Color Language and Color Categorization

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Edited by

Geda Paulsen, Mari Uusküla
and Jonathan Brindle

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PREFACE

From June 4 to 7 2013, linguists, psycholinguists, psychologists and cultural anthropologists from several countries met in Tallinn at the *Colour Language and Colour Categorization Conference* (CLCC) to exchange ideas on several topics of color categorization and color linguistics. The CLCC conference was organized by the editors Mari Uusküla and Geda Paulsen at the Institute of the Estonian Language, Tallinn.

The main aim of the conference was to draw together scientists working with the concept of color across the globe to share and enhance the future growth of color research. The topics included color categorization in diverse languages, color cognition, corpus linguistic studies, diachronic studies of color language and change, and bilingualism and color categorization in the human mind and brain. As no event could ever be possible without its participants we owe our gratitude to our conference keynote speakers Guy Deutscher, Guillaume Thierry, Galina Paramei and Alexander Borg. We would also like to thank our colleagues Urmas Sutrop and Liivi Hollman who acted as organizing committee members, and we must also mention the team of graduate and undergraduate students and others who helped us during the CLCC conference. After the conference some participants refused to leave Tallinn unless the organizers promised at least to consider publishing a book based on the presentations given at the conference. For the idea of putting such a book together we owe our gratitude to Seval Kömürcü and Rachael Hamilton.

We are indebted to all our reviewers who helped the editors to decide on the content of the book and helped our authors to improve their chapters: Erik Andersson (Åbo Akademi University, Finland), Signe Rix Berthelin (NTNU, Norway), David Bimler (Massey University, New Zealand), Anthony G. Greenwald (University of Washington, USA), Kaisa Häkkinen (University of Turku, Finland), Ivar Jung (Linnaeus University, Sweden), Reet Hendrikson (Estonian National Defence College), Marja Kallasmaa (Institute of the Estonian Language, Tallinn, Estonia), Gerson Klumpp (University of Tartu, Estonia), Carsten Levisen (Roskilde University, Denmark), Dimitris Mylonas (University College London, UK), Tony Naden (Ghana Institute of Linguistics, Literacy and Bible Translation, Ghana), Susanne Niemeier (Universität Koblenz-Landau,

Geda Paulsen, Mari Uusküla, Jonathan Allen Brindle
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INTRODUCTION

Color categories and the role of language in color discrimination have attracted the attention of numerous scholars in recent decades. The latest research in color categorization has focused on the mechanisms that are at the core of perceptional distinctions in natural languages. This volume addresses the question of how colors are categorized and encoded across different languages and cultures. It is divided into four parts: the expression of basic color categories; the linguistic semantics of color words; the cultural representation of color; and the extension of color meaning. This book of peer-reviewed chapters answers questions such as: How is color conceptualized through language? What kind of linguistic mechanisms do languages tend to use to describe a color? Which factors bias color language? What methods could be used to understand human color categorization and language better? How do color vocabularies evolve? How does context impact color cognition?

As the concept of color is explored through the prism of, mainly, linguistics, the book presents cross-linguistic data from languages spoken in different parts of the world by different people of diverse societies, from traditional semi-nomadic reindeer hunters and self-sufficient hoe-farmers to western fashion enthusiasts. The languages examined in this book include Japanese, Chakali, Estonian, Finnish, Hungarian, Udmurt, Komi-Zyrian, Nganasan and other Uralic languages, Lithuanian, Latvian, Czech, Russian, Turkish, English, Danish, German, Italian, French, Spanish, Mexican Spanish, and Iberoromance creoles.

In terms of methods and tools, some authors administer to their participants the tasks associated with the influential paradigm established by Berlin & Kay in 1969, some authors use experimental paradigms, other authors analyze historical manuscripts and literary novels, and yet others examine the use of color expressions in large corpora or use formal semantic description. The contributions represent a wide range of analytical positions, offering stimulating and thought-provoking perspectives on color research.

Some chapters discuss color term systems of understudied languages, for instance Sándor Szeverényi's investigation of the color terms in Nganasan (Chapter 5) and Jonathan Brindle's examination of color terms in Chakali (Chapter 4). There are also novel applications of methodological

approaches, such as Jodi Sandford's study applying the Implicit Association Test, initially used in psychological research to survey concept associations (Greenwald, McGhee, and Schwartz 1998), to linguistic categorization and the primary conceptualization of basic color terms in English (Chapter 2). Color language research typically focuses on the category of adjectives, but color words can also be grammatically expressed as verbs or nouns. The study of Japanese by Yurie Okami (Chapter 6) addresses the categorical fluidity of color terms, while Chapter 7 by Geda Paulsen, Urpo Nikanne, and Eszter Papp focuses on color verbs.

The theoretical approaches are tightly bound into the methods for extracting color data and the methodological solutions used to investigate the material, implying a bottom-up approach rather than a theory-driven one. The color conceptualization approaches represented in this volume are the basic color term theory of Berlin and Kay (1969), the typological-evolutionary scale of Kay and Maffi (1999), corpus studies, the Vantage Theory of MacLaury (1997), conceptual semantics (Jackendoff 1997, 2010; Nikanne 2008), cognitive grammar (Langacker 2008), place name research, historical linguistics, ethnolinguistics, the Natural Semantic Metalanguage (Wierzbicka 1990, 2006), and classical graph visualization techniques. The wide spectrum of approaches serves the purpose of a multifaceted treatment of the research subject.

A recurrent solution to the problem of unilateral construing of color categories in the book chapters is a combination of methods. In order to develop cognitive linguistic models of color conceptualization, different types of data should be evaluated. A data-flexible method is essential for combining the linguistic knowledge and referential or perceptual aspects of color categories with color representation in other disciplines. In the present volume, ways of integrating methods are proposed by Mari Uusküla and David Bimler in Chapter 1, Magalie Desgrippes in Chapter 3, Jonathan Brindle in Chapter 4, and Carsten Levisen, Eeva Sippola and Karime Aragón in Chapter 11.

The chapters selected for this volume are organized into four interrelating parts. The chapters of Part I also serve to set the stage for the discussions in the other parts. The paradigm of basic and non-basic color terms, introduced by Berlin and Kay (1969), is paramount in this part. The central questions asked by the authors concentrate on the categorization of colors: How are colors conceptualized and at the same time woven into linguistic expressions? How do languages with different typological and cultural backgrounds relate to the "established" color categories? What kind of factors should be considered when defining boundaries between color categories? Are color categories static or dynamic? How do different

methods, like experimental and corpus-based analyses, reflect the categorical boundaries? The authors of the first part discuss aspects of color categorization, such as linguistic signs, cultural influence, diachronic and synchronic approaches, associations, attitude, gender, and age. They make use of documentation acquired through field methods, results from psycholinguistic tests, and analyses of historical written sources.

This first part of this volume begins with a new approach to the identification of the best color examples in a language, examining the focal colors across eleven languages affiliated to Uralic and Indo-European languages. In Chapter 1, **Mari Uusküla** and **David Bimler** test the Linguistic Relativity Hypothesis (Whorf 1956) and its universalist antithesis (Kay and Regier 2007, Regier and Kay 2009) in the light of a comprehensive dataset gathered from a broad range of languages. The results tend to support the weak version of a linguistic relativity hypothesis.

The next two articles add extralinguistic factors to the discussion of color categorization by treating the effects of attitude, association, age, and gender, the extent of a category, and the denotata of the best example of a category. Chapter 2 is an innovative experimental approach to linguistic categorization and the primary conceptualization of basic color terms in English. To these ends, **Jodi Sandford** applies the Implicit Association Test (IAT) developed by Greenwald, McGhee and Schwartz (1998) and originally used within social psychology to study the strength of concept associations in memory. The author demonstrates that the IAT may be employed to reveal a participant's conceptual default attitude toward a given color category. The analysis reveals the variation of cognitive entrenchment of color relations depending on the specific association.

In Chapter 3, **Magalie Desgrippes** investigates the boundaries of color categories, emphasizing the dynamics of the individual cognitive representation. Inspired by the World Color Survey (Kay, Berlin, Maffi and Merrifield, 2007), Desgrippes analyzes data from an intergenerational study of the category orange in French and German. Taking into account the recent research on bilinguals (e.g. Athanasopoulos 2009, 2011) and MacLaury's Vantage Theory (1997), the author proposes a linear fixed model to specify a relation between age, category size, and the denotata of the best example being inside or outside the named category, special attention is given to the age effect.

The last two chapters of Part I use field methods to investigate two under-described endangered languages. Chapter 4 is an experimental study of the color terms of Chakali, a Grusi language spoken in Ghana. **Jonathan Brindle's** study aims to locate Chakali along the typological

and evolutionary scale of Kay and Maffi (1999), and at the same time to examine the color expressions used in folk definitions and their categorization. The chapter suggests that mixed methods as a means for overcoming methodological limitations are a preferred avenue for describing visual perception terms, especially of undescribed languages. In Chapter 5, **Sándor Szeverényi** proposes a system for the color terms of Nganasan, one of the least documented Uralic languages. The author takes into consideration the philological and etymological analyses of the primary written sources and of recent data collected during fieldwork in Ust-Avam in 2008. As a result, four basic color terms are established and three additional terms are determined as having an ambiguous basic-like status in Nganasan.

Part II of this book is devoted to the semantic, structural and referential properties of color words. While research into color expressions typically concentrates on adjectives, the first two articles consider color words that are also realized as verbs or nouns. Remarkably, color terms can shift category within a language and are able to occur as adjectives and also as verbs or nouns. Chapter 6 develops a discussion about this grammatical fluidity of color terms, a topic that has attracted comparatively little attention. **Yurie Okami** analyzes the syntactic ambiguity of color terms in Japanese and argues that although grammatical realizations and a surface order of color words depend on language-specific factors, their interpretational differences should be reflected rigorously in the syntactic structure. In Chapter 7, **Geda Paulsen, Urpo Nikanne** and **Eszter Papp** examine verbs derived from color adjectives. Estonian, Finnish and Hungarian are phylogenetically related languages in the Uralic language family; their color adjectives are transformed into verbs that can be divided into three situational classes: causatives, inchoatives and statives. The authors give a formal analysis of the lexical conceptual structures of the three eventive types of color verbs and a comparison of the lexical systems of these verbs in the three Uralic languages.

Seval Kömürcü's study in Chapter 8 reveals the newest color vocabulary in English, based on material retrieved from the fashion magazine *View*. The author examines the morphological and semantic aspects that the creators of present-day fashion magazines make use of in their highly differentiated color designations. The morphological properties of English color and color-related terms in fashion discourse are found to be mostly obedient to the morphological constraints of English, but existing color words may be combined or modified in different ways. The linguistic analysis is accompanied by a study of variation in terms of diachronic and gender-based comparison.

Chapter 9 concentrates on dialectal language and the naming sources for color words. **Vilja Oja** notes that in the standard form of many European languages the names for 'yolk' are motivated by a color term 'yellow'. It is essential to consider dialectal language as well, because traditional terms may convey information about earlier conceptualization of color terms. The dialectal names for 'yolk' collected in the 1980s for *Atlas Linguarum Europae* turn out to display a much more variable scale of colors, including yellows, reds and brown shades. Remarkably, the relationship also functions in the opposite direction as color adjectives are sometimes semantically motivated by yolk, such as the Komi-Zyrian basic color term for yellow, *kolkviž*.

Chapter 10 is a unique study of the impact of color semantics in a literary work, A. S. Byatt's Little Black Book of Stories (2003). **Jada Schumacher** uses the colors of the Pantone Matching System to represent each color word in the text and lines the colors into even vertical strips. The resultant works become charts depicting the colors in the exact order they arise in one short story. Study of these charts in relation to the archetypal colors in fairy tales, Byatt's literary criticism, and color theory together illustrate the crucial importance of color words to plot universal meaning in Byatt's storytelling.

Within visual semantic research, there is an increasing acknowledgment that color conceptualization cannot emerge independently of its cultural or environmental surroundings. Both the history of discourse in local speech communities and the speakers' social and cognitive realities influence the meanings of color terms. Part III of this volume consists of a collection of chapters exploring the cultural representation of color semantics. Chapter 11 is an innovative contribution on visual-semantic systems in Iberoromance creoles lexified by Spanish and Portuguese. Inspired by recent developments in visual semantics, postcolonial linguistics, and cognitive creolistics, **Carsten Levisen**, **Eeva Sippola** and **Karime Aragón** aim to provide new evidence about 'color' and visuality from creoles, and to relate these findings to the ongoing, multidisciplinary study of visual meanings across languages, cultures, and epochs. The research promotes the under-explored study of visual-semantic systems in contact languages, by means of a detailed discussion of Iberoromance creole data taken from mostly recent studies. The authors argue for the need to separate the more recent effects on semantic systems caused by globalization from older, traditional visual systems. They also emphasize the need for a neutral metalanguage for comparing visual-semantic systems.

The next two chapters deal with colors from an ethnolinguistic point of view. In Chapter 12, **Karime Aragón** explores the meanings of Mexican Spanish color words using the Natural Semantic Metalanguage developed by Wierzbicka (1990, 2006). In this approach, visual meanings are associated with widespread natural and material prototypes identified in the speaker's cultural and environmental contexts. The results of the ethnolinguistic fieldwork reveal the visual meanings embedded in Mexican Spanish color terms and their prototypes, illustrating the way Oaxacans think and talk about color and account for the specifics of their visual and cultural practices. In Chapter 13, **Kaidi Rätsep** investigates the folk etymological explanations for the use of color words in place names. Using data extracted from the Archive of Estonian dialects and Finno-Ugric languages, the author concludes that the Estonian data match the results of similar studies on Finnish and Swedish, finding that 'black' is more frequently encountered than 'white'. The naming motives depend, according to the author, on the named object and its characteristics.

Fixed expressions with figurative meaning and lexemes with metaphorical meaning are exceptional in that they link language to mind, and also culture to society. The chapters in Part IV address the extension of color meaning. In Chapter 14, **Erling Strudsholm**, **Irene Ronga** and **Carla Bazzanella** present a contrastive analysis of idiomatic expressions involving color words. The authors highlight general color categorization issues, common cognitive trends and specific linguistic and cultural constraints in Danish and Italian. The significance of color words in Danish and Italian idiomatic expressions is analyzed from elicited data (Bazzanella, Salvati, Ronga, 2012) and discussed in relation to the general themes of color cognition and context impact on color expressions. Using data from the *Historical Thesaurus* of the *Oxford English Dictionary* (Kay, Roberts, Samuels, Wotherspoon 2009), **Rachael Hamilton** analyzes phraseological expressions in which the color term blue appears. The Historical Thesaurus does not present words ordered by their alphabetical order but by their semantic meaning, organized as a complex hierarchical system of semantic categories. This allows potential metaphorical links to be identified through lexical overlap between distant thesaurus categories. Along with a corpus study based on the British National Corpus (BNC) and the Corpus of Contemporary American English (COCA), individual examples like *blue blooded* and *blue collar* are discussed in detail.

Finally, this book offers interesting food for cross-cultural thought by providing valuable insights to the study of color language and language categorization.

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ALFE = *Atlas Linguarum Fennicarum. Itämerensuomalainen kieli-kartasto. Läänemeresoome keeleatlas. Ostseefinnischer Sprachatlas. Lingvističeskij atlas pribaltijsko-finskih jazykov.* ALFE 1–3. Editors: Anneli Hänninen, Raimo Jussila, Arvo Laanest, Heikki Leskinen, Helmi Neetar, Vilja Oja, Vladimir Rjagojev (resp. ed., part 3), Seppo Suhonen (resp. ed., part 1), Tuomo Tuomi (Editor-in-chief), Tiit-Rein Viitso (resp. ed., part 2), Nina Zaitseva. (Suomalaisen Kirjallisuuden Seuran Toimituksia 800/1295. Kotimaisten kielten tutkimuskeskuksen julkaisuja 118/159.) Helsinki: Suomalaisen Kirjallisuuden Seura, Kotimaisten kielten tutkimuskeskus 2004–2010.

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Corpora

British National Corpus (BNC), http://corpus.byu.edu/bnc

Corpus of Contemporary American English (COCA), http://corpus.byu.edu/coca/

EDITORS

Geda Paulsen is a senior lexicographer at the Institute of the Estonian Language in Tallinn. She received her Ph.D. from the Åbo Akademi University (Finland) in 2011 with a thesis about causative derivative verbs in Finnish. Her research interests include lexical conceptual semantics, morphosyntax, word formation, pragmatics, contrastive linguistics, and language learning and acquisition. During her assignment as a researcher at the Institute of the Estonian Language in Tallinn and her participation in the Color Group activities at the Institute in 2010–2015, she has concentrated on exploring the lexical conceptual structure of color vocabulary with a special interest in semantics and the syntax of color events.

Mari Uusküla has been an Associate Professor of Translation Studies at Tallinn University since 2014. She gained her Ph.D. in Linguistics (Uralic languages) at the University of Tartu, Estonia, in 2008. During her doctoral studies she also visited the University of Budapest, Hungary, and the University of Florence, Italy. Her research interests include linguistics, lexical semantics, semantic typology, color naming, categorization and perception, field linguistics, and psycholinguistics. She was the leader of the Color Group at the Institute of the Estonian Language in the years 2010–2015. She has studied color in the languages of the Baltic Sea, Central Europe and the Mediterranean, and has published research articles on color semantics and categorization in a range of European languages including Hungarian, Italian, Russian, Finnish, Czech and others.

Previously at the Norwegian University of Science and Technology (NTNU) on a postdoctoral fellowship, **Jonathan A. Brindle** holds a position as Research Affiliate in the Quantitative Lexicology and Variational Linguistics research group at the University of Leuven. His research focuses both on the poorly documented languages of Ghana, particularly the Grusi languages, and on the African heritage embodied in the practice of traditional religions and oral literature. In addition, he is interested in registers and argots, on which documentation remains scarce. His personal interest in color categorization emerged from challenges in free translation exercises with Chakali text.

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Carla Bazzanella taught Philosophy of Language from 1991 to 1998 and then Linguistics, Cognitive Linguistics and Pragmatics at the University of Turin (Faculty of Letters and Philosophy) until December 2012. She has published several books (among them *Le facce del parlare*, 1994; *Repetition in dialogue*, 1996; *Sul dialogo*, 2002 ed.; *Linguistica e pragmatica del linguaggio*, 2005; *Numeri per parlare* in collaboration with Rosa Pugliese and Erling Strudsholm, 2011; and *Linguistica cognitiva*, 2014), and many papers in both English and Italian on discourse markers, emotions, context, tense and modality, intensity, indeterminacy, misunderstanding, synaesthesia, color words, and gender studies.

David Bimler holds a BSc in physics and a Ph.D. in mathematical psychology. He is a Research Associate with Massey University in New Zealand. Specializing in multivariate procedures and multidimensional scaling as applied to psychophysics, his research focuses on vision, considering such topics as the perception of color and facial expressions of emotion.

Rachael Hamilton completed her doctoral research as part of the AHRC-funded Mapping Metaphor project with the Historical Thesaurus in English Language at the University of Glasgow, where she was also awarded her undergraduate and Master's degrees. Rachael's thesis forms an in-depth case study on how the semantic category of color overlaps with other domains. Her research interests include color semantics, metaphor, metonymy and corpus linguistics.

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Irene Ronga is a postdoctoral fellow at the University of Turin, Department of Neuroscience – Department of Psychology. She is mainly interested in interdisciplinary studies, combining together linguistics and neurophysiology, with particular focus on sensory experience. Her

publications include *Linguistic synaesthesia, perceptual synaesthesia and the interaction between multiple sensory modalities* (2012) and *Black as night or as a chimney sweep? Color words and typical exemplars* (2014).

Jodi Sandford, Ph.D., is Researcher/Professor in English Language and Linguistics at the University of Perugia, Italy. Her research is specifically in cognitive semantics, and has covered the application of embodiment and conceptual metaphor theory to the visual sensory domain and color, to the analysis of comparative conceptualization in English-Italian, and to other experimental studies in categorization, entrenchment, implicit attitudes, fictive motion, and the understanding of Manner.

Jada Schumacher is an Associate Professor at the Fashion Institute of Technology in New York City. She earned a Master of Architecture from the University of Texas at Austin and a Master of Fine Arts in 3D Design from Cranbrook Academy of Art. She exhibits around the globe and lectures on color at venues such as El Salvador Color Week and Harvard University. She is the Founding Director of designorange and its sister studio Zest Color Design.

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Erling Strudsholm is an Associate Professor of Italian Linguistics at the University of Copenhagen, where he obtained his Ph.D. in 1997 with a thesis on *Relative situazionali in italiano moderno* (1999). He teaches Italian Linguistics, Sociolinguistics, and the History of the Italian Language, and in recent years his research activities have been in historical linguistics, sociolinguistics, and textual linguistics (*Strutturazione testuale in italiano e in danese*, 1999, in collaboration with Gunver Skytte, Iørn Korzen and Paola Polito), and numbers and color words in everyday language (*Numeri per parlare*, 2011, in collaboration with Carla Bazzanella and Rosa Pugliese).

PART I:

BASIC, EVOLVING AND ESTABLISHED COLOR TERMS AND CATEGORIES

CHAPTER ONE

HOW UNIVERSAL ARE FOCAL
COLORS AFTER ALL?
A NEW METHODOLOGY FOR IDENTIFYING
FOCAL COLOR TERMS

MARI UUSKÜLA AND DAVID BIMLER

1. Introduction

A large number of studies over several decades have supported some form of the Linguistic Relativity Hypothesis or LRH (Whorf 1956), drawing evidence from semantic realms which include color naming and categorization, object categorization, and representation of space and time. The LRH proposes that the language we speak influences our cognitive representation of the world. Thus the studies focus either on the cognitive representation of reality among bilinguals (Ameel et al. 2005, Athanasopoulos 2007; 2009) or on conceptualization of the world in different languages and cultures, using several naming, memory and perceptual similarity judgment tasks (Davies and Corbett 1997, Davies 1998, Davies et al. 1998, Roberson et al. 2000, Boroditsky 2001, Malt et al. 2003, Roberson 2005, Roberson et al. 2004, Roberson et al. 2009).

Linguistic relativity is far from an accepted consensus, and here we are primarily concerned with its Universalist antithesis. Conflict between rival interpretations have been especially salient in the domain of color, where Brown and Lenneberg (1954) presented a strong relativist thesis, that color is a homogenous semantic realm which languages carve up and categorize in an essentially arbitrary fashion. This inspired the Universalist position, which as currently formulated, proposes that color categories across languages are structured around a short catalog of pan-cultural foci in color space (Kay and Regier 2007, Regier and Kay 2009). Six foci correspond to the English terms yellow, red, green, blue, white, and black: the so-called Hering primaries. The 'borderlands' between these can

generate finer categories corresponding to the English pink, orange, brown, purple and gray, while fused combinations can create the broader categories of 'grue' or 'yellow-green' or 'dark' encountered in other languages. Depending on the degree of differentiation or fusion, the color lexicon in any language falls somewhere along one of a small number of determined evolutionary 'sequences'. Languages generally possess from 2 to 11 color terms, whether or not they possess a word recognizing color as a distinct semantic domain.

Following Lenneberg and Roberts (1956) and Lenneberg (1967), much of the research has been conducted with standardized 'palettes' of color samples, often a 'Munsell palette' defined by a grid of hue / lightness combinations where each combination is represented by the most saturated version available in the Munsell range. In one of the 20th century's most influential studies in linguistics and anthropology, Berlin and Kay (1969) combined 330 Munsell 'chips' or tiles with elicitation and mapping tasks. After completing a list task, subjects were requested to indicate both the 'focal hues' for each basic color term and its outer boundaries.

The initial monograph met with criticism for its limited sample of languages, the dependence for most of those languages upon single bilingual informants from the San Francisco Bay Area, and the confounding factor of the informants' English-language skills. However, it served as "a pilot project for the WCS" or World Color Survey (WCS 2009: 5) and the Mesoamerican Color Survey (MacLaury 1997). The WCS extended the empirical methodology to 110 languages from less technological societies around the world, collecting data that allowed the initial hypotheses to be revised and amended (Kay and McDaniel 1978, Kay et al. 1991, Kay and Maffi 1999, Regier et al. 2005). Crucially, data from the WCS support the original Berlin-Kay hypotheses that 1) color naming is a universal phenomenon, and 2) the manner in which languages encode color categories tends to conform to universal constraints. That is, they rule out strong forms of linguistic relativism where naming is unconstrained.

Eleanor Rosch Heider collected supporting evidence in the course of fieldwork among the Dani of New Guinea. Although Dani evinced only two words for color (Rosch 1972, Rosch and Olivier 1972), cross-cultural focal color areas were more salient and more frequently referred to by basic color names than other (or non-focal) areas, among children as well as adults (Rosch 1971; 1972). Moreover, focal color areas were more frequently chosen by 3-year-olds and better matched by 4-year-olds. In her later works, by calling these areas "prototypes", Rosch established the influential prototype theory. However, although she interpreted her observations within the Universalist framework, most were also compatible

with the Whorfian thesis and interpretation of her focal-color findings remains controversial.

In the course of the evolution of the 'universalist synthesis' on color naming, perception and categorization, universalists conceded ground to the weak relativists, accepting that color naming differences do exist across languages, and that languages with the same number of color categories may diverge in where they draw the boundaries between these categories in color space (Regier et al. 2007, 1436). One could say that Universals rough-hew our hue categories but acculturation and language acquisition shape them. Debate continues on the extent of variations in the category *foci*. Even in weak, compromise forms, the Universalist perspective presents these as fixed landmarks in color space, while relativists argue that if color categories are malleable enough to be influenced by linguistic experience, then color foci should vary significantly among languages (Roberson 2005).

In order to compare the predictions of the universalist and weak relativist positions, the present study investigates whether focal colors or best examples of colors are salient enough to be distinguished in an unconstrained naming task (in contrast to a specifically designed focal color task such as "Please show me the best example of color X in an array"). An alternative set of 65 color tiles was used, featuring stimuli at varying levels of saturation, i.e. samples from the interior of the "color solid" as well as from its surface. Speakers of eleven languages were tested, with color inventories ranging from seven to 11 basic color terms (most possessed exactly 11 BCTs), but reference to appropriate color regions seemed to be independent of the presence or absence of other terms. Data were compared with results for Russian and English speakers published by Davies and Corbett (1994a; 1995) (with the caveat that those data are truncated, as space allowed the authors to list only the two most common terms assigned to a given tile, meaning that we do not know all the tiles to which a given term was assigned). The naming data indicate consistent differences across languages: The languages not only denoted color space differently, but reflected variations in differentiation of color foci or best examples of each color category.

Lenneberg observed in his Biological Foundations of Language: "Notice that there are certain colors which all subjects call by essentially the same name whereas other colors are sometimes called by this and sometimes by that name" (Lenneberg 1967, 342). This statement elegantly depicts the purpose of the present study: to distinguish best representatives of nine color categories in a naming task, by a majority of the test subjects for each sample language. This approach also accords with Rosch's early

studies in which she referred to focal points as salient areas in color space (1972).

2. The languages

Native speakers of eleven languages, from three different language families, participated in the experiment as part of a large-scale project carried out at the Institute of the Estonian Language in Estonia under the research grant entitled "Areal or Universal: Basic colour terms in the Baltic Sea, Central European and Mediterranean areas" awarded to the first author. The data for Russian and English were adopted from Davies and Corbett (1994a; 1995). Table 2.1 shows the genetic affiliation and estimated number of speakers of the 13 investigated languages based on *Ethnologue* database records. Further data were adapted for Catalan (Davies *et al.* 1995) and Arabic (Al-rasheed 2010) to illustrate particular points.

Despite the phylogenetic diversity of their origins, all the languages examined here are from technologically advanced societies: the sample does not contain any traditional rural languages. The majority are standardized official languages with high prestige. The exceptions are Udmurt and Komi-Zyrian, which have far lower prestige than Russian (Csúcs 1998, Ryabina 2011a and personal communication).

Readers may be less familiar with the Udmurt and Komi languages, both members of the Permic group of the Uralic language family. The former is spoken by approximately 30 per cent of the population living between the Vyatka and Kama rivers in the Udmurt Republic within the Russian Federation (Csúcs 1998, 226). Udmurts account for a minority in their own historic republic. The proportion of Udmurt speakers is significantly higher in villages than in cities: While approximately 10–15 per cent of city dwellers can communicate in Udmurt, up to 80 per cent of villagers use Udmurt on a daily basis (Ryabina personal communication, Csúcs 1998, 226). Ryabina noticed the decrease in spoken Udmurt when she was carrying out her interviews. The younger generation has either never been exposed to Udmurt or has lost the ability to speak it. The current condition evolved from the absence, under the Soviet Union, of any education in Udmurt. Under such circumstances, the majority of the Udmurt-speaking population will probably be completely Russified in the coming decades.

Partly due to low population density, Komi has historically evolved into three dialects: Komi-Zyrian, Komi-Permyak and Yaz'va (Hausenberg 1998, 305). The only Komi dialect considered in this chapter is Komi-

Zyrian. Komi speakers live in the Komi Republic of the Russian Federation, mainly in the Vychegda basin. They also have compact settlements in the Kola Peninsula and western Siberia. Similar to Udmurt population, only approximately 15 per cent of ethnic Komis speak the language. This was particularly pronounced in Syktyvkar, the Komi capital. Ryabina saw even greater mother-tongue loss in the Komi-Zyrian population than with Udmurt speakers. Dense code-switching among ethnic Komi speakers is part of everyday speech. Just as with the Udmurt group, the younger generation might not have been exposed to Komi-Zyrian language (Ryabina and Kuznetsov, personal communication).

Table 2.1. Languages in the study according to their genetic affiliation and number of estimated speakers by ethnologue.com; and for each language sample, the number of subjects, female/male ratio and mean age. * Data adapted from Davies and Corbett (1994a, 1995). ± Davies and Corbett recruited 77 subjects (53 females and 24 males with a mean age of 34), but gender and age distributions were not specified for the subgroup of 54 who performed the color naming task.

Language	Language family	Subgroup	Estimated no. of speakers	No. of subjects	Females / males	Mean age
Italian	Indo-European	Romance	61,696,677	102	56/46	43
Castilian Spanish		Romance	398,931,840	38	20/18	43
Lithuanian		Baltic	3,154,180	51	35/16	42
Latvian		Baltic	1,552,260	50	30/20	33
Czech		Slavic	9,490,840	52	33/19	35
Russian *		Slavic	143,553,950	54	±	±
English *		Germanic	328,008,138	47	23/24	29
Hungarian	Uralic	Finno-Ugric, Ugric	12,501,270	125	66/59	36
Finnish		Finno-Ugric, Finnic	5,009,390	68	42/26	39
Estonian		Finno-Ugric, Finnic	1,048,660	80	53/27	39
Udmurt		Finno-Ugric, Permic	479,800	125	76/49	43
Komi-Zyrian		Finno-Ugric, Permic	293,406	51	37/14	49
Turkish	Altaic	Turkic	50,750,120	56	30/26	36

The Uralic family also includes Finnish and Estonian, within its Finnic subgroup (Viitso 1998, 97). Estonian has historically been exposed to influence from Russian as well as Low German and other languages spoken in the proximity.

South of Estonia are the Republics of Latvia and Lithuania, homes to Latvian and Lithuanian, the two extant members of the Baltic subgroup of Indo-European. Both are spoken in the proximity of the Slavic languages Russian, Polish and Belarus.

Czech and Hungarian are spoken in the Czech Republic and the Republic of Hungary, in the heart of Central Europe. Czech is a Western Slavonic language and Hungarian belongs to the Ugric branch of the Uralic language family, but despite their genetic unrelatedness, they share common typological features. These include phonological similarities (such as fixed initial word stress and distinctive vowel length) and morphosyntactical similarities (Skaliča 1968, Thomas 2008). Similar features and apparent parallels in the domains of vocabulary and semantics have encouraged researchers to place these languages in a common *Sprachbund*, along with Slovak, Slovene, Yiddish, Kajkavian Croatian and the German Bavarian Austrian dialect (Thomas 2008, Skaliča 1968, Haarmann 1976, 97–105).

Within Italian, accent and lexicon are subject to variation, and often betray the origin of speakers. The sociocultural variation of local speech traditions has made code-switching and diglossia part of everyday Italian life (Harris 1988, 19). In this study, *Italian* denotes the Standard Italian variety, descended from medieval Florentine vernacular.

3. Method

3.1. Participants

The sample sizes by language and the composition of a sample by gender and mean age are represented in Table 2.1 (see Section 2). All Italian, Castilian Spanish, Czech, Lithuanian, Latvian, Hungarian, Finnish, Estonian, Udmurt, Komi-Zyrian, and Turkish speakers were volunteers from normal adult populations. Russian and English data were adopted from Davies and Corbett (1994a, 1995). All interviews were carried out in participants' native languages and in their respective countries and in conditions as near as possible to everyday environment. Subjects also answered a biographical questionnaire to collect data about their linguistic and social background and to confirm that all were native speakers.

The Italian group comprised Italian nationals who professed to be first language Italian speakers. They were interviewed between 2006 and 2009 exclusively in the city of Florence and surrounding neighborhood by a fluent L2 Italian speaker (author MU). Castilian Spanish subjects were interviewed by a fluent Spanish speaker in Madrid in 2013. The Castilian Spanish group consisted of 38 individuals. The Czech group consisted of 52 native speakers, who were interviewed in the Czech Republic in Brno and Prague in March 2007 by a fluent L2 Czech speaker (author MU). Fifty-one Lithuanian speakers were questioned in Vilnius and Rokiškis in September 2009 by a native Lithuanian experimenter. Latvian subjects were interviewed in 2013 in Riga and Daugavpils by a native speaker. The Hungarian group constituted 125 native speakers interviewed in two stages: 40 subjects were tested in the year 2002 and 85 subjects in 2003. The interviews were carried out by a fluent L2 speaker (author MU) in Budapest, Debrecen, Pécs and other regions across Hungary. The Finnish sample comprised 68 native speakers questioned between 2005 and 2006 in Helsinki, Turku, and near Tampere by a fluent L2 researcher (author MU). All Estonian speakers were native speakers interviewed in Tallinn, Tartu and other regions by a native Estonian speaker (Sutrop 2000). All Udmurt participants were native speakers, with a good knowledge of Russian, interviewed by a native Udmurt speaker (Ryabina 2011a). Komi-Zyrian speakers were all native speakers with a good knowledge of Russian. They were interviewed in 2008 and 2009 by an L2 Komi speaker (Ryabina 2011a, 39–40). Turkish participants were all first-language Turkish speakers interviewed by a fluent L2 Turkish speaker (Rätsep 2011). The majority of participants had attained higher education or a university degree. All participants had normal color vision.

3.2. Stimuli

Stimuli were a standard set of 65 colored papers chosen from the Color-aid Corporation (CAC) 220-papers array. CAC papers use a modification of Ostwald's color system (Ostwald 1939), which describes the characteristics of a color by three parameters: color tone, i.e. *hue*; proportion of white, i.e. *tint*; and proportion of black, i.e. *shade*. The CAC uses 24 chromatic colors: six basic colors, i.e. Y – yellow, O – orange, R – red, V – violet, B – blue, and G – green, and their transition tones, e.g. RO – red orange, ROR – red orange red, etc. Each pure hue generates four light variants T1 – T4, in which the proportion of white progressively increases, and three dark variants S1 – S3, in which the proportion of black increases. The gray scale is also divided into eight grades according