	21.57	67	–0.013	70
vein-punane	wine-red	4	63	25.25	71	–0.018	71

Before the first pause, the 11 standard basic terms plus the term *hele-sinine* 'light-blue' form the first 12 terms according to the salience index. According to the frequency measure the term *beež* 'beige' in the first group must also be considered. In total (Table 1) the 11 standard basic terms plus beige and light-blue are most salient according to the salience index.

The data of the mean position do not give such a clear picture. Only the six terms which correspond to the primary colour categories form the clear group when both terms named before and after the first pause are considered. From these data it is clear that the simple terms are more frequent and more salient. If the first dozen terms are simple then the following terms are mostly modified complex terms.

Next the arbitrary thresholds for every measure were calculated and the procedure described by Davies and Corbett (1994b) was followed. They introduced an all or nothing concept of basicness – if a term exceeds a threshold on a measure, it is basic; otherwise it is non-basic. In this paper that concept is abandoned. A preliminary study on colour terms suggested that it is more rational to define a basic term as follows: any term that has jumped more than one threshold, i.e. at least two hurdles, is basic (Sutrop 1995: 807). This technical definition of basicness has cognitive rather than linguistic character.

If one considers the terms which were named at least by half of the subjects (Fr≥ 40) then he or she has only 10 terms (*sinine* 'blue', *punane* 'red', *roheline* 'green', *kollane* 'yellow', *must* 'black', *valge* 'white', *lilla* 'purple', *oranž* 'orange', *pruun* 'brown', and *hall* 'grey') that had cleared the hurdle before the first pause, and 12 terms (11 standard terms and beige) totally. The total number of times these 10 terms were named – 545 – is over half of the total responses before the first pause. The total number of times these 12 terms were named – 764 – is also over half of the total responses.

According to the mean position there are 8 candidates (*punane* 'red', *sinine* 'blue', *roheline* 'green', *kollane* 'yellow', *hele-kollane* 'light-yellow', *must* 'black', *valge* 'white', and *hele-sinine* 'light-blue') before the first pause (M. P. < 6) and 7 candidates (light-yellow being excluded) totally (M.P. < 8) for basic status. After the list task there are 14 salient terms – candidates for basic status: 11 standard terms plus beige, light-blue, and light-yellow.

3.2. The colour naming task

In the colour naming task, the subjects gave to the 65 colour squares 5,197 names (C.I. = 1.59) in all, among these there were 638 different terms (C.I. = 2.17). There were 3 occasions where some subjects said that they did not know the name for some given tile. As a mean, 9.82 different names were given for each tile. The 14 candidates for basic status in the list task account for 45 % of the total responses in the tile naming task. They are used 2,343 times out of the total of 5,197.

Table 2 shows the most frequent terms given to each tile, together with the number of subjects, who used each term. Table 3 shows the most frequent terms used in the tile naming task, their total frequency, the number of tiles for which they were dominant, the number of tiles for which they were named at least once, the frequency/tile ratio. All dominant terms for any tile are with some minor exceptions also the most frequently used terms. The most curious exception is *lillakas-hall* 'purplish-grey' which was dominant for the tile ORO S3. But informants used 42 different names for this tile and the "dominant" term purplish-grey was used only 8 times.

The first 9 of the most frequent terms are simple. But it also must be noted that the terms *kollane* 'yellow' and *valge* 'white' take their position after some complex terms. The number of tiles for which a term was used at least once shows specificity and the extension of the colour terms in the colour space.

The final column frequency/tiles ratio shows the consensus of use. The higher the ratio the greater the consensus among subjects. Also it can be seen that the most frequent terms have greater consensus than other terms. According to the frequency measure (Fr > 150) there are 9 candidates for basic status: *roheline* 'green', *lilla* 'purple', *sinine* 'blue', *roosa* 'pink', *hall* 'grey', *oranž* 'orange', *must* 'black', *punane* 'red', and *pruun* 'brown'.

Table 2.

Distribution of most frequent terms and their corresponding frequencies in the tile naming task. Fr – frequency.

Code	Hue	Fr		Tint	Fr		Shadow	Fr
Y	kollane 'yellow'	52				S2	roheline 'green'	12
	ere-kollane 'bright yellow'	9					kollakas-roheline 'yellowish green'	9
							sambla-roheline 'moss-green'	9
YOY	kollane 'yellow'	14	T4	kollane 'yellow'	22	S2	hallikas-roheline 'greyish-green'	11
	oranž 'orange'	13		oranžikas-kollane 'orange-yellow'	12		roheline 'green'	9
	tume-kollane 'dark-yellow'	10					pruunikas-roheline 'brownish-green'	8
YO	oranž 'orange'	18	T3	oranž 'orange'	21	S3	roheline 'green'	17
	tume-kollane 'dark-yellow'	5		kollane 'yellow'	13		sambla-roheline 'moss-green'	10
							pruunikas-roheline 'brownish-green'	9
OYO	oranž 'orange'	56						
O	oranž 'orange'	28	S1	pruun 'brown'	24	S3	pruun 'brown'	59
	punane 'red'	13		hele-pruun 'light-brown'	14		tume-pruun 'dark-brown'	7
				punakas-pruun 'reddish-brown'	11			
ORO	punane 'red'	34	T3	roosa 'pink'	13	S3	lillakas-hall 'purplish-grey'	8
	hele-punane 'light-red'	11		oranž 'orange'	8		hall 'grey'	7
				kollakas-roosa 'yellow-pink'	7		beež 'beige'	6
RO	punane *'red'*	44	T3	roosa *'pink'*	27	S3	must *'black'*	28
	ere-punane 'bright-red'	8		roosakas-punane *'pinkish-red'*	10		tume-pruun *'dark-brown'*	18
	erk-punane *'bright-red'*	8					pruunikas-must *'brownish-black'*	9
							mustjas-pruun *'blackish-brown'*	8
ROR	punane *'red'*	46	T3	roosa *'pink'*	46	S3	lilla *'purple'*	19
	ere-punane *'bright-red'*	4		tume-roosa *'dark-pink'*	8		hele-lilla *'light-purple'*	9
	hele-punane *'light-red'*	4					lillakas-roosa *'purplish-pink'*	6

Table 2 continued

Code	Hue	Fr		Tint	Fr		Shadow	Fr
R	punane *'red'*	21	T4	roosa *'pink'*	35	S3	must *'black'*	24
	tume-punane *'dark-red'*	13		tume-roosa *'dark-pink'*	14		hallikas-must *'greyish-black'*	7
	lillakas-punane *'purplish-red'*	8					tume-lilla *'dark-purple'*	6
RVR	lilla *'purple'*	20	S1	lilla *'purple'*	40	S3	roosa *'pink'*	23
	lillakas-punane *'pinkish-red'*	10		punakas-lilla *'reddish-purple'*	6		lillakas-roosa *'purplish-pink'*	11
	punakas-lilla *'reddish-purple'*	10						
RV	lilla *'purple'*	43	T2	lilla *'purple'*	40			
	tume-lilla *'dark-purple'*	18		ere-lilla *'bright-purple'*	6			
	violett *'violet'*	6		hele-lilla *'light-purple'*	6			
VRV	lilla *'purple'*	34				S3	roosa *'pink'*	28
	tume-lilla *'dark-purple'*	13					lillakas-roosa *'purplish-pink'*	8
V	tume-lilla *'dark-purple'*	31						
	lilla *'purple'*	21						
VBV	tume-lilla *'dark-purple'*	22	T4	lilla *'purple'*	35			
	lilla *'purple'*	21		hele-lilla *'light-purple'*	15			
BV	tume-sinine *'dark-blue'*	42				S2	sinine *'blue'*	17
	sinine *'blue'*	11					hallikas-sinine *'greyish-blue'*	14
							sinakas-hall *'bluish-grey'*	11
BVB	sinine *'blue'*	28				S3	hele-lilla *'light-purple'*	34
	tume-sinine *'dark-blue'*	18					lilla *'purple'*	13
	lillakas-sinine *'purplish-blue'*	14					sireli-lilla *'lilac-purple'*	8
B	sinine *'blue'*	51	T1	sinine *'blue'*	34			
	hele-sinine *'light-blue'*	6		hele-sinine *'light-blue'*	26			
BGB	sinine *'blue'*	51	T3	hele-sinine *'light-blue'*	32			
	tume-sinine 'dark-blue'	18		sinine 'blue'	25			

Table 2 continued

Code	Hue	Fr	Tint	Fr	Shadow	Fr
BG	sinine *'blue'*	23	T1 sinine *'blue'*	23	S2 rohekas-sinine *'greenish-blue'*	18
	rohekas-sinine *'green-blue'*	17	hele-sinine *'light-blue'*	22	sinine *'blue'*	16
					mere-sinine *'sea-blue'*	8
					tume-sinine *'dark-blue'*	8
GBG	roheline *'green'*	46			S2 hele-sinine *'light-blue'*	30
	tume-roheline *'dark-green'*	12			sinine *'blue'*	20
G	roheline *'green'*	60			S3 tume-roheline *'dark-green'*	38
	tume-roheline *'dark-green'*	7			roheline 'green'	13
					sinakas-roheline *'bluish-green'*	7
GYG	roheline *'green'*	56	T4 roheline *'green'*	27	S1 roheline *'green'*	18
	tume-roheline *'dark-green'*	5	hele-roheline *'light-green'*	26	sinakas-roheline *'bluish-green'*	13
					hallikas-roheline *'greyish-green'*	13
					rohekas-sinine *'greenish-blue'*	9
YG	roheline *'green'*	44			S3 tume-roheline *'dark-green'*	29
	ere-roheline *'bright-green'*	6			roheline *'green'*	10
	lehe-roheline *'leaf-green'*	6				
YGY	roheline *'green'*	39			S3 hele-roheline *'light-green'*	38
	hele-roheline *'light-green'*	11			roheline *'green'*	13
					kahvatu-roheline *'pale-green'*	6

Rose Red	Fr	Sienna Brown	Fr
roosa 'pink'	12	pruun *'brown'*	58
lillakas-roosa *'purplish-pink'*	7	hele-pruun *'light-brown'*	10
tume-roosa *'dark-pink'*	7		
lillakas-punane *'purplish-red'*	7		

Table 2 continued

Code		Fr			Fr			Fr
White	valge *'white'*	67	Black	must *'black'*	71			
Grey 1	hall *'grey'*	32	Grey 4	hall *'grey'*	55	Grey 8	must *'black'*	54
	hele-hall *'light-grey'*	32		tume-hall *'dark-grey'*	16		hallikas-must *'greyish-black'*	10
Grey 2	hall *'grey'*	57	Grey 6	tume-hall *'dark-grey'*	35			
	hele-hall *'light-grey'*	9		hall *'grey'*	34			

Table 3.

The most frequent terms in the tile naming task, their total frequency, the number of tiles for which they were the most frequent terms, the number of tiles for which they were named at least once, and the frequency/tile ratio.

Term	Gloss	Occurrence in the list task	Total frequency	No. of domin. tiles	No. of tiles	Frequency/ no. of tiles
roheline	green	+	366	9	15	24.40
lilla	purple	+	308	7	16	19.25
sinine	blue	+	303	7	11	27.55
roosa	pink	+	189	7	9	21.00
hall	grey	+	187	3	7	26.71
oranž	orange	+	183	4	9	20.33
must	black	+	178	4	5	35.60
punane	red	+	172	4	11	15.64
pruun	brown	+	151	3	6	25.17
hele-sinine	light-blue	+	117	2	7	16.71
tume-sinine	dark-blue	+	111	1	10	11.10
tume-roheline	dark-green	+	106	2	10	10.60
kollane	yellow	+	105	3	6	17.50
tume-lilla	dark-purple	+	104	2	9	11.56
hele-roheline	light-green	+	83	1	7	11.86
hele-lilla	light-purple	+	76	1	10	7.60
valge	white	+	68	1	2	34.00
tume-hall	dark-grey	+	65	1	7	9.29
tume-roosa	dark-pink	+	60	0	13	4.62
rohekas-sinine	greenish-blue	+	51	1	6	8.50
lillakas-roosa	purplish-pink	+	44	0	8	5.50
sinakas roheline	bluish-green	+	44	0	10	4.40

Standard terms for yellow and white fall out on the ground of frequency. The low position of white may be explained with the fact that there was actually only one tile which was white. At the same time there were 9 tiles which dominantly were named green. Actually this white tile was not prototypically white for the speakers of Estonian. If it was shown on the snow-white background, the subjects had named this cream-coloured or grey. On standard grey background the tile got the following names: *valge* 'white' (67), *määrdunud-valge* 'dirty white' (2), *elevandiluu-valge* 'ivory-white' (1), *hallika-tooniga-valge* 'white with greyish tone' (1), *hele-hall* 'light-grey' (1), *kreemikas* 'cream' (1), *kreemikas-valge* 'cream-white' (1), *matjas-valge* 'dull-white' (1), *murtud-valge* 'broken-white' (1), *soe-valge* 'warm-white' (1), *tuhm-valge* 'dull-white' (1), *valkjas* 'whitish' (1), *valkjas-hall* 'whitish-grey' (1).

Table 4 shows the most frequent terms in the tile naming task, ordered according to their frequency/number of tiles ratio (ratio greater than 7.00) with their total frequency, dominance frequency, dominance index, and specificity index at the 50 % consensus level. At the 50 % consensus level a term is dominant if at least half of the subjects use the same name for a given tile. Here the dominance index shows the total number of tiles for which a term is dominant.

Table 4

The most frequent terms in the tile naming task, their frequency/tile ratio (if greater than 7.00), total frequency, dominance frequency, dominance index (D.I. ½) and specificity index.

Term	Gloss	Frequency/ no. of tiles	Total frequency	Dominance frequency	Dominance index	Spec. index
must	black	35.60	178	125	2	0.70
valge	white	34.00	68	67	1	0.99
sinine	blue	27.55	303	102	2	0.34
hall	grey	26.71	187	112	2	0.60
pruun	brown	25.17	151	117	2	0.77
roheline	green	24.40	366	206	4	0.56
roosa	pink	21.00	189	46	1	0.24
oranž	orange	20.33	183	104	2	0.57
lilla	purple	19.25	308	123	3	0.40
kollane	yellow	17.50	105	52	1	0.50
hele-sinine	light-blue	16.71	117	–	–	–
punane	red	15.64	172	90	2	0.52
hele-roheline	light-green	11.86	83	–	–	–
tume-sinine	dark-blue	11.60	111	42	1	0.38
tume-lilla	dark-purple	11.56	104	–	–	–
hele-hall	light-grey	10.75	43	–	–	–
tume-roheline	dark-green	10.60	106	–	–	–
tume-pruun	dark-brown	9.67	29	–	–	–
tume-hall	dark-grey	9.29	65	–	–	–
rohekas-sinine	greenish-blue	8.50	51	–	–	–
hele-lilla	light-purple	7.60	76	–	–	–
oranžikas-kollane	orangish-yellow	7.50	30	–	–	–

The specificity index is the dominant frequency/total frequency ratio at the same level. If the specificity index is 1, all subjects used the term only as the dominant term and there was absolute consensus among the subjects. (see Davies & Corbett 1994a: 79)

The frequency/number of tiles ratio shows that this ratio is greater for standard terms than for minor colour terms. Only the standard term *punane* 'red' has lower frequency/number of tiles ratio (rank 12) than the complex term *hele-sinine* 'light-blue' (rank 11).

It is possible to consider dominance and specificity indexes on different levels of consensus. In this study the following limits for dominant indexes (D.I.) will be used:

D.I.	1/10	1/4	1/3	1/2	2/3	3/4	1
Frequency pro tile	8	20	27	40	53	60	80

If at least 20 subjects named dominantly a tile with the same term, the dominant index is 1/4 in this study. In other words: this is at the 25 % consensus level. The corresponding specificity index (S.I. 1/4) is the dominance frequency (1/4)/total frequency ratio.

Table 5 shows the dominant colour terms on different consensus levels. If one looks at the very low consensus level (threshold D.I. 1/10) he or she can see that all 65 tiles have a dominant colour term. But only 21 colour terms are used as the most frequent term for any tile. On the other hand, there is no dominant colour term for any tile at the absolute consensus level (D.I. 1, not shown in Table 5). On the 25 % consensus level (D.I. 1/4) one can find 54 tiles with 18 dominant names. On the 33 % consensus level there are 45 tiles with the same 18 dominant names. Somewhat problematic is the tile GRAY 1 while the subjects named this *hall* 'grey' and *hele-hall* 'light-grey' both 32 times. Here only the first term (grey) was considered. On the 50 % consensus level (D.I. 1/2) there are 23 tiles with 12 dominant colour names. This level is most important for establishing basic colour terms in the naming task.

There are 12 candidates (11 standard terms plus *tume-sinine* 'dark-blue') for basic status on this level. If one looks at the specificity index it can be seen that there was a little more consensus of the term dark-blue than of the term blue itself. According to the already abandoned all or nothing concept (Davies & Corbett 1994b), *tume-sinine* 'dark-blue' is basic in Estonian. But it is not true. This will be discussed later.

On the next 67 % consensus level (D.I. 2/3) there are 10 tiles with only 6 different names. At the 75 % consensus level there are only three dominant tiles and names – *valge* 'white', *must* 'black, and *roheline* 'green'. If the specificity index at the 50 % consensus level will be studied there will be 8 candidates for basic status; the threshold S.I 1/2 > 0.40.

Table 5

Dominant colour terms in the tile naming task.
SI 1/2 – specificity index for D.I 1/2, DI – dominance index.

Term	Gloss	SI 1/2	DI 1/10	DI 1/4	DI 1/3	DI 1/2	DI 2/3	DI 3/4
valge	white	0.99	1	1	1	1	1	1
pruun	brown	0.77	3	3	2	2	2	0
must	black	0.70	4	4	3	2	2	1
hall	grey	0.60	3	3	3	2	2	0
oranž	orange	0.57	4	4	3	2	1	0
roheline	green	0.56	9	6	6	4	2	1
punane	red	0.52	4	4	3	2	0	0
kollane	yellow	0.50	3	2	1	1	0	0
lilla	purple	0.40	7	6	5	3	0	0
tume-sinine	dark-blue	0.38	1	1	1	1	0	0
sinine	blue	0.34	7	6	5	2	0	0
roosa	pink	0.24	7	5	4	1	0	0
hele-sinine	light-blue	–	2	2	2	0	0	0
hele-roheline	light-green	–	1	1	1	0	0	0
tume-lilla	dark-purple	–	2	2	1	0	0	0
tume-roheline	dark-green	–	2	2	2	0	0	0
hele-lilla	light-purple	–	1	1	1	0	0	0
tume-hall	dark-grey	–	1	1	1	0	0	0
rohekas-sinine	greenish-blue	–	1	0	0	0	0	0
hallikas-roheline	greyish-green	–	1	0	0	0	0	0
lillakas-hall	purplish-grey	–	1	0	0	0	0	0
			65	54	45	23	10	3

3.3. The combined results

In the list and naming tasks the subjects named 759 different colour terms (C.I. = 2.10). From the 285 different terms listed in the first list task, 121 were not used in the naming task. In the naming task the subjects used 474 new different colour names not listed in the first list task.

As a preliminary result, 15 salient candidates for basic status according to different tasks and measures have been established. The candidates are 11 standard terms: *valge* 'white', *must* 'black', *punane* 'red', *kollane* 'yellow', *roheline* 'green', *sinine* 'blue', *pruun* 'brown', *hall* 'grey', *roosa* 'pink', *lilla* 'purple', and *oranž* 'orange', plus 3 complex terms: *hele-kollane* 'light-yellow', *hele-sinine* 'light-blue', and *tume-sinine* 'dark-blue', plus 1 simple term: *beež* 'beige'.

In the following all previous results for establishing basic colour terms in Estonian will be combined. The results in the list task before the first pause will be compared with the whole results (terms named before and after the stop). The established basic terms will be ordered according to their basicness measure. At last the established basic colour terms in Estonian will be discussed.

Table 6 shows the summary of all independent results for the dominant terms in the tile naming task and for the most frequent terms in the naming task (whole results). The salience index is not included here because it depends on frequency and mean position of a term in the list task. In this table all 15 candidates for basic status are included.

Table 6

Summary of the results of the dominant terms in the tile naming task and for the most frequent terms in the list task. Fr – frequency, MP – mean position, DI – dominant index, SI – specificity index.

Term	Gloss	List task		Tile naming task			Sum
		Fr > 50	MP < 8	Fr > 150	DI 1/2 ≥ 1	SI > 0,40	Σ'
valge	white	+	+	–	+	+	4
pruun	brown	+	–	+	+	+	4
must	black	+	+	+	+	+	5
hall	grey	+	–	+	+	+	4
oranž	orange	+	–	+	+	+	4
roheline	green	+	+	+	+	+	5
punane	red	+	+	+	+	+	5
kollane	yellow	+	+	–	+	+	4
lilla	purple	+	–	+	+	–	3
tume-sinine	dark-blue	–	–	–	+	–	1
sinine	blue	+	+	+	+	–	4
roosa	pink	+	–	+	+	–	3
hele-sinine	light-blue	–	+	–	–	–	1
hele-roheline	light-green	–	–	–	–	–	0
tume-lilla	dark-purple	–	–	–	–	–	0
hele-hall	light-grey	–	–	–	–	–	0
tume-roheline	dark-green	–	–	–	–	–	0
hele-lilla	light-purple	–	–	–	–	–	0
tume-hall	dark-grey	–	–	–	–	–	0
tume-punane	dark-red	–	–	–	–	–	0
beež	beige	+	–	–	–	–	1
hele-kollane	light-yellow	–	–	–	–	–	0

It can be seen that all candidates for basic status except *hele-kollane* 'light-yellow' have cleared at least one threshold for basicness (Sum Σ'). Different terms have jumped over different number of hurdles. So the established basic terms could be ordered according to their basicness.

Now one can compare these results with the summary of the same results except one for the list task where the results before the first stop were considered (data not shown; sum Σ''). In this case the term *hele-kollane* 'light-yellow' has cleared one threshold but *beež* 'beige' has not. Sums (Σ' and Σ'') for other terms are similar in both cases. According to the technical definition of basicness, introduced here, a term is basic if it has jumped over more than one hurdle, i.e.

has jumped over at least two hurdles. Both sums (Σ' and Σ'') give the same basic terms. The results of the list tasks as a whole give 11 standard terms plus a term for beige as candidates for basic status whereas the results before the first pause give only 8 candidates for basic status.

It must be concluded that methodically it is not sufficient to collect only psychologically more salient data which subjects name in one breath (before their first pause). Only the whole list of terms is sufficient for establishing basic terms.

According to technical definition, a term is a basic colour term if it has cleared at least two thresholds, i.e. the sum of the cleared hurdles is greater than one ($\Sigma > 1$). It follows that there are exactly 11 basic colour terms in Estonian: *valge* 'white', *must* 'black', *punane* 'red', *kollane* 'yellow', *roheline* 'green', *sinine* 'blue', *pruun* 'brown', *hall* 'grey', *lilla* 'purple', *oranž* 'orange', and *roosa* 'pink'.

In Table 8 the rank orders on all measures for the terms having cleared at least 1 hurdle with the mean of the ranks, and the rank order of the means are shown. Here the rank orders of the means are compared with the salience index (list task), Berlin and Kay's rank order of the colour terms, and thresholds cleared in Table 8. The mean rank of all ranks correspond well with the sums of thresholds cleared. According to the rank of the means the first 11 terms are those with the basic status.

Table 7

Rank orders on all measures for the most frequent terms, the mean of the ranks, the rank order of the means, and "Berlin and Kay" rank order. Fr – frequency, MP – mean position, Fr/No – frequency/tile ratio, DI – dominance index (1/2), SI – specificity index (1/2), MR – mean rank, R – rank of the means.

Term	Gloss	List task (total)		Tile naming task				MR	R
		Fr	MP	Fr	Fr/No	DI	SI		
sinine	blue	2	1	3	3	5.5	11	4.26	2
kollane	yellow	2	4	13	10	10.5	8	7.92	9
punane	red	2	2	8	12	5.5	10	6.58	4
roheline	green	4.5	3	1	6	1	6	3.58	1
must	black	4.5	5	7	1	5.5	3	4.33	3
oranž	orange	6	13	6	8	5.5	5	7.25	6.5
valge	white	7	6	17	2	10.5	1	7.25	6.5
hall	grey	8	31	5	4	5.5	2	9.25	10
lilla	purple	9	9	2	9	2	9	6.67	5
roosa	pink	10	19	4	7	10.5	12	10.42	11
pruun	brown	11.5	12	9	5	5.5	2	7.50	8
beež	beige	11.5	21	69	71	42.5	42.5	42.92	15
hele-sinine	light-blue	13	7	10	11	42.5	42.5	21.00	13
tume-sinine	dark-blue	14.5	14	11	14	10.5	10	12.33	12
tume-punane	dark-red	14.5	40	48	38	42.5	42.5	37.58	14

Table 8

Hierarchical order of the main candidates for the status of the basic colour term. MR – mean rank, R – rank of the means, S – salience index for the whole results in the list task (total), R – rank of the salience, B–K – Berlin and Kay's rank order, Σ' – sum 1 (total), and Σ'' – sum 2 (until the first stop).

Term	Gloss	MR	R	S	R	B-K	Σ'	Σ''
roheline	green	3.58	1	0.634	4	4.5	5	5
sinine	blue	4.26	2	0.756	1	6	4	4
must	black	4.33	3	0.568	5	1.5	5	5
punane	red	6.58	4	0.716	2	3	5	5
lilla	purple	6.67	5	0.409	8	9.5	3	3
valge	white	7.25	6.5	0.515	6	1.5	4	4
oranž	orange	7.25	6.5	0.433	7	9.5	4	4
pruun	brown	7.50	8	0.334	9	7	4	3
kollane	yellow	7.92	9	0.637	3	4.5	4	4
hall	grey	9.25	10	0.229	12	9.5	4	3
roosa	pink	10.42	11	0.284	10	9.5	3	2
tume-sinine	dark-blue	12.33	12	0.139	14	42	1	1
hele-sinine	light-blue	21.00	13	0.217	13	42	1	1
beež	beige	49.92	14	0.271	11	42	1	0
hele-kollane	light-yellow	–	15	0.056	20	42	0	1

The salience index that takes into account only the results of the list task also works well but it does not discriminate basic terms from non-basic ones so clearly. The non-basic term for beige takes the position 11, whereas the basic term grey takes the position 12.

Ordering the established basic terms according to the mean rank which takes into account both the results of the list and tile naming tasks and according to the list task salience index gives different results. The most salient colour term is *roheline* 'green', if all measures are taken into account, and *sinine* 'blue', if the salience index is looked at in Estonian. Most subjects offered first the term for blue (Table 9) in this study. The terms named first are most simple (C.I. = 1.05). The subjects named 15 different colour names first (C.I. = 1.27 for these different names).

The ranks of the means and of the salience index, as well as the first named colour term in the list task, do not correspond to the Berlin and Kay hierarchy. According to this hierarchy the terms for white and black, after them for red, etc. must be the most salient.

Now the candidates for basic status that have not acquired this status will be studied. There are 4 such colour terms: *tume-sinine* 'dark-blue', *hele-sinine* 'light-blue', *hele-kollane* 'light-yellow', and *beež* 'beige'.

Table 9

The first offered terms in the list task.

Term	Gloss	Women (53)	Men (27)	Total (80)
sinine	blue	11	7	18
punane	red	10	7	17
must	black	8	5	13
valge	white	8	3	11
roheline	green	6	2	8
kollane	yellow	3	0	3
lilla	purple	1	1	2
bordoo-punane	claret-red	1	0	1
hele-kollane	light-yellow	1	0	1
oranž	orange	1	0	1
rooste-punane	rusty red = rubiginous	1	0	1
sambla-roheline	moss-green	1	0	1
umbrea	umber	1	0	1
ultramariin	ultramarine	0	1	1
violett	violet, purple	0	1	1

The first characteristic (i) of Berlin and Kay's original definition of the basic colour term says that the term is monolexemic; that is, its meaning is not predictable from the meaning of its parts. (Berlin & Kay 1969: 6) Although the terms for dark-blue, light-blue, and light-yellow were psychologically salient and they all cleared a threshold for basicness they are not basic. They are not monolexemic while their meaning is predictable from their parts. The modificator *hele* 'light' shows that the colour in question is somewhat lighter than the colour of the main term. So *tume-sinine* 'dark-blue' is a blue that is darker than a normal blue and *hele-sinine* 'light-blue' is a blue that is lighter than a normal blue.

According to the original definition of basicness a colour term is basic if there is stability of its reference across informants (iv2). (BCT: 6) If only the list task is considered, then the term beige has some basic traits but if the results of the naming task are looked at then there is nothing basic in its behaviour. There was no consensus what the beige actually is. The term *beež* 'beige' was not used dominantly for any tile. For instance, there was no consensus what the colour of the tile ORO S3 actually is; 42 different terms (C.I. = 2.02) were used for this tile. Most terms were modified compounds. The term *beež* 'beige' was used only 6 times for that tile. It follows that the term beige must be eliminated not only for its questionable psychological salience but also because beige does not agree with the original definition for basicness.

4. Discussion

Using the modified field method of Davies and Corbett, it was shown that there are 11 basic colour terms in Estonian: *valge* 'white', *must* 'black', *punane* 'red', *kollane* 'yellow', *roheline* 'green', *sinine* 'blue', *pruun* 'brown', *hall* 'grey', *lilla* 'purple', *oranž* 'orange', and *roosa* 'pink'.

At the beginning of the 1980s there was a fruitful round-table discussion on colour terms in Estonia. In this discussion, different positions were presented. As a reaction to this round-table some Estonian scientists introduced the universalistic colour theory of Berlin and Kay (BCT) into discussion. (Parmasto 1982, Allik 1982) The primary reception of this theory was quite naive. For example, Parmasto, who was a serious defender of the universalistic hypotheses, translated the Stage VII term purple as *purpurne* into Estonian. (1982: 375) He used homonymous Estonian colour name *purpur* and added the productive adjective ending *-ne*. The real equivalent of the English term purple is *lilla*. Allik, another defender of the universalist positions made the same mistake translating purple homonymously *purpurne* (1982: 381).[1]

The Finnish linguist Koski proposed that there are 10 basic colour terms in Estonian (1983). He excluded the term *oranž* 'orange' from his list of basic terms. Unfortunately his monograph on Finnic colour terms is based on his work with dictionaries and dialect catalogues rather than on the empirical field-work.

The only Finno-Ugric language described by Berlin and Kay was Hungarian which they falsely classified as an Altaic language. (BCT: 95) Berlin and Kay also made some other mistakes describing Hungarian colour terms. (cf. Grossmann 1988: 14–15) They proposed that the basic term for white is *fejér* which is a quite obsolete parallel form for the correct *fehér* 'white'. The name orange in Hungarian is *narancssárga* 'orange-yellow' (< *narancs* 'subst. orange' + *sárga* 'yellow'). According to the original criteria for basicness that (i) the basic colour term is monolexemic and (vi) colour terms that are also the name of an object characteristically having that colour are suspect (BCT: 6), this term is not basic in Hungarian. The same applies for pink *rózsaszín* 'rose-colour' (*rózsa* 'subst. rose' + *szín* 'colour'). It is doubtful that there are basic terms for pink and orange in Hungarian. It is possible that those terms are basic psychologically but not linguistically. Berlin and Kay proposed that Hungarian may possess 12 basic colour terms having an extra term for red region. But the basic status of the second term for red *vörös* is not clear. A recent study rejects the possibility that there are two basic terms for red in Hungarian. According to MacLaury et al. (1997) only *piros* 'red' is basic and *vörös* 'red' is secondary.

There is also a minor empirical study of another Ugric language Mansi (Vogul) colour terms. (Sipőcz 1994) This paper is mainly based on literature; but 50 colour circles were shown to 3 female native speakers and asked to name the colour. There was very little consensus among the three Mansi speakers on how to name those colour circles. (Sipőcz 1994: 90–99)

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[1] In the revised version of his paper, Allik uses the correct equivalent *lilla* instead of *purpurne* for purple (1997: 106).

So the present study of the Estonian colour vocabulary is the first empirical study of a Finno-Ugric language with a sufficient number of subjects (80) and precise colour stimuli.[2]

When all 759 different colour terms collected in the list and tile naming tasks are investigated, it becomes clear that there are many modified compounds (C.I. = 2.10) in Estonian. (cf. Rannut 1966, Õim 1983) In Russian, for example, no particular modified term was offered by more than 3 people from 77 in the list task. (Davies & Corbett 1994a: 72) In the same study of the Russian colour terms, the subjects named more compounds in the tile naming task than in the list task. Although there were some dominant modified compounds, these compounds were not dominant at the 50 % consensus level. (D.I. 1/2) Õim wrote that it is possible to express any hue, shadow, tint, intensity or darkness/lightness with one compound in Estonian whereas it is not always possible in Russian. (1983: 27)

The other interesting trait of the Estonian colour vocabulary is the instability of the concept blue. Although the term *sinine* 'blue' is one of the psychologically most salient basic terms in Estonian, the modified *hele-sinine* 'light-blue' and *tume-sinine* 'dark-blue' have also some basic traits clearing both one threshold for basicness. The term for light-blue cleared a hurdle according to the frequency measure and the term for dark-blue was dominant for the tile BV (blue-violet) at the 50 % consensus level. (D.I. 1/2)

Berlin and Kay showed that there are two basic colour terms for the blue region in Russian. (1969: 98–99) This result is also supported by Corbett and Morgan (1988) and Davies and Corbett. (1994a) After World War II there was extensive Russian pressure on Estonian culture and language. It is quite possible that the two Russian basic terms for blue *goluboj* 'light-cold-blue' and *sinij* 'blue' influenced the Estonian concept of blue so that it divided not into two but into three separate sub-categories. Since the Russian *sinij* is homonymous for the Estonian term *sinine* 'blue', it helped to destabilise the concept of blue in Estonian.[3] The differences between the use of the Estonian and Russian terms for blue are described in a paper of Liiv. (1982)

The Estonian colour term *beež* 'beige' was salient in the list task but not in the tile naming task. It is interesting to mention that *beige* 'beige' is a candidate for basic status in French. (Lauriers 1992)

If one considers Estonian and its neighbouring languages in the Baltic Sea area, only Estonian and Russian have a fully developed Stage VII colour system. (Table 10) Finnish is characterised by the lack of a basic term for pink. The status of the terms *violetti* 'purple' and *oranssi* 'orange' is questionable. It is highly likely that the terms for purple, pink, and orange are not used by all Livs and so they are non-basic in Liv. In Baltic languages the Stage VII terms for purple may

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[2] Šemjakin has collected colour names from Nenets (Northern Samoyedic) showing to some native speakers the Ostwald's colour tables. Unfortunately the method is not described in Šemjakin (1960).

[3] Etymologically Estonian *sinine* 'blue' and Russian *sinij* 'blue' are not connected.

be basic (Lithuanian *violetinis* and Latvian *violets*) but the status of the terms for pink and orange is most problematic. The status of the Lithuanian term *žydras* 'light-blue' is also not clear.

Table 10

Basic colour terms in Finnic and Baltic languages and in Russian. Finnish data are from Koski (1983: 265), Russian from (Davies & Corbett 1994a); Estonian data and the preliminary data for other languages are collected by the author of this paper. The basic status of the terms printed in *italics* is not clear.

Gloss	Livonian	South-Estonian	Estonian	Finnish	Latvian	Lithuanian	Russian
black	mustā	must	must	musta	melns	juodas	černyj
white	vālda	valgõ	valge	valkoinen	balts	baltas	belyj
red	punni	verev	punane	punainen	sarkans	raudonas	krasnyj
blue	siņņi	sinine	sinine	sininen	zils	mėlynas	sinij
light-blue	—	—	—	—	—	*žydras*	goluboj
yellow	vīri	kõllanõ	kollane	keltainen	dzeltens	geltonas	želtyj
green	mǭltsi	roheline	roheline	vihreä	zaļš	žalias	zelёnyj
brown	brūni	pruun	pruun	ruskea	brūns	rudas	koričnevyj
grey	ōgi	hall	hall	harmaa	pelēks	pilkas	seryj
purple	*lillā*	lilla	lilla	*violetti*	violets	violetinis	fioletovyj
pink	*rōza*	roosa	roosa	—	*rožains*	*rožinis*	rozovyj
orange	*oranž*	*orants*	oranž	*oranssi*	*oranžs*	*oranžinis*	oranževyj

5. Summary

The present study on the Estonian colour vocabulary is the first empirical study of a Finno-Ugric language with a sufficient number of subjects (80) and precise colour stimuli. Using the modified field method of Davies and Corbett (list and colour naming tasks), a corpus of the Estonian colour terms was established. It contains 6,712 colour terms (C.I.= 1.55), among them 759 different colour names (C.I. = 2.10).

There are exactly 11 basic colour terms in Estonian: *valge* 'white', *must* 'black', *punane* 'red', *kollane* 'yellow', *roheline* 'green', *sinine* 'blue', *pruun* 'brown', *hall* 'grey', *roosa* 'pink', *lilla* 'purple', and *oranž* 'orange'. This corresponds to the fully developed Berlin and Kay's Stage VII colour system. One can conclude that Estonian encodes the basic colour terms in the universal way predicted by Berlin and Kay.

Most secondary colour terms in Estonian are modified terms or compounds.

Although the term *sinine* 'blue' is one of the psychologically most salient basic terms in Estonian, the modified *hele-sinine* 'light-blue' and *tume-sinine* 'dark-blue' are also quite salient. It may be explained with the Russian influence.

It must be concluded that methodically it is not sufficient to collect only psychologically more salient data which the subjects name in one breath (before their first pause) in the list task. Only the whole list of terms suffices for establishing basic terms. An original cognitive salience index that combines the list task parameters (frequency and mean position of a term) and a complexity index that takes into account the parts of compounds and colour modifiers were introduced in this paper.

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