

DISTRIBUTION OF COLOUR TERMS IN OSTWALD'S COLOUR SPACE IN ESTONIAN, FINNISH, HUNGARIAN, RUSSIAN AND ENGLISH

Mari Uusküla

Institute of the Estonian Language, Tallinn, and the University of Tartu

Abstract. This article presents the distribution of colour terms in Ostwald's colour space over five languages: Estonian, Finnish, Hungarian, Russian and English. All these languages have been argued to be stage VII languages in the terminology of Brent Berlin and Paul Kay, and thus to have 11 basic colour terms (except Russian, which probably has 12 basic colour terms). The data for all the languages represented in the present study is collected by using the field method presented by Ian Davies and Greville Corbett and is thus comparable. Sixty-five coloured tiles based on Ostwald's colour system are used as stimuli. Several colour terms in one language are found to be equivalent to colour terms in other languages, while in other cases one term in one language does not correspond to terms used in other languages. In addition, the best examples of colour or so-called focal points vary. As a result, it is claimed that the distribution of colour terms is not equal in related and non-related languages (there are either large or slight differences between colour naming depending on the concrete colour sample). It is therefore concluded that colour naming is a language- or even culture-specific quality.

Keywords: basic colour term, fieldwork, focal point, colour naming, Ostwald colour system, comparative linguistics

1. Introduction

Colour terms have been extensively studied in many languages since Brent Berlin and Paul Kay published their seminal work "Basic color terms. Their universality and evolution" (1969). In this study they tried to identify the basic colour terms in ninety-eight languages, from which the data for twenty languages from a number of unrelated families was collected by empirical tests with native-speaking subjects. Their hypothesis was that all languages have maximally 11 basic colour term inventories and the colour term inventory of all languages evolved, or will evolve, according to a certain hierarchical order.

The criteria for a term to be basic were also set out by Berlin and Kay. The original Berlin and Kay field method (which they used for data collection in twenty languages) for establishing basic colour terms consisted of eliciting candidates for basic colour terms from their subjects, then mapping the referents of these on a Munsell colour chart consisting of 329 colour chips, and, finally, asking their informants to mark both the focal point (i.e. the best example of a colour term) and the outer boundary of a colour term (1969:5). A few years later Eleanor Rosch Heider conducted several experiments for identifying the focal points of different languages in the Munsell array (1971, 1972). The Berlin and Kay procedure has been adapted by Robert MacLaury (1997), who asked his subjects to place a grain of rice on each exemplar of a colour term in the same Munsell chart as used by Berlin and Kay, in order to map the domain of reference of each term. The imperfection of the method is that it takes a considerable amount of time with each subject. Davies and Corbett have critically pointed out that this method is also relatively cumbersome to establish the degree of consensus across speakers (1995). They instead propose a new field method based on Berlin and Kay's original procedure, consisting of a colour term elicitation task to elicit the basic term candidates, which is followed by a mapping procedure on a restricted set of just 65 colour tiles (Davies et al. 1992, Davies and Corbett 1994, 1995). The 65-set stimuli is a subset of the Color Aid set, based on the colour system of Wilhelm Ostwald and not that of Munsell. The criteria for picking these particular 65 colour samples, the Color Aid designation, as well as the CIE coordinates of the stimuli, can be found in Davies et al. (1992).

The field method of Davies and Corbett is described in this article more exactly henceforward. The only deficiency of this field method is that it uses pre-determined colour stimuli which may not correspond to focal points (or best examples) in certain languages. The whole procedure of this method lasts about 15 to 20 minutes, thus allowing relatively large numbers of informants to be tested. Languages which colour terms have been tested with this method are comparable.

In this article, five languages – Estonian, Finnish, Hungarian, Russian and English – are taken into consideration. For all these the data is collected by using the field method of Davies and Corbett. The originality of this article lies in the comparison of the data of the colour naming task, where the subjects are shown 65 colour samples and asked how they would name each colour in their native language. For Estonian, the data used is that of Urmas Sutrop (1995, 2000, 2002), for Russian and English it is taken from the articles by Davies and Corbett (1994, 1995). For Hungarian and Finnish, the data has been collected by the author and has been partly presented beforehand (Bogatkin-Uusküla and Sutrop 2005a, b).

This study thus aims to find the answers to the following questions: 1) How are the colour names distributed in Ostwald's colour space, and which colour samples (or tiles) correspond to the best examples (or focal points) of each basic colour term in all five languages? 2) What are the similarities and differences of the names of the colour samples between languages?

2. Case study

Languages: Estonian, Finnish (both Finnic), and Hungarian (Ugric), all Uralic; Russian (East Slavic, Slavic) and English (West Germanic, Germanic), both Indo-European.

Regions where data have been collected with the years of data collection (per language): Estonian – Tallinn and Tartu, Estonia, 1995 (Sutrop 1995, 2000, 2002); Finnish – Helsinki, Turku, Lempäälä (near Tampere), Finland, 2005; Hungarian – Budapest, Debrecen, Győr, Pécs, Dejtár, Ipolyvece, Balassagyarmat and Budaörs, Hungary, 2002–2003 (Bogatkin-Uusküla and Sutrop 2005a, b); Russian – Moscow, Russia 1994 (Davies and Corbett); English – place not noted, 1995 (Davies and Corbett).

Subjects: The number of subjects differs for every language.

For Estonian, there were 80 subjects in total: 53 women and 27 men, whose ages ranged from 9 to 72 years with a mean of 29 years. Subjects were all native speakers of Estonian, with different dialectic backgrounds. Two of the subjects were Estonian-Russian bilinguals (Sutrop 1995, 2000, 2002).

For Finnish, there were 29 subjects in total, 19 women and 10 men, whose age ranged from 11 to 75 years with a mean of 43 years. Subjects were all native speakers of Finnish, having different dialectic backgrounds.¹

For Hungarian, there were 125 subjects in total, 66 women and 59 men, whose ages ranged from 9 to 82 years with a mean of 36 years. The subjects were all native speakers of Hungarian, with different dialectic background: one was a Hungarian-Finnish bilingual (Bogatkin-Uusküla and Sutrop 2005a, b).

For Russian, there were 77 subjects in total, 24 men and 53 women, whose ages ranged from 18 to 65 years with a mean of 34 years. Subjects were all native speakers of Russian. All the subjects did the list task, but only 54 did the colour naming task, whose data is used in the present study (Davies and Corbett 1994).

For English, there were 47 subjects in total, 23 women and 24 men, whose ages ranged from 21 to 65 years with a mean of 29 years. Subjects were all native speakers of English (Davies and Corbett 1995).

The interviewers spoke with the subjects in their native language. All the subjects did the colour-name list task first and then the colour naming task. In the present study, only the data of the colour naming task is used. The data used in this study is summarised in Table 1.

Colour vision: All the subjects had normal colour-seeing ability. This was tested in every case by using *The City University Color Vision Test* (Fletcher 1980). For this the subject is shown ten black tiles, in the middle of which is a dot of a particular tone of colour surrounded by four dots of colour of a different tone. The interviewee must say which dot is the most similar to the central one: above, down, right or left. The test makes it possible to diagnose almost all the anomalies of colour vision like deuteranopia, protanopia, tritanopia, etc.

¹ Finnish data collection conducted by the author of the article is still in progress.

Table 1. Data used in present study

Language family	Language group	Language	Number of subjects	Source
Finno-Ugric (Uralic)	Finnic	Estonian	80	Sutrop (1995, 2000, 2002)
		Finnish	29	Uusküla (unpublished)
	Ugric	Hungarian	125	Bogatkin-Uusküla and Sutrop (2005a,b)
Indo-European	East Slavic, Slavic	Russian	54	Davies and Corbett (1994)
	West Germanic, Germanic	English	47	Davies and Corbett (1995)

3. Field method for data collecting

In this work, the data for each language was collected by using the field method of Ian Davies and Greville Corbett (Davies et al. 1992, Davies and Corbett 1994, 1995). This field method consists of two parts: the colour-name list task and the colour naming task. The results collected in different languages with this method can be compared. In this study, only the data for the colour naming task is used.

Stimuli. The stimuli for the colour naming task were 65 coloured tiles. Each tile was 5 cm square and 0.4 cm thick and consisted of a rigid wooden base covered with coloured papers selected from the Color Aid Corporation range of colours, which uses the modified version of Ostwald's colour system. The rationale for the 65 colour sample selection can be found in Davies et al. (1992).

The Ostwald's colour system. In Ostwald's colour system, the main features of colour are colour tone i.e. *hue*, content of white i.e. *tint* (T) and content of black or blackness i.e. *shade* (S). The brightness grades of grey scale are also distributed into eight grades that are subject to tint and black content. Color Aid Corporation uses the modification of Ostwald's colour system, where there are 24 chromatic colours – 6 basic colours: Y – yellow, O – orange, R – red, V – violet, B – blue, G – green and their transition tones e.g. YO – yellow-orange, YOY – yellow-orange-yellow. Every colour tone breaks down into four light variants T1-T4, in which the share of tint increases pro rata, and into three dark variants S1-S3, where the role of black increases. Besides this, some extra-system colours have been used, i.e. Sienna and Rose Red.

Procedure. All subjects did the list task first, but as mentioned above, this focuses only on the results from the data of colour naming task. In the colour naming task, subjects were shown 65 colour squares or tiles, one square at a time in random sequence and asked to name the tile. The order was different for each subject and the colours were shown indoors in sufficient daylight (avoiding deep shade or direct sunlight) on a grey base. The subjects were allowed to say if they did not know a suitable term. All the answers given were recorded or written down. After this, the experimenter removed the tile and then displayed the next tile, and so on until all 65 tiles had been displayed. The tile naming task lasted for 15 to 20 (sometimes 30) minutes depending on the language and subject.

Data processing. First, the distribution of the most frequent colour terms and their corresponding frequencies in the colour naming task is cited (Estonian, Russian, and English) or counted (Finnish and Hungarian) for each language separately. After this, they are analysed and the results are laid out in a table which consists of the Color Aid Corporation code of sample, the colour term offered by the subjects in the five languages for this concrete sample, and the naming frequency.

4. Distribution of colour terms

In this section, two questions are answered. Firstly, it is shown which of the colour tiles corresponds best to the respective basic colour terms (red, green, yellow, blue, brown, orange, purple, pink, grey; white and black are shown in Table 2 only and are not discussed widely, because there was only one colour tile in the colour naming task that subjects could possibly name as ‘white’ and two colour tiles that could be named ‘black’, of which one tile has a Color Aid code GRAY 8) in every language and how they are distributed in Ostwald’s colour space. Secondly, names given for selected colour tiles are analyzed with respect to two features: whether there is agreement across subjects in one language, and the comparison of named colour terms across languages for particular colour tiles.

4.1. Prototypical basic colour terms in colour space

My assumption is that the best or prototypical examples of concrete colour vary according to language. Even in very closely related languages like Estonian and Finnish, the prototypes of some colour which are indicated with almost the same word, like *punane* and *punainen* (both meaning ‘red’ in English), do not match with each other, because, according to the data collected, the best example of red in Estonian is the colour tile with the Color Aid code ROR, while for Finnish it is the colour tile with the code RO.

The distribution of prototypical examples of basic colour terms in all languages over Ostwald’s colour space is described in Table 2. For Estonian, the basic colour terms listed in the table – *must* ‘black’, *valge* ‘white’, *punane* ‘red’, *roheline* ‘green’, *kollane* ‘yellow’, *sinine* ‘blue’, *pruun* ‘brown’, *lilla* ‘purple’, *roosa* ‘pink’, *oranž* ‘orange’, and *hall* ‘grey’ – are taken from studies by Urmas Sutrop (1995, 2000, 2002).

For Finnish, I collected the data in Finland. From this data it can be preliminarily concluded that the basic colour terms in Finnish are *musta* ‘black’, *valkoinen* ‘white’, *punainen* ‘red’, *vihreä* ‘green’, *keltainen* ‘yellow’, *sininen* ‘blue’, *ruskea* ‘brown’, *violetti* ‘purple’, *oranssi* ‘orange’, *vaaleanpunainen* ‘pink, literally light red’, and *harmaa* ‘grey’. At this point it should also be noted that the number of subjects is lower for Finnish than for other subjects and therefore the results are less conclusive.

In his monograph “Värien nimitykset suomessa ja lähisukukielissä”, Mauno Koski has argued that there might be only 10 basic colour terms in Finnish, because

of the lack of a basic term for pink (1983). According to Koski, the status of the terms *violetti* 'purple' and *oranssi* 'orange' is questionable as well. Koski has also argued that Estonian might not have a wholly developed 11 basic colour term system, and he has excluded the colour term *oranž*, 'orange', from his list of basic colour terms of Estonian. His monograph on Finnic (including Finnish, Estonian, South-Estonian, Livonian, etc.) colour terms is based on his work with dictionaries and dialect catalogues (Koski 1983). Urmas Sutrop has instead proved with empirical field work that *oranž* is indeed a basic colour term of modern Estonian (Sutrop 1995, 2000, 2002). In this article, Finnish has been treated as a language with 11 basic colour terms, including *violetti* 'purple', *oranssi* 'orange', likewise *vaaleanpunainen* 'pink; literally light red' (Hungarian also has two morphologically complex basic colour terms – *narancssárga* and *rózsaszín*, see below).

I and my colleague have already suggested earlier that Hungarian has 11 basic colour terms (Bogatkin-Uusküla and Sutrop 2005a, b) and is hence not an exception with 12 basic colour terms including two reds *piros* and *vörös* (usually cited as light red and dark red respectively), as has been stated in numerous earlier studies and textbooks starting from the classic study by Berlin and Kay (1969:21, 35–36, 95) and some later studies e.g. Crystal (1987:106), Wierzbicka (1990, 1996) etc. Berlin and Kay also made some other mistakes, proposing that the basic colour term for white is *fejér* (which is not a basic colour term of modern Hungarian, it might only be used in some dialects, if at all) instead of *fehér*, and the basic colour term for orange is *narancssárga* 'orange yellow' instead of *narancs* 'orange'. The former, and not the latter, is certainly a basic colour term of modern Hungarian. Basic colour terms of Hungarian used in a table below are *fekete* 'black', *fehér* 'white', *piros* 'red', *zöld* 'green', *sárga* 'yellow', *kék* 'blue', *barna* 'brown', *lila* 'purple', *narancssárga* 'orange', *rózsaszín* 'pink; literally rose colour(ed)', and *szürke* 'grey'.

Russian has also been argued to have exceptionally 12 basic colour terms, including two terms to denote blue *sinij* '(dark) blue' and *goluboj* 'light blue' (Berlin and Kay 1969:35–36). Many studies have confirmed this claim (Andrews 1994, Corbett and Morgan 1987, Davies and Corbett 1994, etc.), and only recently has it been argued that *goluboj*, given that this is a symbolically charged term, emerged in Russian as a culturally basic colour term (Paramei 2005). There has also been second debate concerning Russian colour terms, suggesting that Russian constitutes an exception to Berlin and Kay's developmental theory, and that it has two basic terms for blue but none for purple. For the moment there is agreement that the basic colour term for purple in Russian is *fioletovyj* (Davies and Corbett 1994, Moss 1989). Basic colour terms viewed in the table for Russian are the following: *černyj* 'black', *belyj* 'white', *krasnyj* 'red', *zelenyj* 'green', *želtyj* 'yellow', *sinij* 'blue', *goluboj* 'light blue', *koričnevij* 'brown', *fioletovyj* 'purple', *rozovij* 'pink', *oranževyj* 'orange', and *seryj* 'grey' (Davies and Corbett 1994:86).

Berlin and Kay established that the inventory of English basic colour terms numbers 11: *black, white, red, green, yellow, blue, brown, purple, pink, orange,* and *grey* (1969). This has also been verified by field method of Davies and Corbett and is considered to hold (Davies and Corbett 1995).

Table 2 shows the best examples of focal colour areas in Estonian, Finnish, Hungarian, Russian and English. The term focal point or focal colour area used here is adopted from the earlier studies by Berlin and Kay (1969) and Eleanor Rosch Heider (1971, 1972). Briefly, focal colours are those areas of the colour space that are most exemplary of basic colour names in every language. Related to this definition, the table below contains 11 (12 for Russian) basic colour terms which have been distributed in colour space according to their naming frequency, so that the colour name is placed under the Color Aid code where its naming frequency has been the highest. The colour term is listed under more than one Color Aid code for the cases where it has been named equally highly (for instance, Russian colour term *želtyj* ‘yellow’ has been named evenly to denote the yellow colour of Color Aid code Y and code YOY). It obviously follows that focal points in languages are surrounded by a focal colour area. In field method of Davies and Corbett only two yellow colour tiles are used in the colour naming task, and therefore the focal point (for all languages, not only Russian) may lie somewhere in between these two tiles. This combines exactly with the notion by Berlin and Kay that focal points form clusters and are rather fuzzy areas (1969). The relative naming frequency is also given for every colour term.

Following to Table 2, some conclusions can be made about the best examples (or prototypes) of 9 colour terms (corresponding to English yellow, orange, red, pink, purple, blue, green, brown and grey) in every language. Generally speaking, the most prototypical colours are divided between two different Color Aid colour codes (i.e. yellow, orange, red, brown, green, pink and grey). However the focal point of purple for these languages lies in three different colour samples, and for blue there are even four different colour samples (if we assume that Russian has two basic colour terms for blue, and therefore two different focal points for *sinij* ‘blue’ and *goluboj* ‘light blue’).

Let us now move on to analyse prototypical colour examples. Prototypical yellow in the languages under consideration has been divided, for instance, between two colour samples. Yellow in Estonian, Finnish, Hungarian and English corresponds to colour code Y. Russian subjects gave colour name *želtyj* equally with tile Y to another colour tile YOY, so prototypical yellow for Russian probably has wider margins than in other languages. For instance, in Estonian, prototypical yellow can only be Y – the bright and saturated colour of sun, and by no means YOY, which the subjects of Estonian have indicated with the colour term *kollane*, but also with another colour term *oranž* ‘orange’ (Sutrop 1995, 2000, 2002).

Prototypical orange lies for most languages in colour tile YO with the only exception being English, whose subjects considered colour tile O as a better example of a colour term *orange*. It is a darker shade of orange colour than YO.

Looking at the colour tiles YO S3 and O S3, which means that the colour tones YO and O are broken down into dark variants (here the role of black is the highest), we can say that these are the most prototypical examples of brown. For Finnish and Hungarian, the focal point of brown lies in colour tile YO S3, while for Estonian, Russian and English it is colour tile O S3, which is much darker than

the previous one and explains why Hungarian subjects have put it with the other colour term *sötétbarna* 'dark brown'. For Estonian, Russian and English subjects, the colour tile YO S3 is not brown at all, and they have used other colour terms to indicate this tile, respectively *roheline* 'green', *bolotnyj* 'marsh green' or *xaki* 'khaki' and *khaki* (Sutrop 2002, Davies and Corbett 1994, 1995). One should here bear in mind that all the colour tiles were shown to the subjects on a grey base, which changes the colours perceptually.

Only two colour tiles were held prototypical reds by the subjects of the selected languages – RO and ROR (both of these colours contain orange). While the colour tile R was not held to be a prototype of red in any of the five languages. Indeed, it is very often named by another colour term like *dark red*, *crimson*, *raspberry*, *burgundy red*, etc. RO thus seems to be a focal point of red for Finnish, Hungarian and Russian speakers; ROR for Estonian and English speakers.

Colour tiles with Color Aid codes ROR T3 and R T4, where white has been added to the colours ROR and R, are the two quite different samples of pink, being at the same time the best examples of this colour in languages under consideration. For Estonian and Russian subjects, the focal point of pink lies in colour tile ROR T3, whereas for Finnish, Hungarian and English subjects, the prototypical pink is R T4, which is much lighter than the previous. A possible explanation for this is that Hungarian and Finnish use colour names with which these two languages indicate a pink colour. Finnish uses the colour word *vaaleanpunainen*, which literally means light red; Hungarian indicates it with the colour term *rózsaszín* which meaning is 'colour of rose', 'rose colour' and which probably refers to the colour of the briar rose (*Rosa centifolia*). This is also why so many scholars have not included it in the list of Hungarian basic colour terms, because Berlin and Kay claim in their monograph that compounds containing the word *-colour* or *-coloured* should be treated as doubtful (Berlin and Kay 1969, Kicsi 1988, 1991, Kiefer 2005). We have argued earlier that according to extensive field work in Hungary, *rózsaszín* is, indeed, a basic colour term in present-day Hungarian (Bogatkin-Uusküla and Sutrop 2005a:569).

Prototypical purple is divided between three different colour tiles – RV, VRV and V, from which the tile RV is a focal point of purple in Estonian, VRV in Finnish and Hungarian, and V in Russian. English subjects indicated tiles RV and V equally highly as the colour name *purple*. From these purple colour samples RV is the lightest and V is the darkest. The latter might be the best example of purple in Russian, because for lighter purples many other (non-basic) colour terms are used, like *lilovyj* 'lilac', *sirenevyj* 'lilac', *bargovyj* 'crimson', *purpurnyj* 'purple', and *purpurovyj* 'purple' (Moss 1989). There is no good explanation for why the focal points should lie exactly in these tiles for other languages. One reason might be that all the Finno-Ugric languages adopt adjectives *light* and *dark* to colour terms relatively easily, and when one sees the purple which is darker than the prototypical purple, s/he might indicate to it with the compound, for example Estonian *helelilla* 'light purple' and *tumelilla* 'dark purple'. The real purple that is referable to as *lilla* 'purple' thus remains somewhere between these two extremes, and the colour tile RV is indicated with this colour term (see Sutrop 2002 at this point).

Table 2. Distribution of colour terms Languages are abbreviated as follows: **En.** – English, **Est.** – Estonian, **Fi.** – Finnish, **Hu.** – Hungarian, and **Ru.** – Russian.

Color Aid code Hue	Colour name	Relative frequency	Color Aid code Tint or shadow	Colour name	Relative frequency	
Y	Est. <i>kollane</i>	0.650				
	Fi. <i>keltainen</i>	0.793				
	Hu. <i>sárga</i>	0.224 ²				
	Ru. <i>želtyj</i>	0.592				
	En. <i>yellow</i>	0.893				
YOY	Ru. <i>želtyj</i>	0.592				
YO			S3	Fi. <i>ruskea</i> Hu. <i>barna</i>	0.482 0.528	
OYO	Est. <i>oranž</i>	0.700				
	Fi. <i>oranssi</i>	0.724				
	Hu. <i>narancssárga</i>	0.712				
	Ru. <i>oranževyj</i>	0.833				
O	En. <i>orange</i>	0.829	S3	Est. <i>pruun</i> Ru. <i>koričnevij</i> En. <i>brown</i>	0.737 0.962 0.914	
RO	Fi. <i>punainen</i>	0.724				
	Hu. <i>piros</i>	0.632				
	Ru. <i>krasnyj</i>	0.685				
ROR	Est. <i>punane</i>	0.575	T3	Est. <i>roosa</i>	0.575	
	En. <i>red</i>	0.787		Ru. <i>rozovyj</i>	0.703	
R			T4	Fi. <i>vaaleanpunainen</i> Hu. <i>rózsaszín</i> En. <i>pink</i>	0.482 0.424 0.787	
	RV	Est. <i>lilla</i> En. <i>purple</i>	0.537 0.787			
	VRV	Fi. <i>violetti</i>	0.448			
		Hu. <i>lila</i>	0.576			
V	Ru. <i>fioletovyj</i>	0.777				
	En. <i>purple</i>	0.787				
B	Est. <i>sinine</i>	0.637	T1	En. <i>blue</i>	0.914	
	Fi. <i>sininen</i>	0.551				
BGB	Est. <i>sinine</i>	0.637	T3	Ru. <i>goluboj</i>	0.722	
	Hu. <i>kék</i>	0.512				
	Ru. <i>sinij</i>	0.703				
G	Est. <i>roheline</i>	0.750				
	Fi. <i>vihreä</i>	0.655				
	Hu. <i>zöld</i>	0.600				
	Ru. <i>zelenyj</i>	0.925				
YG	En. <i>green</i>	0.936				

² The focal point of Hungarian colour term *sárga* has been placed in colour tile Y, because its naming frequency has been the highest for this particular colour tile. Still, not the colour name *sárga*, but the colour name *citromsárga* 'lemon yellow', is the most frequently named term for this tile. Therefore we also claim that the basic status of colour term *sárga* is somehow doubtful.

Color Aid code Hue	Colour name	Relative frequency	Color Aid code Tint or shadow	Colour name	Relative frequency
GRAY 2	Est. <i>hall</i>	0.712			
	Ru. <i>seryj</i>	0.888			
GRAY 4	Fi. <i>harmaa</i>	0.620			
	Hu. <i>szürke</i>	0.720			
WHITE	En. <i>grey</i>	0.978			
	Est. <i>valge</i>	0.873			
	Fi. <i>valkoinen</i>	0.586			
	Hu. <i>fehér</i>	0.616			
	Ru. <i>belyj</i>	1.000			
BLACK	En. <i>white</i>	1.000			
	Est. <i>must</i>	0.887			
	Fi. <i>musta</i>	0.862			
	Hu. <i>fekete</i>	0.840			
	Ru. <i>černyj</i>	0.759			
	En. <i>black</i>	0.893			

Prototypical blues are spread over four colour tiles, whereby we should remember that Russian uses two terms for blue. The colour term *goluboj* 'light blue' indicates the colour sample with Color Aid code BGB T3, which is not a prototypical blue in any other language under consideration in this article. The dominant colour terms given to this tile in Estonian, Finnish and Hungarian are *helesinine*, *vaaleansininen* and *világoskék* (all meaning 'light blue'), respectively. Interestingly, the colour word which means blue in these languages comes in the second, third or even fourth position in naming frequency for colour tile BGB T3.

Concerning the other blue tiles, the best example of Finnish is sample B, for English it is B T1, while for Hungarian *kék* and Russian *sinij*, it is BGB. Estonian subjects have given the colour name *sinine* 'blue' equally highly to tiles B and BGB, and thus Estonian has two focal blues, from which one (B respectively) is darker than the other (see more about Estonian blues in Sutrop 2002:197).

Prototypical green in all five languages is more or less the same and the colour name green in Estonian, Finnish, Hungarian and Russian is most frequently given to colour tile G. English subjects named tile YG with the colour term *green* 44 times, colour tile G 43 times. This is not statistically relevant, however.

The only achromatic colour considered more closely in this subsection, is grey, which – surprisingly – has different focal points. Estonian and Russian speakers labelled the colour tile GRAY 2 most frequently with colour name *grey*, while Finnish, Hungarian and English speakers indicated grey as tile GRAY 4. As noted above, the brightness grades of the grey scale are distributed into eight grades, where the content of black increases from 1 to 8, so that the GRAY 1 is the lightest and GRAY 8 is the darkest.

4.2. Do the colour terms correspond to each other between languages?

In this section, I will deal with colour term correspondences in Estonian, Finnish, Hungarian, Russian, and English by viewing the most frequently given names per one single colour tile. It follows that the differences between how one colour is named in one language sometimes do not match how it is named in another language. Besides this, consensus percentage is counted per language to show how the subjects of one language agree or disagree with each other by naming the colour tiles with the same or different names. When the percentage of agreement is 100, it means that every asked subject gave the same colour name to a colour tile. In this case no other colour terms are given. To make the picture clearer, tables are added for every colour tile under consideration.

The first colour tile in the colour space where the colour names do not fully correspond to each other is Y (yellow), because Hungarian subjects have named this tile most frequently not with the colour name *sárga* ‘yellow’ (second frequency), but with the colour name *citromsárga* ‘lemon yellow’. In relation to this, we have earlier claimed that colour term *sárga* has extremely weak basic status and is often replaced by the colour term *citromsárga*, which forms a symmetrical pair with another basic colour term *narancsárga* ‘orange (yellow)’ in modern Hungarian (Bogatkin-Uusküla and Sutrop 2005b). All the other languages use the colour term which most frequently corresponds to English *yellow*. Russian subjects frequently indicated this tile as *limonnyj* ‘lemon (yellow)’, too (37 % of all the answers).

Table 3. Names given to colour tile Y across languages.

Language	Term	Gloss	Percentage
Estonian	<i>kollane</i>	yellow	65%
Finnish	<i>keltainen</i>	yellow	79%
Hungarian	<i>citromsárga</i>	lemon yellow	49%
English	<i>yellow</i>	yellow	89%
Russian	<i>želtyj</i>	yellow	59%

The next problematic colour tile is Y S2, which subjects of Finnish and Hungarian have most frequently named with the colour terms for brown, *ruskea* and *barna*, respectively. English and Estonian subjects, on the contrary, named this tile with colour term *green* and *roheline*, respectively. Russian subjects used a different colour term, *xaki* ‘khaki’, to indicate the colour shown. Interestingly, consensus is quite high among English subjects and very low across all Finno-Ugric language speakers (see table 4).

Moving further in the colour space we find another interesting colour tile ORO, which has been called in turn orange, orange red and red. For Estonian, Russian and Hungarian speakers this tile is red, for English speakers it is orange, and for

Finnish speakers it is orange red. By viewing all the red tiles in field method used here, I conclude that Hungarian speakers mainly use the colour term *piros*. Only a very few speakers use *vörös* in general. Here, the balance is 22/0, i.e. no subject indicated this colour tile with colour term *vörös*. According to the general low naming frequency of *vörös* in the colour naming task (data used here), and for many other reasons suggested above, only *piros* would seem to have a basic colour term status in modern Hungarian (Bogatkin-Uusküla and Sutrop 2005a, b).

Table 4. Names given to colour tile Y S2 across languages.

Language	Term	Gloss	Percentage
Estonian	<i>roheline</i>	green	15%
Finnish	<i>ruskea</i>	brown	21%
Hungarian	<i>barna</i>	brown	20%
English	<i>green</i>	green	62%
Russian	<i>xaki</i>	khaki	43%

Table 5. Names given to colour tile ORO across languages.

Language	Term	Gloss	Percentage
Estonian	<i>punane</i>	red	43%
Finnish	<i>oranssin-punainen</i>	orange red	14%
Hungarian	<i>piros</i>	red	27%
English	<i>orange</i>	orange	43%
Russian	<i>krasnyj</i>	red	26%

The results for the colour tile RVR (red-violet-red), are very interesting, because speakers of different languages referred to this with three different colour terms: (i) Estonian and Hungarian speakers mostly used the normal terms for purple, *lilla* and *lila*, respectively, although the naming frequency was low for both languages; (ii) English subjects indicated through their choices that the best colour term to represent this particular colour is *pink*; (iii) Finnish speakers used the foreign colour word *pinkki* 'pink', which is probably adopted from English, although the naming frequency, and therefore also the consensus across subjects, was extremely low. It seems that Finnish speakers use this colour term particularly for this colour only, because for shades and colours which are lighter and darker subjects very often use another colour term like *liila* 'purple', *sinipunainen* 'purple; literally bluish red' or *violetti* 'purple'. Russian speakers have used different colour term *malinovyj* 'raspberry' for this colour tile, and, surprisingly, the consensus across subjects is the highest comparing to the other languages.

With the next example, I would like to demonstrate the claim made above in this article that the three Finno-Ugric languages in question use modifying adjectives more frequently than Russian and English as the first part of

compounds, but also that the colour names that native speakers of one language gave to some colour tiles do not correspond to how this particular colour is named in other languages. Thus, for example, Estonian subjects have labelled the colour term VBV T4 as corresponding with the colour term *lilla* ‘purple’, Finnish subjects with the colour term *vaaleanliila* ‘light purple’, Hungarians with the colour name *halvány lila* ‘pale purple’, English speakers with the colour term *mauve*, and Russian speakers with colour name *sirenevyj* ‘lilac’.

Table 6. Names given to colour tile RVR across languages.

Language	Term	Gloss	Percentage
Estonian	<i>lilla</i>	purple	25%
Finnish	<i>pinkki</i>	pink	10%
Hungarian	<i>lila</i>	purple	18%
English	<i>pink</i>	pink	21%
Russian	<i>malinovyj</i>	raspberry	44%

Table 7. Names given to colour tile VBV T4 across languages.

Language	Term	Gloss	Percentage
Estonian	<i>lilla</i>	purple	44%
Finnish	<i>vaalean-liila</i>	light purple	14%
Hungarian	<i>halvány-lila</i>	pale purple	26%
English	<i>mauve</i>	mauve	45%
Russian	<i>sirenevyj</i>	lilac	50%

Subsequently, we move to the blue region of colour space and will consider the two colour tiles BV and BGB T3, where the latter represents the prototypical *goluboj* in Russian. Colour tile BV is called by two colour names, which correspond to English *blue* and *dark blue*. Estonian and Hungarian speakers indicated this tile with the colour names *tumesinine* ‘dark blue’ and *sötét kék* ‘dark blue’, respectively, while English and Finnish speakers with *blue* and *sininen*, respectively. Russian speakers used the colour term *sinij*, which means both blue and dark blue in English, and was often reversed to *goluboj* ‘light (or cool) blue’. It has been claimed that both are the colour terms of Russian (Davies and Corbett 1994), and since Russian is a very closely spoken language, it has also influenced Estonian, so that in the latter the blue region is divided between three colour words, *helesinine* ‘light blue’, *sinine* ‘blue’ and *tumesinine* ‘dark blue’ (see Sutrop 2002). This hypothesis for Estonian can also be seen in the following tables.

It is interesting that English speakers do not make a difference between these two blues (dark and light), while all the other languages indicate it with the adjective *light* or *dark*. It is doubtful whether the English subjects were told to name the colour tiles only with simple colour names. If this is the case, tests with

English speakers should be repeated spontaneously, i.e. subjects could use all the colour names that come into their minds for the colour tiles.

Table 8. Names given to colour tile BV across languages.

Language	Term	Gloss	Percentage
Estonian	<i>tume-sinine</i>	dark blue	53%
Finnish	<i>sininen</i>	Blue	28%
Hungarian	<i>sötét-kék</i>	dark blue	26%
English	<i>blue</i>	blue	64%
Russian	<i>sinij</i>	(dark) blue	63%

Table 9. Names given to colour tile BGB T3 across languages.

Language	Term	Gloss	Percentage
Estonian	<i>hele-sinine</i>	light blue	40%
Finnish	<i>vaalean-sininen</i>	light blue	66%
Hungarian	<i>világos-kék</i>	light blue	46%
English	<i>blue</i>	blue	83%
Russian	<i>goluboj</i>	light (cold) blue	72%

Finally, in this subsection, I will discuss only white colour tile used in the colour naming test. Both English and Russian subjects all named this tile with the colour name *white* or *belyj*, respectively. Although *white* was the main answer given by three Finno-Ugric language subjects, they also gave many other answers, like *dirty white*, *house painter white*, etc. (all glosses translated to English), which makes the naming frequency and therefore also the consensus percentage lower.

Table 10. Names given to colour tile WHITE across languages.

Language	Term	Gloss	Percentage
Estonian	<i>valge</i>	white	84%
Finnish	<i>valkoinen</i>	white	59%
Hungarian	<i>fehér</i>	white	62%
English	<i>white</i>	white	100%
Russian	<i>belyj</i>	White	100%

The colour tiles described above are not the only colour samples for which one colour name in one language does not correspond to a colour name in the other language(s). All the examples described have been chosen subjectively by the author of the article.

5. Discussion and conclusion

In this article I examined, first, the distribution of colour terms in Ostwald's colour space in Estonian, Finnish, Hungarian, Russian and English, and tried to establish the best examples for every basic colour term in each of these languages. A first preliminary conclusion was elicited that these languages have a fully developed basic colour system with 11 basic colour term (Russian has been claimed to have exceptionally 12 basic colour terms; Finnish has to be studied further). Surprisingly, the distribution in colour space and best examples of colour vary – hence, they are not equal in related and non-related languages. It should be emphasized that there are no laws according to which languages behave in the same way, i.e. focal points of colours are placed in a same area, because neither the speakers of the two Indo-European languages nor the speakers of the three Finno-Ugric languages indicate the best examples of colour with the same colour tile. Actually, it would seem that this is the other way around. In English and in Estonian, the focal point areas for red and purple coincide; in Russian and English, only the area of purple coincides (colour tile V), because English subjects named it equally highly as the other tile RV (which is also the focal point of purple for Estonian speakers). Estonian and Russian have common focal points for pink and grey where they form a contrast to the focal points that are common for Finnish, Hungarian and English. Additionally, it is more common for the best example of colour to be shared by three languages than by two (Finnish, Hungarian and Russian for red (RO); Estonian, Russian and English for brown (O S3); Estonian, Russian and Hungarian for blue (BGB) etc. It should also be added that the focal point for green (YG), blue (B T1) and orange (O) differs in English from all the other languages considered in this study.

Secondly, I also examined names given most frequently to some colour tiles between languages, and analysed the answers. From this, it can be elicited that the differences, be they small or large, depend on the concrete colour sample. In general, however, it can be noted that modifying adjectives (especially those which correspond to the English *light* and *dark*) is used widely in all Finno-Ugric languages, in order to clarify the exact colour shade of a sample, while English and Russian speakers do not utilise them at all. Instead, English and Russian rely either on the basic colour term alone or on other non basic colour word (this holds true particularly for Russian). This phenomenon has also been pointed out by Barratt and Kontra, who studied the colour term correspondences between Hungarian and American English (1996). Sutrop, who has thoroughly investigated colour terms (with the field method of Davies and Corbett) as well as other sense perception vocabulary in Estonian, has noted that many modified compounds exist among colour words (2002). It also emerged from the studies by Davies and Corbett that not many modified terms were offered by native speakers of Russian or English (1994, 1995). The Hungarian data shows that it is possible to express any hue, shadow, tint, intensity, darkness or lightness with some compound in Hungarian, which makes the total number of colour words offered (over 1,100

different, over 10, 000 in total) higher than the number of colour words in English or Russian (Davies and Corbett 1994, 1995). Therefore, it is possible to claim that the number of colour words in Finno-Ugric languages is generally higher than that in English, for example.

The nomenclature of basic colour terms and the sequence in which they occur (starting with only two terms up to maximally eleven) is a language universal phenomenon, as Berlin and Kay have claimed, but as I have tried to show in this article, the best examples or focal points do not coincide across languages, not even in closely related languages like Estonian and Finnish.

By considering both of the questions posed in this article it can be concluded that the distribution of colour terms in colour space in one language does not correspond to the distribution of colour terms in other languages. The phenomenon would seem instead to be language-specific, and is possibly also affected with some cultural factors.

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Address:

Mari Uusküla
Institute of the Estonian Language
Roosikrantsi 6
10119 Tallinn
Estonia

Tel.:+372 6411 443

E-mail: mari.uuskyla@eki.ee

References

- Andrews, David R (1994) "The Russian color categories *sinij* and *goluboj*: an experimental analysis of their interpretation in the standard and emigré languages". In *Journal of Slavic Linguistics* 2, 9–28.
- Barratt, Leslie B. and Miklós Kontra (1996) "Matching Hungarian and English color terms". *International Journal of Lexicography*, 9, 2, 102–117.
- Berlin, Brent and Paul Kay (1969) *Basic color terms: their universality and evolution*. Berkeley: University of California Press. [Reprinted in 1991.]

- Bogatkin-Uusküla, Mari and Urmas Sutrop (2005a) "Tänapäeva ungari keele põhivärvinimed" [Basic colour terms of modern Hungarian]. *Keel ja Kirjandus* (Tallinn) 7, 558–570.
- Bogatkin-Uusküla, Mari and Urmas Sutrop (2005b) "Kas ungari keeles on kaks punase värvi põhinime piros ja vörös?" [Are there two basic colour terms for red in Hungarian?]. *Emakeele Seltsi Aastaraamat* (Tallinn) 50, 93–110.
- Corbett, Greville and Gerry Morgan (1987) „Colour terms in Russian: reflections of typological constraints in a single language“. *Journal of Linguistics* 24, 31–64.
- Crystal, David (1987) *The Cambridge encyclopedia of language*. Cambridge and New York: Cambridge University Press.
- Davies, Ian, C. MacDremid, G. Corbett, H. McGurk, D. Jerrett, T. Jerrett, and P. Sowden (1992) "Color terms in Setswana: a linguistic and perceptual approach". *Linguistics* 30, 1065–1103.
- Davies, Ian and Greville Corbett (1994) "The basic color terms of Russian". *Linguistics* 32, 65–89.
- Fletcher, Robert (1980) *The City University colour vision test*. 2nd ed. London: Keeler.
- Heider, Eleanor Rosch (1971) "“Focal” color areas and the development of color names". *Developmental Psychology* 4, 3, 447–455.
- Heider, Eleanor Rosch (1972) "Universals in color naming and memory". *Journal of Experimental Psychology* 93, 1, 10–20.
- Kicsi, Sándor András (1988a) "Az alapszínnevek lexikalizálásáról". [About the lexicalization of basic colour terms.] *Magyar Nyelvőr* 112, 4, 456–467.
- Kicsi, Sándor András (1988b) "Az alapszínnevek lexikalizálása". [Lexicalization of basic colour terms.] *Természet Világa* 1, 43–44.
- Kicsi, Sándor András (1991) "A magyar nyelv alapszínnevei". [Hungarian basic colour terms.] *Nyelvünk és Kulturánk* 82, 50–53.
- Kiefer, Ferenc (2005) "Van-e magyar jelentéstan?". [Is there such thing as Hungarian semantics?] *Magyar Nyelv* 2, 2, 129–140.
- Koski, Mauno (1983) *Värien nimitykset suomessa ja lähisukukielissä*. [Colour terms in Finnish and closely related languages.] Savonlinna: Suomalaisen Kirjallisuuden Seura.
- MacLaury, Robert E. (1997) *Color and cognition in Mesoamerica: constructing categories as advantages*. Austin: University of Texas Press.
- Paramei, Galina V. (2005) "Singing the Russian blues: an argument for culturally basic color terms". *Cross-Cultural Research* 39, 1, 10–34.
- Sutrop, Urmas (1995) "Eesti keele põhivärvinimed". [Basic colour terms of Estonian] *Keel ja Kirjandus* (Tallinn) 12, 797–808.
- Sutrop, Urmas (2000) "The basic colour terms of Estonian". *Trames* 4, 1, 143–168.
- Sutrop, Urmas (2002) *The vocabulary of sense perception in Estonian: structure and history*. (Opuscula Fenno-Ugrica Gottingensia, 8.) Frankfurt am Main, Berlin, Bern, Bruxelles; New York, Oxford, and Wien; Lang.
- Wierzbicka, Anna (1990) "The meaning of color terms: semantics, culture, and cognition". *Cognitive Linguistics* 1, 1, 99–150.
- Wierzbicka, Anna (1996) *Semantics: primes and universals*. Oxford and New York: Oxford University Press.