Sex, communism, and dangerous red things

On the semantics of the Hungarian words *piros* and *vörös*

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Abstract

The topic of Basic Colour Terms (BCT) and their proposed universality has long been a source of debate within linguistics. Whether colour terms (as symbols) fill lexical gaps of presumed universal colour categories (as senses) or not is relevant for the debate regarding linguistic relativity: the hypothesis about the influence of language on the way we think.

Until now, there has been a focus on different terms for GREEN and/or BLUE, and whether, for example, the two Russian terms for "dark blue" and "light blue" show that Russian speakers have two colour categories that differ from English speakers. Hungarian has two colour terms for RED (*piros* and *vörös*), but these terms have not been investigated within the field of linguistic relativity. However, there has instead been an extensive debate on whether one of the two terms, *vörös*, is to be considered a BCT at all. If *vörös* is a BCT, it opens up for the possibility of testing for linguistic relativity in Hungarian as well. But before such a test can be done, we must determine the basicness of *vörös*.

The focus of this thesis is therefore to investigate the semantics of the Hungarian words for RED: *piros* and *vörös*. The thesis consists of three studies, two of which were main studies: the first aimed to test for denotational differences between *piros* and *vörös*, and the aim of the second study was to test whether *piros* and *vörös* can be applied to the same objects, and if so, if there is a difference in semantic connotations between the two terms. The third study looked for a confirmation for the assumed difference in semantic connotations.

The results of the studies show that *vörös* should be considered a BCT. The term denotes a darker shade of red than *piros*, and has connotations of sex/passion and danger.

Keywords: linguistics, colour semantics, basic colour term, linguistic relativity, Sapir-Whorf-hypothesis, *piros*, *vörös*

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Preface and acknowledgments

I came up with the idea for this thesis when first reading about Linguistic Relativity. Being of Hungarian descent with extended family members still living in Hungary, I knew that the Hungarian language had two colour terms that, more or less, match the meaning of English *red*, and I wanted to test for Whorfian effects. This idea came to an abrupt stop when I came across the long debate on the "basicness" of one of the terms, *vörös*. Therefore, it was decided that I should investigate the semantics of *vörös* instead, which seemed like a rather fun task. In the process, I found myself back to some Whorfian issues.

Firstly, I would like to thank my supervisor professor Jordan Zlatev for being patient, extremely helpful, and for his ways of pushing me forward when I needed it and putting me back on earth when my head was in the clouds.

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1. Introduction

What are colours and how do we speak about them? Everyone but blind people can see them, and we seem to take colours as a natural and universal aspect of the (life) world. The sky is blue, leaves are most often green (unless it is autumn), flowers are all kinds of colours. But with little reflection, we can see that colours are not only "natural" but also part of culture. We use colours when we engage in art, fashion, religion, and politics. In one culture, white can be the colour used at funerals or when in mourning (for example, Hindu widows are expected to use white while in mourning), and in another one white is used by the bride at a wedding (historically typical for Western countries). We also use colour terms to talk about things that do not correspond to the specific colour category: a *red-haired* person often has hair that would be called orange if it belonged to any other object than hair. A *red fox* is not so much red as it is brownish-orange. *White wine* is seldom white, but rather yellowish, and to say *John is green* is (most likely) a metaphor, standing for inexperience, or envy, depending on the context.

The words we use to denote colours are even more variable across languages and cultures. Whether the colour terms influence the way we think about colour (concepts) and perceive colour (categories) has been a long-term controversy (see e.g. Özgen & Davies 1998; Roberson & Hanley 2010). At least in some cases, an effect of language upon colour perception has been demonstrated. Russian has two different terms for the category BLUE[1]. Where English speakers would use a modifier to denote lighter and darker shades (*light* blue vs *dark* blue), Russians tend to use *siniy* for dark blue and *goluboy* for light blue. A colour perception experiment performed by Winawer et al. (2007), revealed differences in colour discrimination between Russian and English speakers that could be attributed to these language differences. The Russian speakers, presumably influenced by the semantic structure of their language, matched the two "blues" more easily and faster than the English speakers did. In other words, it may be warranted to say that Russian speakers operate with two different colour categories: L-BLUE and D-BLUE.

At the same time, there seem to be constraints on linguistic variation in colour terms, shown by the influential study of Berlin and Kay (1969) on basic colour terms (henceforth, BCT),

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[1] Here, and in the remainder of this thesis, CAPITALS will be used for colour categories and concepts, and *italics* for color terms, as well as for linguistic examples in general.

which seems to indicate rather strong independence between colour categories and terms. It has remained controversial how to reconcile Berlin and Kay's universal hierarchy according to which colour categories are lexicalized, with cases such as the different terms for BLUE in Russian, showing a considerable degree of cross-linguistic variation. Furthermore, there have been debates on how to apply Berlin and Kay's criteria for what is a BCT. These issues will be further reviewed and discussed in Chapter 2.

In this context, the two terms used in Hungarian for the category RED, *piros*[2] and *vörös*[3], which are the focus of this thesis, have been particularly troublesome. Berlin and Kay, and a number of other linguists, considered both terms to be basic colour terms, including the "emotionally charged" term *vörös*. Papp (2009), for example, comes to the conclusion that *vörös* fulfils the main criteria for a BCT. On the other hand, other linguists question the basicness of *vörös* based on either low frequency in a colour-naming task (Uuskula & Sutrop 2007) or on high degree of idiomatization, purportedly similar to the case of the *red fox* above (Benczes & Tóth-Czifra, 2014).

One possible way to resolve this debate is to propose that *vörös* is a BCT, but contrasts with *piros* not so much with respect to differences in colour shade (as in the case of the Russian terms siniy and goluboy), but with respect to semantic connotations (see Section 2.2). In particular, *vörös* is often described by native speakers as an "emotionally charged" colour term, associated with feelings such as *violence* and *passion*. Benczes and Tóth-Czifra (2014) propose that the etymology of the word might have something to do with the emotional value of the term. It is derived from the term *vér(es)*, meaning blood(y), which could be the reason for the emotional connotations. Interestingly, no experimental evidence has been provided to support this proposal. Further, even if this is the case, it is still possible that *vörös* and *piros* also differ in terms of (prototypical) colour hues.

This thesis aims to clarify these issues and addresses the following questions:

- What is the semantic difference between *vörös* and *piros*?
- Does *vörös* function as a (BCT) in Hungarian?
- What kind of implications does this have for the debate between universalism and relativity in colour semantics?

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[2] Pronounced [ˈpiroʃ]
[3] Pronounced [ˈvørøʃ]

These questions were addressed in three empirical studies, described in Chapters 3-5. The first study was a colour naming task aiming to establish which colour shades are denoted using *piros* and *vörös* respectively (Chapter 3). The second study involved a referential game, where native speakers were asked to describe pictures of objects which, following a 2x2 design, differed in colour shade and connotations such as "dangerousness", based on the author's intuitions (Chapter 4). But do Hungarians really perceive the objects depicted in the second study as more or less dangerous/emotionally charged, as expected? This was tested in a third study, through a questionnaire (Chapter 5).

In Chapter 6, I discuss the implications of the study, including for the relation between colour terms and colour categories/concepts and Chapter 7 presents a conclusion.

2. Theoretical Background

2.1 Introduction

A recurrent controversy in the cognitive sciences, including linguistics, is to what extent meanings differ across languages (i.e. the issue of semantic universality vs. variation), and if so, to what extent such differences affect thinking (i.e. the issue of cognitive universality vs. variation) (Whorf 1956; Pinker 1994; Zlatev & Blomberg 2015). When it comes to colour, the question is whether colour categories are universal and differences in colour terms are only "on the surface", or whether we actually have different colour categories, and if so, is this an effect of language on thinking? (Roberson & Hanley 2010).

In this chapter, I address the relation between colour categories and colour terms, and between basic and secondary colour terms. I also give a background to the debate on the Hungarian colour terms, both the basic and secondary ones. This background review identifies the knowledge gap which my study addresses, concerning the semantics of the Hungarian colour term *vörös*. But first of all, I introduce a few key semantic terms which will be important for the discussion.

2.2 Key semantic terms

The field of semantics – the systematic investigation of linguistic meaning – is a highly interdisciplinary area, involving linguistics, anthropology, philosophy and psychology (Riemer 2010; Saeed 2016). A classical model of word meaning (Ogden & Richards 1923), is to distinguish between symbols (signs), their designations (referents) in the life-world, as well as concepts (senses) that mediate this relation. In Saussurean terms (Saussure 1974), symbols are *signifiers* and concepts is *the signified*, and it is only through these that referents are accessible. The three aspects of meaning (*symbol*, *referents* and *senses*) are shown in Figure 1 below, based on Ogden and Richards (1923).

Sense
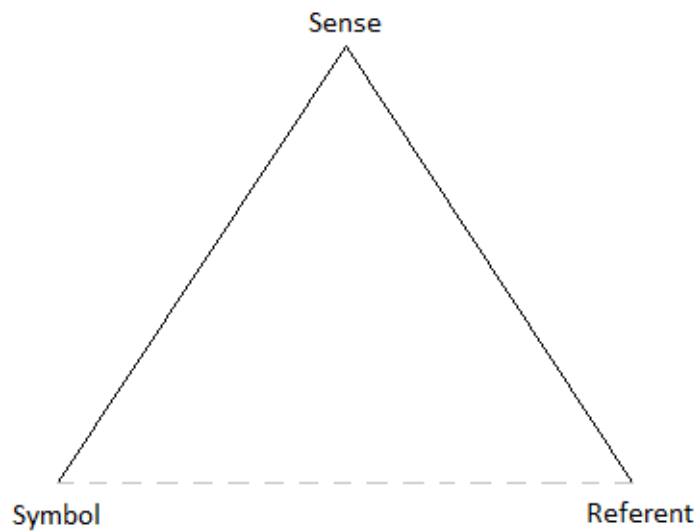
Symbol   Referent

Figure 1. The "semiotic triangle": symbols/signifiers denote referents, via senses/signifieds

The *symbol* corner (left corner) would be the *word* in a language, and the *referent* (right corner) is the life-world object that the word denotes. The top of the triangle (which Ogden and Richards name *thought* or *reference*) is the same place where we would place the terms *sense* or *concept*.

The senses may differ from one another in terms of value-based associations. For example, the words *dog* and *mutt* (which are *symbols*, i.e. the left corner in the semiotic triangle) in English both denote the real-world category of dogs (the designation or referent, i.e. the right corner in the triangle), but through different meanings: DOG and MUTT, which possess different semantic values (top corner in the triangle). In particular, the word *mutt* has certain semantic associations which the word *dog* does not have, as it is used in a derogative sense when talking about dogs. When words have the same denotation, but differ in terms of meaning, it is customary to say that they differ in terms of *connotation*. These theoretical terms are used differently in different semantic theories, but for present purposes, I follow Riemer (2010), though disagreeing with his statement that connotation is separate from sense:

> Sense, reference and denotation are three aspects of what is commonly conveyed by the loose term 'meaning'. A fourth, very important aspect of meaning is **connotation.** Connotation names those aspects of meaning which do not affect a word's sense, reference or denotation, but have to do with secondary factors such as its emotional force […]" (bold in original) (2010:19).

Riemer also points out that the difference between *synonyms* often lie within the words' connotations: synonyms typically denote the same thing (the way *mutt* and *dog* both denote the category of dogs) and have similar (though not identical) senses (both mean DOMESTIC CANINE) but they have different connotations. In the case with *dog* and *mutt,* one is neutral and the other derogative.

Colour semantics is the part of semantics concerned with the systematic investigation of meaning of colour terms, and how different (perceptual) colour impressions, as well as other extended meanings, such as connotations and metaphors, are conveyed in such terms (Biggam 2012). Colour terms, such as *blue* and *red*, denote certain perceptual colours, but they can also - depending on context - be used figuratively, as when people say that they are *feeling blue* when what they mean is that they are feeling sad. This metaphorical meaning of the phrase *feeling blue* can be described as deriving from a process of *idiomatization*, where as in the classical example of *throwing in the towel* (with the meaning GIVE UP), the meaning of the phrase does not follow compositionally from its parts. At the same time, we would not wish to say that this extended meaning of *blue* (SAD) can occur *only* in this particular phrase. Hence, the colour term *blue* is not fully idiomatized, i.e. restricted to a very specific context, where it occurs with a figurative meaning, but is also a colour term denoting the colour hue of an entity. In general, there is cline between compositional and idiomatic constructions (Goldberg 1995).

2.3 Colour Categories and Colour Terms: different but related

Given what was said above, we conclude that colour categories are related to colour terms, but they are nevertheless distinct. Colour categories are what we visually perceive (the life-world referent), whereas colour terms are the words we use to describe what we perceive. As stated in Chapter 1, when a colour word is written in upper case (RED) it is referring to the colour category, and when it is in italics (*red*) it is referring to the colour term. Human beings perceive many more colours than we have terms for, which makes the area of colour semantics a very interesting one. Instead of having thousands of colour terms in our daily vocabulary, we tend to have between zero and twelve basic colour terms, and within those colour terms, we use sub-terms or modifiers to talk about variants. For example, English speakers may modify the category BLUE by saying *sky blue* or the category GREEN by saying *dark green* or *moss green* instead of coming up with a proper term for the colour

variant. If an object has a colour in between two categories an English speaker might say that it is *orange-red* or *blue-ish purple*. Even though we know there are many colours on the border between two colour categories, we do not use specific words for those border colours, but rather use modifiers such as *light* or *dark* to modify a presumed category. The question is, do we use a specific set of colour categories because they are somehow universal? This view has been proposed by several linguists (e.g. Regier, Kay & Cook 2005), and I will review the most influential universalist study (Berlin & Kay 1969) in 2.4.

However, several linguists have questioned the universalist claim (Davidoff 2001; Wierzbicka 2008; Roberson & Hanley 2010), arguing that colour terms vary too much across languages and cultures for colour categories to be universal. For example, some languages divide the category BLUE into two terms, as the Russian language with its colour terms *siniy* (dark blue) and *goluboy* (light blue), as pointed out in Chapter 1, or the Turkish language with its terms *lacivert* (dark blue) and *mavi* (blue). Other languages might include two categories in the same colour term: an example of a language that does this is Welsh, which does not distinguish between BLUE and GREEN in its use of colour terms. This is sometimes referred to as a macro-category, that could be called GRUE (Biggam 2012).

These two views – the universalist and the variation/relativist positions – are parts of a long-term debate within linguistics on whether certain categories or concepts are innate (and hence universal), or if the categories are formed by our way of speaking about them (and hence variable). The debate is not restricted to colour terms (e.g. Pinker 1994), and also includes linguistic notions such as *gender* (Kousta, Vinson & Vigliocco 2008) and *space* (Majid et al. 2004). However, colour categorization is one of the most researched – and debated – areas. If it would turn out that the universalist view does not hold in the colour area and colour categories are not universal, this open up for the linguistic relativity hypothesis. In other words, if human beings categorize colours differently cross-linguistically, this might be a result of linguistic influence on thinking. If colour categories on the other hand turn out to be universal, then any influence on cognition from colour terminology would be at most minimal.
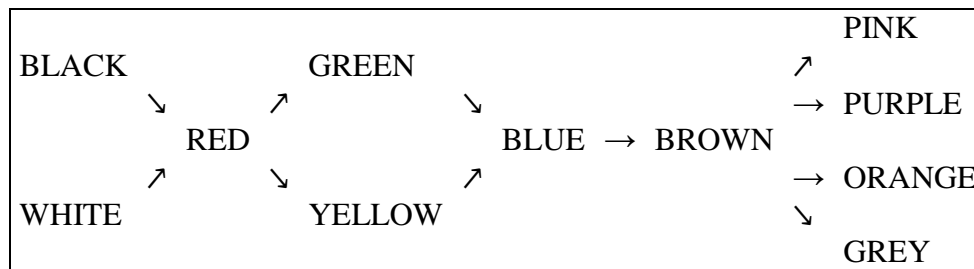
Consequently, several studies have been made to test whether there are cross-linguistic differences in colour categorization, some of the studies supporting a universalist view, and some pointing towards a relativist position. Roberson, Davies and Davidoff (2000) tested English and Berinmo speakers for categorization differences. Berinmo speakers do not divide BLUE or GREEN into two different colour terms the way English speakers do, but rather use

a term referring to something similar to GRUE, and have a colour term boundary in a place where English speakers do not. Critics from the universalist camp, however argued that this study was a memory task, which could at most show linguistic influence on *memory* - the use of a linguistic label might have helped the speakers remember a specific colour but not on colour categorization per se (Muunich & Landau 2003).

Winawer et al. (2007) performed a similar task with English and Russian speakers, but excluded the influence of a memory bias by letting the participants look at the target and distractor colours simultaneously. As mentioned earlier, Russian divides the presumed colour category BLUE into two distinct colour terms, *siniy* ('dark blue') and *goluboy* ('light blue'). The researchers presented their participants with three blue-coloured squares in a triad (with one square on top and two at the bottom). One of the bottom squares was the same shade as the top square while the other bottom square was a different shade of blue. The participants where then asked to choose which one of the bottom squares resembles the top square the most. The squares were shown on screen until the question was answered, so there was a minimal demand on memory for the task. The study found that Russian speakers were faster than English speakers at this task. These results suggest that mutually exclusive colour terms within a presumed category (in this case, the category BLUE) in a language also affect the categorical distinction in perceptual, non-linguistic, tasks. The most straightforward interpretation is thus that the Russian speakers do not have the category BLUE, but rather two different colour categories L-BLUE and D-BLUE, which would put the universalist claim about colour categories on edge.

2.4 Basic Colour Terms

The notion of Basic Colour Terms (BCT) was introduced by Berlin and Kay (1969): *Basic Color Terms: Their universality and evolution*. As the title of the book implies, Berlin and Kay considered colour terms to be in a sense "universal", as people supposedly share the same colour categories. Furthermore, the theory proposes that all languages evolve their basic colour terms in a specific order, filling up "categorical gaps" as shown in Figure 2.

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┌─────────────────────────────────────────────────────────────────────┐
│                                                        PINK           │
│  BLACK                GREEN                              ↗             │
│         ↘        ↗                ↘                     → PURPLE       │
│            RED                 BLUE  →  BROWN                          │
│         ↗        ↘                ↗                     → ORANGE       │
│  WHITE                YELLOW                             ↘             │
│                                                        GREY           │
└─────────────────────────────────────────────────────────────────────┘
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Figure 2. Berlin and Kay's proposed order in which basic color terms "evolve", i.e. the order in which the universal colour categories become lexicalized in the world's languages

 In other words, according to Berlin and Kay all languages are expected to develop BCTs in a specific order and with specific focal colours. For instance, if a language has only two BCTs those should correspond to the categories BLACK and WHITE, and if a language has three BCTs, the third would correspond to the category RED. The fourth and fifth BCTs correspond to GREEN or YELLOW, the sixth to BLUE, the seventh to BROWN, and then follow PINK, PURPLE, ORANGE and GREY (the last four without internal order).

The basic colour terms in different languages are expected to denote the same categories, but may have different form[4] (unless they are loan words). For example, the category RED can be denoted by *red* in English, *röd* or *rött* in Swedish, and *rojo* in Spanish. The category GREEN is denoted by words as different as *green* in English and *zöld* in Hungarian. ORANGE on the other hand is denoted by *orange* in English and by a close cognate in Swedish, since it is a loan word in Swedish.

As should be obvious from this short review, Berlin and Kay's theory is anti-relativistic, and may give the impression that the question of linguistic relativity has been solved once and for all (see Pinker 1994). However, this is far from true (Zlatev & Blomberg 2015). Furthermore, there has been an ongoing methodological debate on how exactly to define and operationalize the notion of "basic colour term". The criteria are in some parts quite open to interpretation, and Berlin and Kay even added four subsidiary criteria to be used in doubtful cases. The criteria seem to sometimes cause more confusion than clarity, and some studies that interpret the criteria differently were discussed in 2.3. The fact that Berlin and Kay needed to added subsidiary criteria to begin with, points to some built-in flaws in the original criteria.

Berlin and Kay's criteria for BCTs are as follows: (i), a BCT must be monolexemic. (ii), its signification is not included in other colour terms; they give the example of *crimson* being a

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[4] The only *form* that Berlin and Kay claim that basic colour terms have in common is that they are monolexemic.

kind of *red* (iii), it cannot be restricted to certain objects but must be able to work as an adjective to *any* object. And, (iv), the term must be salient among speakers of the language, regardless of dialects, sociolects etc.

For example, the English terms *red*, *blue,* and *orange* all fulfil the criteria of being BCTs, but colour terms such as *sky blue* or *forest green* do not fulfil the first criteria of being monolexemic (not even if they were compounds as in Swedish: *himmelsblå* and *skogsgrön*). The colour term *blonde* on the other hand is monolexemic, but does not fulfil the criterion of functioning as an adjective to any object, since it is only used for hair. Berlin and Kay's added subsidiary criteria are as follows (1969:6-7):

> (v) The doubtful form should have the same distributional potential as the previously established basic terms. For example, in English, allowing the suffix *-ish¸* for example, *reddish*, *whitish*, and *greenish* are English words, but **aguaish* and *chartreus(e)ish* are not.

> (vi) Color terms that are also the name of an object characteristically having that color are suspect, for example, *gold*, *silver*, and *ash*. This subsidiary criterion would exclude *orange*, in English, *if* it were a doubtful case on the basic critera (i-iv).

> (vii) Recent foreign loan words may be suspect. [5]

> (viii) In cases where lexemic status is difficult to assess [see criterion (1)], morphological complexity is given some weight as a secondary criterion. The English term *blue-green* might be eliminated by this criterion.

As we have seen, one of the central claims of the theory is that languages should not have more than these eleven BCTs. However, Berlin and Kay acknowledge that Hungarian

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[5] One example of a case where the interpretation of the criteria is troublesome is the Hungarian colour term *bordó* ("bordeaux" = dark red blue-ish coloured). Uuskula and Sutrop (2007) dismiss this colour term on the basis of it being a recent loan word, which is considered "suspect" according to one of Berlin and Kay's subsidiary (vii) criteria. However, Uuskula and Sutrop also mention that the word in its current form was found in a Hungarian text already 1897 (2007:119), so their definition of *recent* loan word should be met with scepticism. It is further problematic that Berlin and Kay did not define what they meant by "recent" loan word. *Vörös*, however, is not a loan word and therefore fulfils this subsidiary criterion without question.

"presents a special case" (1969:35) with its two terms for RED: *piros* and *vörös*. They even admit that "[i]f this finding is borne out by future research, it may be possible to suggest developmental stages other than those already mentioned." (1969:35). In other words, the fact that Hungarian seems to have two terms for RED was a problematic finding for a colour theory which claimed universality in basic colour term development based on universal colour categories.

To defend their theory, Berlin and Kay provide a possible explanation for the existence of two terms for RED in Hungarian, claiming that *vörös* might be a case of a less salient colour term, and that the two reds have a semantic relationship where *piros* means RED and *vörös* is included in *piros* (the same way as *crimson* is a *kind of red* in English), thus excluding *vörös* as a BCT on the basis of criterion (ii). They propose that situation is analogous to the two Russian blue terms, *siniy* and *goluboy*, where they claim that *siniy* has the meaning of BLUE and has the meaning of dark blue *only* in contrast with *goluboy* (light blue). Furthermore, they claim that *goluboy* is less salient than *siniy,* and is learned later by children, and should therefore be considered a secondary rather than a basic colour term. Consequently, if this is a valid analysis for the case of two Russian terms for BLUE, a similar explanation may apply to the Hungarian terms under investigation, as shown in Figure 3.

Siniy (BLUE)		Piros (RED)	
↙	↘	↙	↘
Siniy	Goluboy	Vörös	Piros
(dark blue)	(light blue)	(dark red)	(light red)
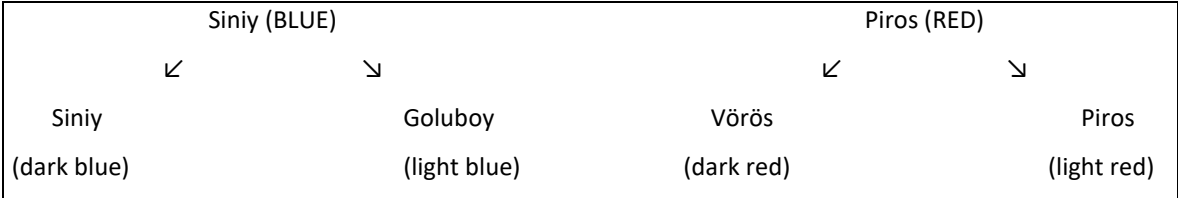
Figure 3. Berlin and Kay's proposed semantic relationship in Russian terms for BLUE and Hungarian terms for RED.

It should be noted, however, that Berlin and Kay had reservations: "**[i]f** this formulation is generally correct, *goluboy* must be a secondary term in Russian. The same argument **may perhaps apply** to Hungarian *vörös* […]." (My bold, italics in original). This shows the need of more research in the area, to clarify whether *goluboy* really is to be considered a variant of *siniy*, and if *vörös* is to be considered a variant of *piros*. As discussed in the previous section, the study of Winawer et al. (2007) seems to show that the two Russian terms *goluboy* and *siniy* indeed correspond to distinct colour categories. Furthermore, it should not be assumed

that any argument about the Russian blue terms is automatically applicable to the Hungarian red terms, or vice versa. The two languages colour terms should be tested separately, without assumptions based on another language's presumed basic or secondary colour terms.

2.5 Basic (and Secondary) Colour Terms in Hungarian

The basic colour terms in Hungarian according to Berlin and Kay (1969) are *fekete* (black), *fehér*[6] (white), *kék* (blue), *zöld* (green), *sárga* (yellow), *barna* (brown), *lila* (purple), *rózsaszin* (pink), *narancssárga* (orange), *szürke* (grey) and either only the first, or both *piros* (light/bright red) and *vörös* (darker red). Indeed, there are additional studies (other than Berlin & Kay's) claiming that the two "reds" are not basic colour terms, but rather that *piros* is a basic colour term and *vörös* is a secondary colour term. For the present context, the debate concerning the BCT status of *vörös* is most relevant, but arguments regarding the other colour terms will be mentioned as well, to contrast with the debate on *vörös*. I will start by reviewing the researchers that claim that both *piros* and *vörös* are basic colour terms, and then review the researchers who claim *vörös* is a secondary colour term.

Csapodi (1899) proposed that *piros* and *vörös* are used for two different shades of red, where *piros* is used when the red leans towards bluer shade and *vörös* is used when the red is more brownish (see Benczes & Tóth-Czifra 2014:124).

Papp (2009) calls into question whether *narancssárga* is to be considered a basic colour term in Hungarian, since it is clearly not monolexemic and literally means "orange-(NOUN) yellow", i.e. "yellow as the fruit orange". Similarly, the term *rózsaszín* ("pink") does not appear to be basic, since it literally translates to "rose colour". Papp claims that Hungarian only has ten basic colour terms, one of which is *vörös*, since it, unlike *narancssárga* and *rózsaszín* fulfils the criteria (i-iv) for Berlin and Kay's basic colour terms. Furthermore, *vörös* ends up on the 7th place in a frequency of occurrence in Hungarian National Corpus (*piros* on 5th place), thus outranking other BCTs such as for example *barna* (brown) and *lila* (purple) when it comes to frequency. Papp's analysis is, of course, problematic for the theory of colour terms as being universal, not so much for the dismissing of *narancssárga* and *rózsaszín* (since they anyway belong to the later levels in the BCT evolutionary hierarchy, see Figure 2), but for the claim that *vörös* must be a BCT together with *piros*.

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[6] Berlin and Kay used the (incorrect) spelling *fejér*.

Benczes and Tóth-Czifra (2014), on the other hand, claim that the status of *vörös* as a BCT is highly questionable, since it has undergone a certain degree of idiomatization and is often used in cases where the meaning of the term does not completely correspond to the RED category to begin with (as in: *vöröshagyma*, "[red] onion"), or in a figurative sense (as in: "the Red Army"). Furthermore, they conclude that *vörös* is more often associated with negative emotions, something that *could* derive from the colour term being referred to as a darker shade, since darker shades "are often used to describe negative concepts, while brighter colours are more usually associated with positive concepts." (ibid 2014:133). They discuss the etymology of *vörös* being a reason for the negative association, since the word is assumed to be derived from the word *vér* meaning "blood" and therefore associated with strong emotions, blood, and passion.

In apparent agreement with the aforementioned authors, Uuskula and Sutrop (2007:120) claim that *vörös* is "by no means a basic colour word in Hungarian" (based on the low frequency of *vörös* in their data), interpreting this as evidence that *vörös* is not salient among speakers. However, this claims seems to due to leaving out instances of *vörös* deemed to be "idiomatic". But if a colour term both denotes a colour shade and connotes certain feelings, its frequency in a pure, "non-emotional" colour naming task may indeed be low. This however does not exclude the term from being a BCT. Firstly, the term can be psychologically salient without being frequent in a colour naming task. Secondly, *vörös* has shown a high frequency in other studies (e.g. Papp 2009). Thirdly, Berlin and Kay did not take semantic connotations into account at all in their theory on BCTs, possibly assuming that such are irrelevant for the theory. Fourthly, as Wierzbicka (2008) has pointed out, the debate within colour semantics has tended to assume that English just happens to have filled all the lexical gaps for universal categories (2008:408). On the contrary, it is possible that *vörös* is a good example of a colour term that does not fit the English mapping, but might nevertheless correspond to a colour category. Hypothetically speaking, if Berlin and Kay would have been Hungarian speakers instead of English, perhaps the Hungarian colour terms would have laid ground for the universal colour category debate, and then English would have been a language that has a lexical gap.

2.6 Summary and hypotheses

As the review of the literature presented in this chapter has shown, the three research questions formulated in Chapter 1 remain both relevant and unanswered:

- What is the semantic difference between *vörös* and *piros*?
- Does *vörös* function as a basic colour term (BCT) in Hungarian?
- What kind of implications does this have for the debate between universalism and relativity in colour semantics?

To address the first question, it is not sufficient to use only corpus analysis, which is mostly based on written texts and does not show how the colour term is used in a natural, spontaneous, spoken context. In addition, colour naming tasks are not sufficient either, especially if the differences between the terms concern connotations, as well as denotations.

That is why this thesis addresses the questions using a mixed methodology. Chapter 3 describes a study aiming to establish if there are purely denotational differences between the two terms, and proposes the following hypothesis.

Hypothesis 1: There is a denotational difference between *vörös* and *piros* in terms of shade, with *vörös* being the darker of the two.

Using the results from Chapter 3, I proceed in Chapter 4 with a study in which pictures showing objects that can either be expected to be associated with passion/danger (e.g. a devil or red star) or not (e.g. a teddy bear) are given in a lighter and darker shade of RED. It is these objects, and not the colours themselves that are to be "named".

Hypothesis 2: The use of *vörös* will be in part predicted by the hue and shade (see H1), and in part by the category of the object (dangerous, non-dangerous).

In addition, the study in Chapter 4 aims to show if both *vörös* and *piros* can be applied to the same objects; so, it cannot be the case that *vörös* appears only in certain fixed expressions, which means that it is not fully idiomatized.

Hypothesis 3: The meaning of *vörös* is productive, i.e. can be applied to any object, based on its denotational or connotational senses, or both.

To the extent that these three hypotheses are confirmed, and given that the other criteria are fulfilled (see Section 2.3) the second research question could be answered positively: *vörös*

does indeed function as BCT in Hungarian. This opens up the issue of (non)universality of colour semantics and cognition, to be addressed in the discussion in Chapter 6.

However, prior to that we need to address a methodological concern: that the categories "dangerous" and "non-dangerous" were formulated in an ad hoc way, using only the author's intuitions. Hence, Chapter 5 reports the results from a study based on a questionnaire aiming to test whether these intuitions are intersubjectively shared by native speakers of Hungarian.

3. Do *vörös* and *piros* differ denotationally? (Study 1)

3.1 Introduction

This chapter describes a preliminary study, aiming to show if there is a purely denotational sense-difference between the two (main) Hungarian terms for RED. As all previous research seems to agree that if there is such a difference, *vörös* should denote a darker shade than *piros*, this is what was expected to be shown in the results, thus supporting Hypothesis 1. A second purpose of the study was to help decide which shades for *piros* and *vörös* to use in the second study, described in Chapter 4.

3.2 Method

The study used a rather traditional colour naming task, where participants were shown slides with coloured squares in a PowerPoint presentation. All squares showed 16 different shades of RED, some of them bordering on ORANGE and BROWN. The colour shades were set by a so-called "RGB number". RGB is an abbreviation for "Red, Green and Blue", and is a model for reproducing colours by mixing red, green and blue in various ways. A RGB value is defined by a set of numbers, ranging from 0 to 255. The numbers are set together in three "slots" to reproduce a colour, each slot representing each of the three colours RED, GREEN and BLUE The first slot is the amount of red, the second is the amount of green, and the third is the amount of blue. For example, to have a clear RED we would use the RGB number 255.0.0. - since the first slot is for RED, and 255 is the highest number that can be used in the model. For a clear GREEN we would use the RGB number 0.255.0. For a PURPLE colour hue we would use a RGB number which is a mixture between quite high levels of RED and BLUE, for example 128.0.128.

The sixteen different RGB values used in the study are shown in Table 1. Each coloured square was shown twice, so that in total each participant saw 32 slides. The participants were not given any information that every shade was shown twice, and simply asked "Piros vagy vörös vagy mi?" (lit: Piros or vörös or what [is this]?") which was written above the colours in each slide. The slides were presented to each participant in one of three orders which were produced by pseudo-randomization.

Table 1. RGB (Red, Green, Blue) values used in Study 1.

RGB value	255.0.0.	240.0.0.	230.0.0.	210.0.0.	200.0.0.	180.0.0.	160.0.0.	140.0.0.
Colour								

RGB value	255.60.0.	255.50.0.	255.40.0.	230.50.0.	255.0.50.	230.0.50.	200.0.50.	180.0.60.
Colour								

3.3 Participants

Six monolingual speakers were tested in North-Eastern Hungary. In addition, two Hungarian speakers were tested in Sweden, which gives a total of eight participants (four females and four males). The youngest participant was 6 years old and the oldest 79. There were few participants partly because the study was meant only as a pre-test for Study 2, and partly because that amount of participants was what I was able to recruit during a very short travel in Eastern Hungary. The six monolingual speakers were all recruited in a small village that I visited for two days, and the two additional participants are Hungarian friends of mine living in Sweden and Denmark.

3.4 Results

The responses of the eight participants of *piros* and *vörös* in the colour naming task are shown in Table 2. Tables including all other responses, and the answers for each participant, can be found in Appendix D and E. The table shows how many times each colour term was used for a colour stimulus. All occurrences of *sötétpiros* and *világospiros* are counted as *piros* in Table 2, but separated in the Appendix. To remind, each colour was named 16 times, since there were eight participants and the colours were shown twice for each participant.

Table 2. The responses distribution in Study 1.

RGB value	255.0.0.	240.0.0.	230.0.0.	210.0.0.	200.0.0.	180.0.0.	160.0.0.	140.0.0.
Colour								
Piros	14	11	14	11	5	1	1	0
Vörös	1	2	1	3	7	7	3	1
Other	1	3	1	2	4	8	12	15

RGB value	255.60.0.	255.50.0.	255.40.0.	230.50.0.	255.0.50.	230.0.50.	200.0.50.	180.0.60.
Colour								
Piros	6	7	10	9	14	5	2	1
Vörös	0	0	0	0	0	7	8	0
Other	10	9	6	7	2	4	6	15

Firstly, the results of the colour naming task showed that none of the shades bordering on ORANGE were described as *vörös*, but rather as *narancs* ('orange'), *narancssárga* ('orange-yellow'[7]), *világospiros* ('light red'), *narancspiros* ('orange red'), or *piros* ('red'). Secondly, all other shades were at some point denoted as *vörös*, except for RGB 255.0.50 (which was either *piros* or *rózsaszín*), and RGB 180.0.60.[8] Thirdly, *vörös* was the most frequently used term for several of the darker shades, in particular 200.0.0, 200.0.50 and 230.0.50. In some cases, *vörös* also seemed to coincide with *bordó* ("*bordeaux*") on the "bluer" shades.

Importantly for Hypothesis 1, there seemed to be an inverse relationship between *vörös* and *piros* – with the latter being almost never used for RED values lower than 200. The most common shades for *piros* were RGB 255.0.0 and 255.0.50, where *vörös* was hardly every used. Thus, to treat *vörös* as a sub-category of *piros*, as proposed by Berlin and Key (see Figure 2, Section 2.3), is at least questionable.

3.5 Summary

This chapter described a preliminary study, which nevertheless provided support for Hypothesis 1, indicating that the terms *vörös* and *piros* differ in terms of denotation. Where *piros* seems to be used mostly for bright/light RED and leans towards ORANGE, *vörös* was

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[7] *Narancssárga* is the term for denoting ORANGE, and is sometimes shortened to *narancs* (see Section 2.4)

[8] RGB 180.0.60. had at one point the modifier *barna* (brown) and was named *barnasvörös.* In general, this colour hue seemed hard to define since it was given as much as eight different names, for example *bordó* (bordeaux), *sötétpiros* (dark red), *lila* (purple), *lilaspiros* (purple red), and *sötétrózsaszín* (dark pink).

used for darker RED and red shades that lean towards BLUE. The most common shades for *piros* in the study were RGB 255.0.0. and 255.0.50, and the former was chosen for *piros* in Study 2. The most common shades for *vörös* were 200.0.0., 180.0.0., and 200.0.50, and the first of these was used for the study described in the following chapter.

4. Denotation and connotation differences between *vörös* and *piros* (Study 2)

4.1 Introduction

This chapter deals with the main empirical study used in this thesis, addressing in effect all three hypotheses, repeated here:

- Hypothesis 1: There is a denotational difference between *vörös* and *piros* in terms of shade, with *vörös* being the darker of the two.
- Hypothesis 2: The use of *vörös* will be in part predicted by the shade (see H1), and in part by the category of the object (dangerous, non-dangerous).
- Hypothesis 3: The meaning of *vörös* is productive, i.e. can be applied to any object, based on its denotational or connotational senses, or both.

As we saw from the previous chapter, there does indeed seem to be a denotational difference between the two colour terms with respect to shade (H1), but we still don't know how this will interact with the kinds of connotational differences claimed to exist between the terms (H2). Also, to fully support the status of *vörös* as a basic color term (BCT) in Hungarian, we need to show that it is not restricted to so-called "idiomatic" uses and can be used with a variety of objects.

One important methodological requirement was that participants would describe coloured objects without explicitly focusing on, and reflecting on the colour term used, so that the choice of colour term would come in a natural, spontaneous way.

4.2 Materials

It was important to choose an appropriate set of objects, which could in principle be described using either *piros* or *vörös*. For this purpose, the Hungarian National Corpus (HNC) was first used to find collocations of *piros*/*vörös* + noun. In a second step, Google search was used to double check that the collocations in question were not idiomatic in the manner of *red fox* where *red* does not denote a prototypical value of RED, or *red gold*, which in English can only mean a certain type of gold jewellery.

Using this procedure, the following collocations of *arany* ('gold') could be excluded: *piros arany* (135 hits in HNC) denotes a certain form of red pepper cream that is common in

Hungary, and *vörös arany* (64 hits in HNC) means *red gold jewellery* (as the English meaning). Only looking at frequency in the corpus would not have given such information, which is why Google search was needed as a complement.

20 objects were chosen for the experiment, and were then represented by pictures. Half of the pictures were chosen for having sexual/passionate/dangerous connotations, such as REVEALING DRESS, RED STAR or DEVIL, and the other half of the pictures were chosen for having neutral or positive connotations, for example TEDDYBEAR or TOMATO, to be described and motivated in more detail in Chapter 5. The pictures were all borrowed from an open source webpage with clipart images[9], and mainly modified in colour.[10] The pictures were modified in an image manipulation program called GIMP.[11] All 20 pictures were modified and duplicated so that one set had RGB 200.0.0., and one set RGB 255.0.0, which, as described in Chapter 3, appeared to be the prototypical denotational values for *vörös* and *piros*, respectively. This resulted in 40 red pictures for the experiment, half of them being "bright red" (B-RED) and the other half "dark red" (D-RED). In addition, 40 pictures of the same objects were modified into blue, green, purple, orange, pink, and yellow, and where meant to function as distracters for the participants.

The total set of pictures were then divided into two tests, as to make sure the participants would never see the same object with two different shades of RED. These two tests are henceforth referred to as Test A and Test B. In Test A, all the "dangerous" objects were D-RED, and in Test B, all the "sexy" or "dangerous" objects were B-RED. The pictures of objects chosen for the experiment are listed in Table 3, along with the number of hits with *piros* and *vörös* in the HNC. The exact pictures of objects can be found in Appendix C.

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[9] http://openclipart.org
[10] Some modifications were also made for some of the pictures to better fit the experiment, such as removing distracting elements in the background.
[11] http://gimp.org

Table 3. **Red objects with sexy/dangerous connotations (nr 1-10) and neutral/positive connotations (nr 11-20) and their number of hits in the HNC**

	English word	Hungarian word	Hits in HNC with *vörös*	Hits in HNC with *piros*
1	Flag	Zászló	1030	654
2	Lips	Ajak	38	50
3	Star	Csillag	2078	44
4	Devil	Ördög	853	6
5	Fire	Tűz	29	19
6	Eye	Szem	248	168
7	Dress	Ruha	130	233
8	Shoe	Cipő	10	105
9	Blood	Vér	42	157
10	Dinosaur	Dinoszaurusz	0	0
11	Heart	Szív	26	123
12	Tomato	Paradicsom	3	51
13	Rose	Rózsa	473	305
14	Car	Kocsi	4	78
15	Book	Könyv	154	64
16	Apple	Alma	2	309
17	Carpet	Szőnyeg	1747	134
18	Light/lamp	Lámpa	56	1710
19	Bell pepper	Paprika	11	250
20	Teddybear	Mackó	0	11

4.3 Participants

The participants were recruited in Budapest, Hungary. The youngest participant was 21 years old and the oldest 51 years old. The mean age for females was 30, and the mean age for males was 28. 15 out of the 30 participants were men. The participants were recruited by the help of friends and family members of mine living in Budapest, who asked people in their surroundings (work place, university, shopping places they frequented etc) if they would like to participate in a short thesis experiment.

All participants filled out a form of informed consent (Appendix B), as well a short questionnaire (Appendix A) with age, gender, information on potential colour blindness, what language was their L1, what other languages they spoke and what dialects they had. None of the participants reported having any kind of colour blindness.

4.4 Procedure

The experiment was performed as a communicative referential game, in which the participant was supposed to describe a picture for the experiment leader. Since it was impossible to known in advance how many participants would be recruited for the experiment, Test A and Test B were counterbalanced, so that participant 1 did Test A, participant 2 did Test B, and then participant 3 did Test A, and so on. The experiment leader had a paper with all the pictures as miniatures, and would checkmark the pictures on the paper as the experiment proceeded. This referential game was used to make sure the participants as much as possible mentioned the colour in the picture. In the beginning of each individual test, the participant was given four pictures with an example of how to describe a picture, so that they would feel comfortable in the task. The examples consisted of simple noun phrases, such as "a blue fox", while showing a picture of a blue fox. The experiment leader was in all cases identical with the author of this thesis, and the participants were aware that I spoke limited Hungarian. My limited Hungarian could have affected the outcome of the studies, but this lack of communication skills in Hungarian from my part was compensated partly by most of the time being accompanied by a relative who interpreted for me, and partly by the fact that the whole experiment had written instructions in Hungarian. Furthermore, many of the participants had somewhat good knowledge of English. In one case I had to communicate in German with a participant.

In the end of the experiment, the participants were asked three debriefing questions. These were as follows: "Did you find the test difficult?", "Was anything unclear?", and "Can you guess what the purpose of the test was?". In those cases where the participants were familiar with English, the questions were directly asked by the experiment leader in English, and with monolingual speakers the questions were translated by a third person.

4.5 Results

There were less than a handful of cases during the experiment were participants first said either *piros* or *vörös* and then switched to the other colour term immediately, correcting themselves. In these cases, the second choice is the one counted as the one intended, and thus used in the results. The same thing happened a few times with the distracter pictures, indicating that it has to do with a "slip of the tongue". Table 4 below shows the proportions of responses of both colour terms for each object with the two different shades of red, combining the data from Test A and Test B.

Table 4. Results table, Study 2. Responses of vörös and piros for each category and colour indicated in percentage.

| Colour:	Light red		Dark red	
Responses:	Piros	Vörös	Piros	Vörös
Flag	80	20	80	20
Lips	73	13	80	13
Star	47	47	47	53
Devil	60	40	47	40
Fire	47	13	60	13
Eye	80	20	67	33
Dress	100	0	60	33
Shoe	93	0	80	13
Blood	33	7	60	20
Dinosaur	80	20	67	27
All dangerous	**80**	**20**	**71**	**29**
Heart	93	7	87	0
Tomato	80	0	67	0
Rose	40	60	47	47
Car	100	0	93	7
Bok	100	0	93	7
Apple	100	0	80	13
Carpet	100	0	87	13
Light/lamp	100	0	80	20
Bell pepper	87	0	80	0
Teddybear	93	7	87	13
All neutral	**92**	**8**	**88**	**12**

The term *vörös* was used by all except for eight participants. Interestingly, six of these participated in Test B, which means that they did not see any picture of an object that was *both* D-RED *and* belonged to the dangerous category (all dangerous category objects occurred only with D-RED in Test A). This is a first indication that the colour shade *and* semantic dangerous connotation *in combination* may have contributed to the use of *vörös*.

The results of the experiment showed a broad distribution of *vörös*. There were no signs of idiomatization, since all objects but two (*paradicsom* ('tomato') and *paprika* ('bell pepper') were modified with both *piros* and *vörös*, and these two objects both occurred with *vörös* in the HNC. There were also no occurrences of *sötétpiros* (sötét = dark) anywhere in the data, which was unexpected, considering that 50% of the red objects in the pictures were D-RED and *sötétpiros* occurred frequently in previous corpus and frequency studies (see 2.3).

Another thing that was unexpected, was that *sötétvörös* occurred in the experiment, though this only happened once, as a modifier to the D-RED teddy bear. This particular case is counted as a *vörös* in the results.

When it comes to the use of *vörös*, as mentioned previously the data shows no tendency towards idiomatization. Rather, *piros* and *vörös* were interchangeable and the choice was dependent on two factors: shade and connotation.

As seen in Figure 4 (corresponding to the total amount of *vörös* responses in Table 4), the overall percentages show that there were relatively many *vörös* responses for objects displayed with a dark shade of red compared to objects displayed with a light shade of red. The same difference is noted with the objects that belong to the passionate/dangerous category compared to the neutral category.[12] As seen in Figure 4, the highest percentage of *vörös* responses was for objects that were *both* dark *and* dangerous.
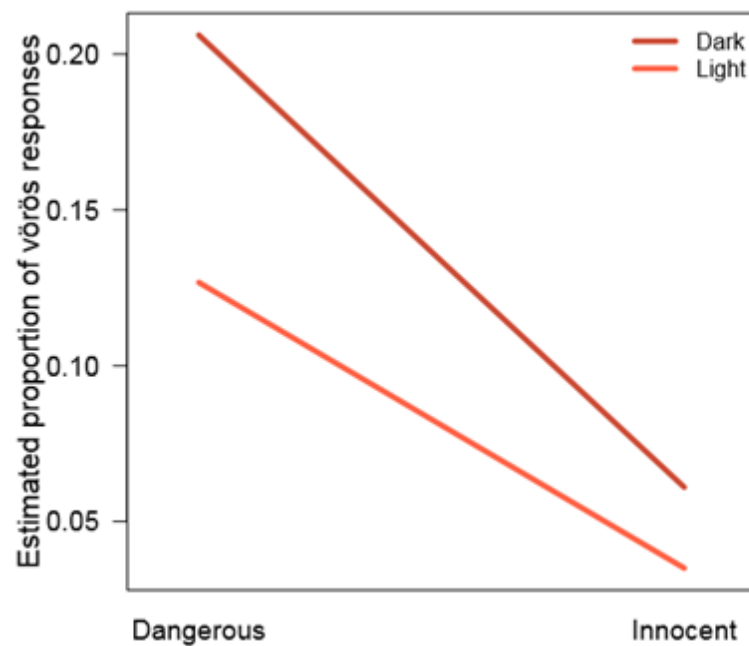
Figure 4. *Vörös* responses in proportion to connotation and colour shade.

Figures 5 and 6 show the proportions of responses for the red objects from each category and in each colour shade. The *vörös* responses are seemingly higher in the *sexy/dangerous*

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[12] These main effects of object category and colour were statistically significant. However, the interaction of the two was not.

category than in the *neutral* category. This indicates that the colour term is used when the object painted in red has certain emotional connotations for the speaker.

Several participants mentioned in the debriefing discussions after the experiment that they would use *vörös* for a red dress if they consider the dress to be sexy or provocative, and *piros* if it is just a neutral dress, indicating that the participants consider the difference between the two terms to be mainly in connotation. However, the picture with the woman in a red dress was modified solely with *piros* when it was shown in the lighter red colour, but modified with *vörös* about a third (33%) of the times when it was dark red, indicating that it is indeed also a colour shade influence on the colour term choice.

Furthermore, if we look closer at some of the pictured objects in the neutral category, there is a tendency that *vörös* is used if the object is in a darker red shade. The most prominent results for this are found in the columns for *car*, *books*, and *apple*, where there were a 100% *piros* response when the pictured object was light red, but not when it was dark red.
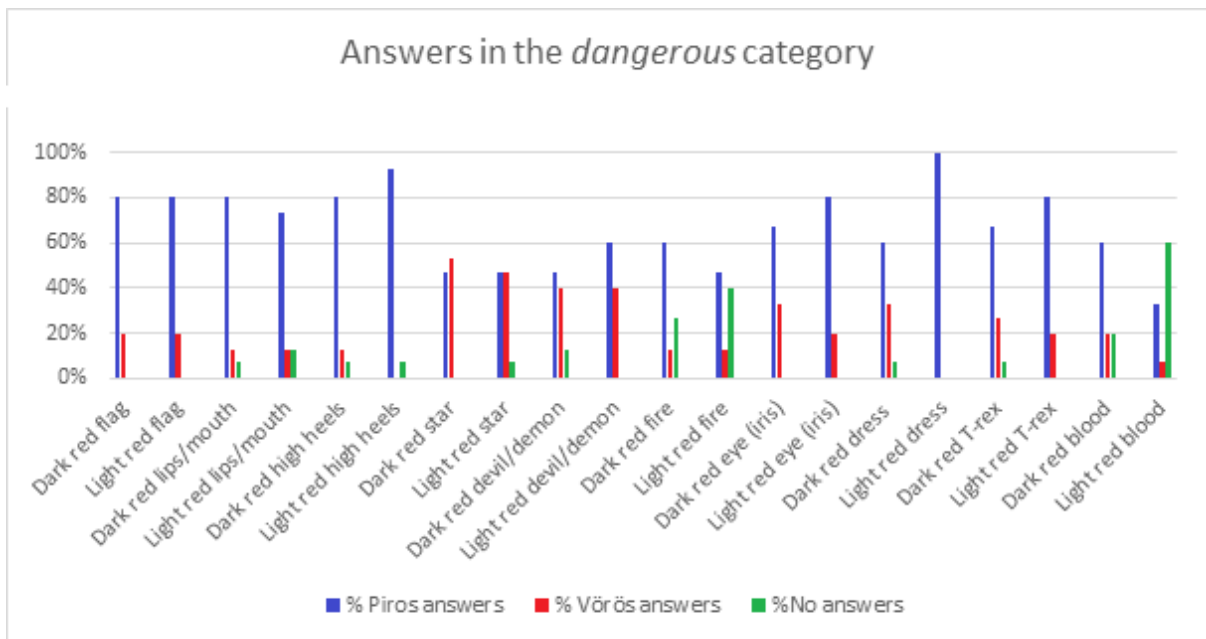
Figure 5. Answers (%) in the *dark/dangerous* connotations category.
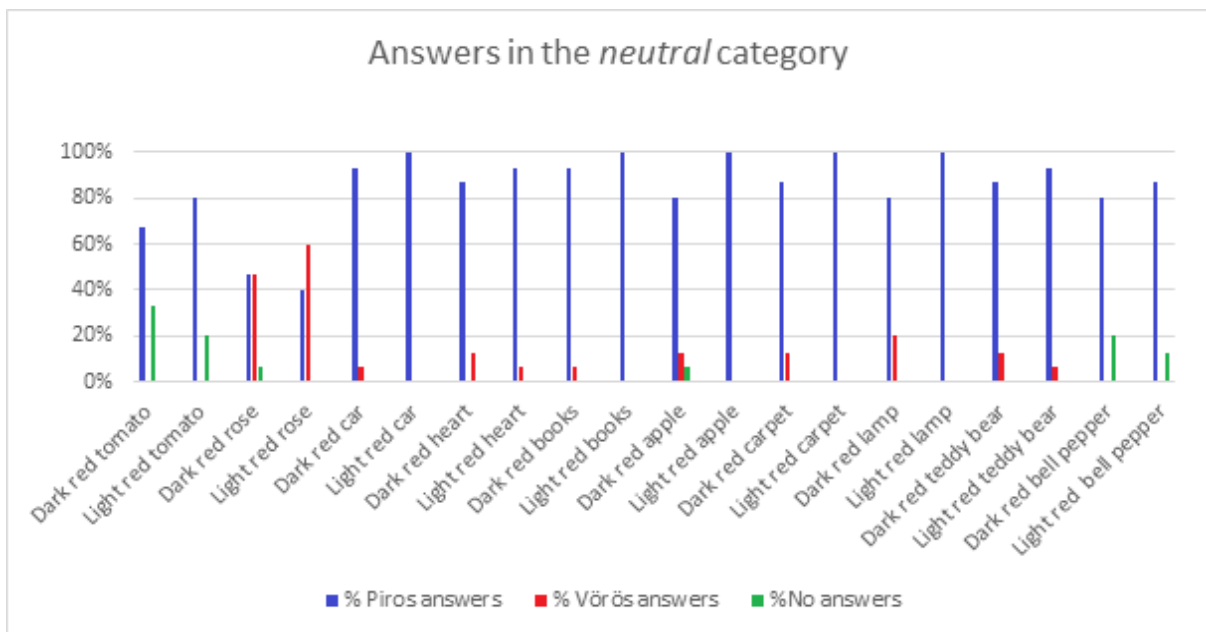
Figure 6. Answers (%) in the *neutral* connotations category.

Interestingly, two of the participants who never used *vörös* said after debriefing that they did not use *vörös* during the test because it was "only drawn pictures" and therefore "did not provoke any feelings". One participant said she did not like to use the term *vörös* because the term is "too dramatic".

All participants reported during debriefing that they could not guess the purpose of the test. Most of the participants either did not guess at all, claiming they had "no idea what this was for", or they guessed that the test was about Hungarian grammar. Some claimed that they assumed the test was about grammar since the examples in the beginning had the accusative suffix attached. The fact that no one could correctly guess the purpose of the experiment is regarded as evidence that the distracter pictures with objects in colours other than red worked (with a little help from the accusative suffix), and that the participants were not focusing their attention on whether to use *piros* or *vörös* during the test. Furthermore, during discussions with participants after debriefing, several mentioned the colour *bordó* as another common colour term for darker/blue-ish red.

4.6 Discussion

The results support both of the relevant hypotheses:

- Hypothesis 2: The use of *vörös* will be in part predicted by the shade , and in part by the category of the object (dangerous, non-dangerous).
- Hypothesis 3: The meaning of *vörös* is productive, i.e. can be applied to novel objects, based on its denotational or connotational senses, or both.

Certain phrases, such as *vörös csillag* ('red star') may seem to be idiomaticed since *star* often is described with the modifier *vörös*. However, the use of *piros* in the same phrase points towards this not being a matter of idiomatization, but rather a matter of *connotation*. Since a red star is connected to either violence (bloody/violent occupation) or passion (revolt) the use of *vörös* as a modifier can be expected to increase. If the star is considered more neutral in a specific context, the preferred modifier is *piros*. The choice of colour term is, in other words, up to the speaker to make, seemingly based on emotions. This is supported by the input from native speakers, claiming that the term *vörös* is dramatic. The lack of *vörös* as a modifier to the red tomato and paprika can be explained with the same reasoning: a tomato or paprika is seldom considered as passionate or violent, and would therefore rather be modified with *piros*. The picture of a woman in a red dress points towards both semantic connotation *and* colour shade being the reason for choice of colour term. Participants claimed that they would

use *vörös* if they consider a dress to be provocative or sexy, but the data shows that *vörös* was only used when the dress was also in the darker shade of red.

Furthermore, during discussions with participants after debriefing, several mentioned the colour *bordó* as another common colour term for darker/blue-ish red. This could indicate that Uuskula & Sutrop (2007) (among others) might have been wrong in not including *bordó* when listing Hungarian BCTs. Unfortunately, there were no blue-ish red pictures in the experiment, so any hypothesis about *bordó* being a BCT is left for future research.

4.7 Summary

The results of the study described in this chapter show that *piros* and *vörös* are interchangeable, and none of them can be said to form part of only idiomatic expressions. Despite much inter-individual variation, a few clear patterns could be established. While *piros* was clearly more frequent in general, *vörös* tended to be used when the object to be described either belongs to the D-RED category, or when it can be associated with "dangerous" semantic connotations, such as passion or violence.

In general, the results can be seen as confirming all three hypotheses formulated in Chapter 3, and repeated at beginning of this chapter. However, we still need to address the issue of intersubjective validity of semantic connotations in question.

5. Intersubjective agreement for the "dangerous" category (Study 3)

5.1 Introduction

A final study was conducted to test whether the pictures of objects chosen represent the "sexy/dangerous" connotation category on the basis of the author's intuitions, were in fact considered as such by Hungarian speakers in general. Otherwise, it could be argued that the intuition-based analysis lacks in intersubjective validity, as it is a mere product of the introspections of the author. [13]

First, it needs to be clarified how the categories in Study 2 were assumed by the author. Not much needs to be said for the *neutral/innocent* or *non-dangerous* category: a tomato, carpet, lamp, bell pepper or a random book is seldom considered dangerous, passionate or provocative, unless we are talking about, for example, a book about sex or politics.

 The dangerous category, however, needs some explanation on which part of "*dangerousness*" the objects were assumed to belong to, and why. The *red flag* and the *red star* were assumed to belong to an either dangerous (occupation, war, death) or passionate (revolt, idealism) context, and should evoke these connotations with the Hungarian speakers. *Red lips*, red *high heeled shoes*, and red *miniskirts/short dresses* are usually presumed to be connected to sexiness, passion, and/or being provocative. *Fire* and *blood* have more naturally dangerous connotations, with fire being uncontrollable and dangerous, and spilled blood is to a certain degree life-threatening. *Dinosaur* is not as natural for human beings, except for the cultural context in which we see T-rex's on screen devouring people. This particular picture was of a red T-rex with a poor human being in the mouth, which was assumed to evoke even more danger connotations. The *eye* had the iris coloured red, which is the mainstream assumption of how the eyes of evil and dangerous blood thirsty vampires would look like. The *devil* has, of course, evil connotations.

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[13] In the difference between (intersubjective) intuition and private introspection as methods of analysis, see Itkonen (2008) and Zlatev (2010)
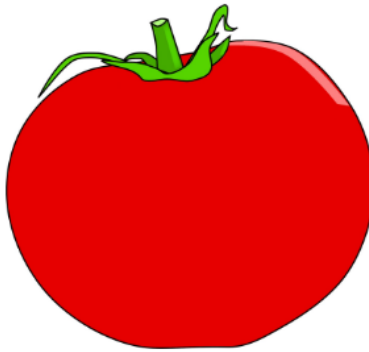
5.2 Method

The test was formulated as a questionnaire made in Google Forms, which was spread through social media, mainly via Facebook. The 20 red pictures from Study 2 described in the previous chapter were shown and the participants were asked to categorize the objects in one (and only one) of four categories, translated into English as follows:

- Innocent and/or cute (hu: Ártatlan és/vagy aranyos)
- Neutral (hu: Semleges)
- Passionate and/or erotic (hu: Szenvedélyes és/vagy erotikus)
- Violent and/or evil (hu: Erőszakos és/vagy gonosz)

The question (again, translated into English from the original Hungarian) was: "How would you describe an object like this?" An example from the test is shown in Figure 7. The first two categories were meant to reflect the class of "neutral" objects, while the third and fourth replies were meant to indicate a "sexy" or "dangerous" object.

The pictured objects were the same as those used in Study 2, and hence the pictures can be found in Appendix C. However, the 20 pictures were shown in a shade of RED in between the two shades used in Study 2 (RGB 235.0.0.), to avoid having the darkness of colour shade influence the results. The questionnaire was in Hungarian, to make sure, as much as possible, that only speakers of Hungarian would answer it. At the end of the questionnaire there were a few questions regarding the participant's age, gender, and native language.
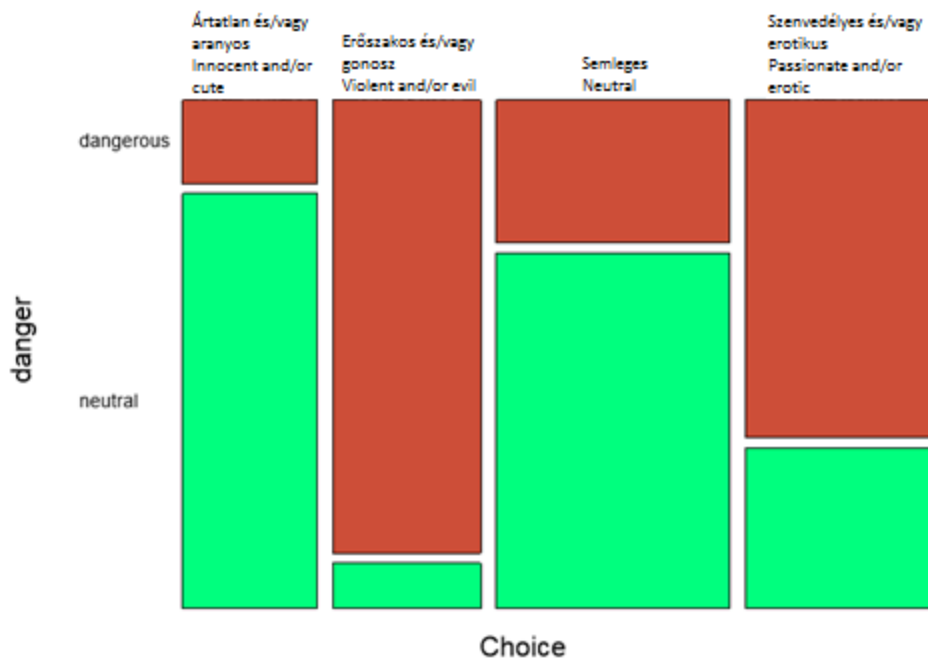
Figure 7. An example from the questionnaire (Study 3).

The Hungarian words were chosen after careful consideration (and after discussions with native speakers of Hungarian). For instance, the word *gonosz* was chosen because it means EVIL, as in "evil with the intention of being evil". I could have used another word that also denotes EVIL, *rossz*, but this word has the same connotations as the English word *bad*, i.e. not necessarily *intentional* evil. Therefore, *gonosz* was considered a better choice for this test.

5.3 Results

85 participants answered the questionnaire. 70% of these reported being women. 83% said they lived in Hungary, and 100% said that Hungarian was their native language. The youngest participant reported being 13 years old and the oldest 69 years old. The mean age was 36.

The results of Study 3 confirmed my choice of objects for the *sexy/dangerous* category. As seen in Figure 8, the pictured objects assumed to belong to this category on the basis of fairly general intuitions were most often categorized as being passionate/erotic or violent/evil. The objects assumed to belong to the neutral/positive category were most often categorized as being neutral or innocent/cute.

Figure 8. Results from the questionnaire (Study 3). The width of columns indicate frequency. The colours show what choice was made for each presumed category (named above). Green shows a neutral/innocent choice, and red shows a passionate/erotic or violent/evil choice.

One surprising result was that the ROSE was categorized as passionate and/or erotic by 77%, whereas it was assumed by me to belong to the neutral category. However, even though this shows divergence from my intuitive categorization, this result actually supports the analysis in Study 2, since ROSE got a much higher percentage of *vörös* response than expected. Another surprising result was that about 8% categorized the TOMATO as being passionate and/or erotic, which only shows that judgements are always in part subjective.

5.4 Summary

The study described in this chapter was carried out in order to forestall criticism that the results from Study 2, i.e. the main study for this thesis, could have been spurious as far as semantic connotations of *vörös* are concerned, as the objects used in that study were categorized as "dangerous" or not on the basis of my intuitions. The fact that naïve speakers of Hungarian largely confirmed this categorization (which exceptions pointed out) showed that the intuition-based analysis in Study 2 was not just based on "private introspection", but largely corresponded to intersubjectively shared categories for a rather diverse sample of Hungarian speakers.

6. General discussion

The empirical studies described in the previous three sections allow us to address the main research questions, formulated in Chapter 1 as follows:

- What is the semantic difference between *vörös* and *piros*?
- Does *vörös* function as a basic colour term (BCT) in Hungarian?
- What kind of implications does this have for the debate between universalism and relativity in colour semantics?

Firstly, we can exclude the possibility that *vörös* only occurs in idiomatic expressions – *it is clearly a colour term*, which can be used to denote the colour category RED on both familiar objects (like a teddy bear) and less common ones (like a dinosaur) object. However, as shown in Study 1 (Chapter 3) and Study 2 (Chapter 4) in many cases it applies to the same colour shades and the same objects as *piros*. While there is a clear tendency towards *vörös* mostly being used with darker shades it can also be used for lighter shades of red, just as *piros* can be used for darker shades of red, with or without modifiers such as *sötét* (dark) or *világos* (light). Hence, while there appears to be a difference in terms of denotation, this is not consistent and mutually exclusive enough to motivate the claim that Hungarian has two colour categories: D-RED and L-RED, at least without more research of the kind that motivated Winawer et al. (2007) to claim that Russian has two different categories of BLUE.

Rather, the clearest difference in the senses of *piros* and *vörös* concerns connotations – the associations with "violence", "passion" and "dangerousness" of the latter, that where shown both in the quantitative data from Studies 2 and 3, and the qualitative statements from the participants during the debriefings (see Section 4.4).

Where does this lead us with respect to the second question? First, *vörös* conforms to the standard criteria for BCT status (see Section 2.3). Further, it clearly cannot be excluded by claiming a high degree of idiomatization, as shown in the results from Study 2. Third, its semantic connotations are not "included" in *piros*, despite the higher frequency of the latter. *Vörös* can, in other words, not be said to be "a kind of *piros*", as proposed by Berlin and Kay (1969). In sum, *vörös* fulfils all of Berlin & Kay's criteria for being a BCT: it is clearly monolexemic, at least a part of its signification (the connotational) is not included in another

colour term, it is not restricted to certain objects, and it is salient among speakers. Hence, we can answer the second question affirmatively. It should be noted that this is not contradicted by the fact that *piros* was used more frequently than *vörös*, since not all BCTs are equally frequent. When it comes to frequency in HNC for instance, *vörös* ends up on the 7th place when put on a list together with the 12 BCTs assumed by Berlin and Kay (See Section 2.3 and Papp, 2009).

The relatively low frequency of *vörös* could indicate that it is "losing ground" to another colour term: *bordó*, which is consistent with the high frequency of *bordó* found in Study 1 (Chapter 3). However, if this were so, *bordó* would have appeared more often in Study 2 with the dark red pictured objects, which was not the case. One explanation could be that *vörös* used to denote a bluer shade of red (as Csapodi proposed in the late 1890's), and therefore *bordó* is on the way to fill that semantic gap. This would explain the high overlap between *vörös* and *bordó* in the bluer shades of RED in Study 1.

Consequently, Hungarian may even have not only two but *three basic colour terms* for RED, which would clearly be troublesome for the universalist semantic theory of Berlin and Kay (1969). Former studies have either dismissed *bordó* as a BCT, or simply not mentioned *bordó* at all, even though the term seems to be salient among native speakers. Study 1 (Chapter 3), as well as the many debriefing discussions with participants in Study 2 (Chapter 4), suggests that this might have been a mistake, possibly caused by too much focus on *piros* and *vörös* within the BCT debate. Uuskula and Sutrop (2007), for instance, claim that *bordó* is not a BCT because it obviously is a recent loan word (criterion vii) meaning "Bordeaux" (as the wine-region). However, according to Berlin and Kay's BCT criteria, recent loan words are only suspect if they do not fulfil the original four criteria. Furthermore, the colour term has been in use in Hungary since the late 1800's, suggesting that *recent loan* no longer should apply to the term. If *bordó* would turn out to fulfil the original four BCT criteria, it should probably indeed be considered a BCT. If this is the case, Hungarian has three BCTs for RED, and one of them (*bordó*) is possibly filling out the semantic gap of another (*vörös*).

Since *bordó* was not the focus on this thesis, however, none of the RGB colours used in Study 2 belonged to the bluer shades. If I would have known in advance that so many of the participants would mention *bordó* after debriefing, I might have added RGB 200.0.50 or 160.0.0. to Study 2, to also check for the use of *bordó*. As this could be important evidence

for an anti-universalist position in colour semantics, and possibly also colour-cognition, is clearly something to have in mind for future studies.

7. Conclusions

This thesis has focused on the semantics of the Hungarian colour terms for the category(s) RED *piros* and *vörös.* We placed this investigation within the context of the debate between universalism (e.g. Berlin & Kay 1969) and relativism (e.g. Winawer et al. 2007) in colour semantics and – even more controversially - colour cognition.

In the studies described in Chapters 3-4, the "problematic" term *vörös* was found to fulfil all criteria for being a basic colour term (BCT), and should be considered as such in Hungarian. However, one crucial point was found to be missing in the original criteria: the *connotations* of a colour term which can, as has been shown in the case of *vörös*, be an important aspect of the meaning/sense of the term. Study 2, corroborated by Study 3 (Chapter 5) showed that concerning *vörös* and *piros*, the former has "dark" connotations such as violence, evil, or passion, whereas the latter is neutral or has connotations of being innocent or cute. Simply assuming that a colour term only denotes a certain colour shade, might lead to mistakes such as claiming a colour term being idiomatized, even when this clearly is not the case.

The three hypotheses formulated in Section 2.5 were confirmed by the three studies (Chapters 3-5). In sum, *vörös* functions as a basic colour term, generally (but not always) denoting a darker shade of RED than *piros*, and the two terms differ in connotations. It can be used productively with a variety of objects, and is hence not "bleached" or "idiomatized".

However, since the difference in meaning between *vörös* and *piros* was not purely denotational, and as clear as that between the Russian terms *siniy* and *goluboy* (e.g. Winawer et al. 2007), we cannot at this point postulate two different colour categories for Hungarian: D-RED and L-RED. The results of this thesis therefore at require us to be agnostic concerning the debate whether colour categories are universal or not. Hungarian arguably has more than one BCT for the category RED, but whether this means Hungarians also have different colour categories than English speakers, is left for future research.

Throughout the work with this thesis, one colour term came back repeatedly, which leads to a need for further research: namely the colour term *bordó*. The term has been dismissed by researchers in considering BCTs because it is a loan word, and other researchers simply did not take the term into account at all while looking at BCTs. This however, I believe might be a mistake simply based on assumption that an obvious loan word cannot be a BCT (which of course it can be, see e.g. *orange* in Swedish), and perhaps also a mistake deriving from the

debate of *piros* and *vörös* taking up so much space when it comes to RED. While *bordó* was not the focus of this thesis, based on the high amount of *bordó* in Study 1, future research into the basicness of *bordó* would be motivated.

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Appendix A

TEST   A   B   no _____

What is your age? _____

Are you male or female? _____

Is Hungarian your first language?   Yes ☐

                                          No ☐ *

* <u>If no,</u> what is your first language? _____

What dialect of Hungarian do you speak? _____

What other languages do you speak? _____

Do you suffer from colour blindness?   Yes ☐ *

                                         No ☐

*If so, to what degree? _____

Would you like to have the results of the thesis sent to you? If yes, write your e-mail below.

_____

Thanks for participating ☺

TESZT   A   B   no _____

Hány éves vagy? _____

Férfi vagy nő vagy? _____

Magyar az anyanyelved?   Igen ☐

                                Nem ☐   *

* <u>Ha nem</u>, akkor mi az anyanyelved? _____

Van valamilyen Magyar dialektusod? _____

Milyen egyéb nyelveken beszélsz még? _____

Van-e színvakságod?   Igen ☐   *

                             Nem ☐

*Ha igen, milyen fokú? _____

Szeretnéd megkapni a teszt eredményét? Ha igen, akkor add meg az e-mail címedet:

_____

Köszönet a résztvételért! ☺

Appendix B

Informed consent form

I hereby consent to participating in a study in colour semantics, from Lund University, Sweden.

By signing this document, I agree to describe pictures with different coloured objects and answer some other brief questions regarding the pictures. The whole test will be sound recorded.

I am aware that my participation is voluntary and that I can quit the test any time without having to give an explanation.

- I am informed that the results will be completely anonymous.
- I understand that the results will be presented at conferences and/or be published, without the identities of the participants being revealed.
- I have been given enough information before the test is done and I will have an opportunity to ask questions regarding the test.

This consent form will be signed in duplicate, one for me to keep and one for project documentation.

Place and date _____

Signature _____

For more information, please contact:

Jessica Presits jessica.presits.437@student.lu.se

Tájékoztató beleegyezö nyilatkozat

Beleegyezem abba, hogy részt vegyek a Lund Egyetem (Svédország) színes szemantika területén végzett kutatásában.

Jelen dokumentum aláírásával beleegyezem, hogy különbözö színes tárgyakat kell leírnom, és néhány kérdésre válaszolnom a képekkel kapcsolatban.

Tudomásul veszem, hogy a részvételem önkéntes, és bármikor kiléphetek a tesztböl különösebb magyarázat nélkül.

- Tájékoztatva lettem arról, hogy a válaszaim anonim módon lesznek kezelve.
- Beleegyezem, hogy az eredmények konferenciän publikálva lesznek anélkül, hogy a az eredményekböl vissza lehetne következtetni az egyéni válaszadókra.
- Elég információt kaptam a teszt megkezdése elött, és tudom, hogy van lehetöségem kérdezni.

Ez a beleegyezö nyilatkozat duplán lesz aláírva, amelyböl egyet én kapok meg, egy pedig a projekt dokumentálására lesz eltéve.
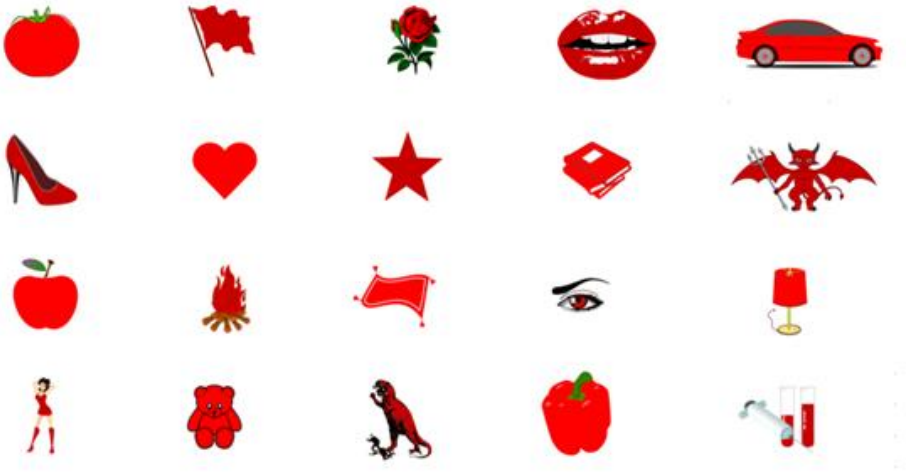
Hely és dátum _____

Aláírás_____
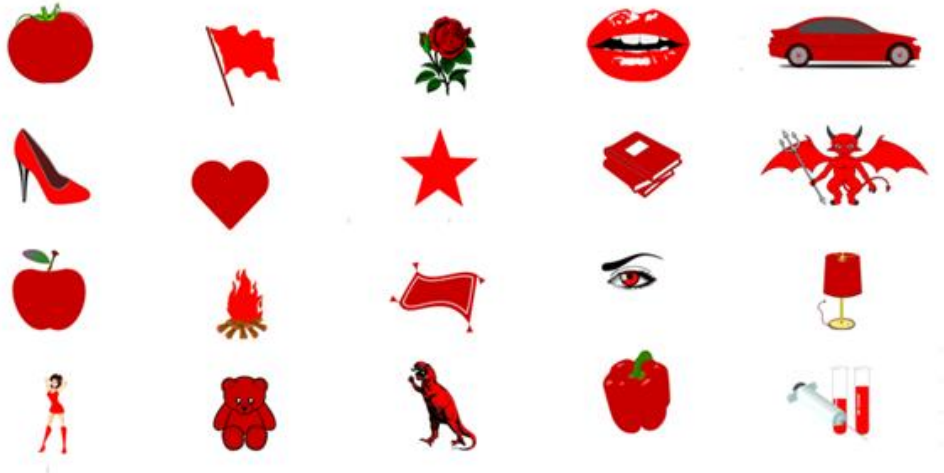
További információ a következö elérhetöségen kérhetö:

Jessica Presits jessica.presits.437@student.lu.se

Appendix C

The red pictured objects used in Study 2, Test A.

The red pictured objects used in Study 2, Test B.

Appendix D

Table 1

Informant		255.00.00	240.00.00	230.00.00	210.00.00	200.00.00	180.00.00	160.00.00	140.00.00
A	Test 1 - 38 year old female	Piros 3	Piros 7	Piros 1	Piros 2	Vörös 17	Bordó/Barna? 25	Bordó 22	Barna/Bordó 18
B	Test 2 - 34 year old male	Piros 9	Piros 6	Piros 17	Piros 18	Vörös 21	Barna 19	Barna 20	Barna 15
C	Test 3 - 6 year old female	Piros 13	Narancs 14	N.Sárga 30	Piros 7	Bordó 23	Barna 19	Bordó 20	Barna 2
D	Test 1 - 79 year old female	Piros 3	Piros 25	Vörös 8	Piros 24	Piros 5	Bordó 25	Bordó 9	Bordó 14
E	Test 2 - 55 year old male	Sötétpiros 13	Vörös 19	Piros 1	Sötétpiros 17	Sötétnarancs 32	Sötétpiros 19	Sötétpiros 6	Barna 31
F	Test 3 - 17 year old female	Piros 3	Piros 29	Világospiros 8	Piros 24	Vörös 23	Vörös 25	Vörös 9	Barna 18
G	Test 1 - 37 year old male	Piros 3	Piros 19	Piros 2	Vörös 18	Vörös 21	Vörös 20	Vörös 4	Sötétbarna 25
H	Test 2 - 30 year old male	Narancs 8	Piros 30	Piros 24	Piros 17	Vörös 16	Vörös 20	Bordó 25	Bordó 30

Table 2

Informant		255.60.00	255.50.00	255.40.00	230.50.00	255.00.50	230.00.50	200.00.50	180.00.60
A	Test 1 - 38 year old female	Narancs 31	Piros 12	Piros 15	Piros 16	Piros 10	Piros 8	Bordó 13	Bordó 11
B	Test 2 - 34 year old male	Narancs 8	Piros 11	Piros 14	Piros 12	Piros 7	Vörös 24	Bordó 23	Lilaspiros 27
C	Test 3 - 6 year old female	Narancs 15	Narancs 24	Narancspiros 4	Narancs 30	?Piros 23	Sötétrózsaszín 26	Bordó 5	Barnavörös 10
D	Test 1 - 79 year old female	Piros 31	Piros 11	Világospiros 15	Világospiros 20	Piros 10	Sötétpiros 32	Bordó 13	Sötétrózsaszín 26
E	Test 2 - 55 year old male	Narancs 24	Narancs 28	Narancs 14	Narancs 31	Piros 26	Sötétpiros 24	Sötétpiros 29	Sötétbordó 5
F	Test 3 - 17 year old female	N.Sárga 6	N.Sárga 12	N.Sárga 27	Piros 20	Rózsaszín 28	Vörös 8	Vörös 13	Bordó 11
G	Test 1 - 37 year old male	Piros 8	Piros 27	Piros 15	Piros 19	Piros 10	Vörös 32	Vörös 13	Bordó 26
H	Test 2 - 30 year old male	Narancs 22	Narancs 28	Narancs 31	Narancs 32	Rózsaszín 26	Piros/Vörös 24	Vörös 13	Lila 27

Appendix E

Table 2. The colour terms distribution in Study 1.

RGB value	255.0.0.	240.0.0.	230.0.0.	210.0.0.	200.0.0.	180.0.0.	160.0.0.	140.0.0.
Colour								
Piros	13/16	10/16	13/16	10/16	4/16			
Világospiros			1/16					
Sötétpiros	1/16	1/16		1/16	1/16	1/16	1/16	
Lilaspiros								
Narancspiros								
Vörös	1/16	2/16	1/16	4/16	7/16	7/16	3/16	1/16
Barnasvörös								
Bordó				1/16	1/16	5/16	8/16	6/16
Sötétbordó							1/16	
Barna					1/16	3/16	3/16	7/16
Sötétbarna								2/16
Narancs(sárga)	1/16	3/16						
Sötétnarancs			1/16		2/16			
Okrasárga								

RGB value	255.60.0.	255.50.0.	255.40.0.	230.50.0.	255.0.50.	230.0.50.	200.0.50.	180.0.60.
Colour								
Piros	6/16	6/16	8/16	9/16	14/16	3/16		
Világospiros		1/16	2/16					
Sötétpiros						2/16	2/16	1/16
Lilaspiros								2/16
Narancspiros								
Vörös						7/16	8/16	
Barnasvörös								1/16
Bordó						1/16	6/16	3/16
Sötétbordó								2/16
Barna								
Sötétbarna								
Narancs(sárga)	10/16	9/16	6/16	4/16				
Sötétnarancs				2/16				
Okrasárga				1/16				
Lila								4/16
Bibor								1/16
Rózsaszín					2/16			
Sötétrózsaszín							2/16	2/16
Terracotta						1/16		