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A Retrospective Survey of the Problems with Berlin and Kay (1969)

Abstract. Berlin and Kay's (1969) *Basic Color Terms* is often held up as a seminal study in the universality of color terminology, perception and categorization. However, the study is deeply flawed by misapprehension of the theory of language relativity; the core assumptions of the researchers; by selection bias; by faulty methodology and ill-equipped research personnel; and by an array of contradictory and incomplete empirical evidence.

Introduction

Berlin and Kay's 1969 study of color terminology is often held up as being a seminal study in the universality of color terminology, perception and categorization. Chiu and Hong (2006) in their *Social Psychology of Culture*, printed nearly 40 years after Berlin and Kay's research, refer to it as "reveal[ing] that, contrary to the linguistic relativity hypothesis, there may be a universal perceptual order independent of language" (p.188). Steven Pinker, arguably the pre-eminent popular linguist alive today, alludes to Berlin and Kay's (1969) findings in his *The Language Instinct* as providing the basis for the claim of universal color categories (p. 62). Grey (2008) attributes to Berlin and Kay (1969) the truism that "This set of eleven [basic color terms] seems therefore to be a semantic universal." Generally, It is generally accepted that there are cross-linguistic universal tendencies in the naming of colors. This is due in large part to the findings of

Berlin and Kay (1969), who found universal patterns in color naming data collected from a variety of languages. (Kay, Regier, Cook & O'Learey, 2003)

It should be noted at this early stage that there seems to be a continual slipping, if not outright confusion, between the concepts of perception and categorization. For the record, no one has argued that people who speak different languages perceive different colors – for instance, that English speakers see red and "red" whereas the Bantu language causes the retinal cones of Bantu speakers to perceive red as some other color, say, green. However, Israel Abramov, calling on his research and experience in the fields of psychophysics and electrophysiology, especially as regards to the phenomenon of color, challenges Berlin and Kay's (1969) assumption of the possibility of objectively evaluating color and color perception with the assertion that for all that we know about color, scientists cannot yet answer even the basic question, "Do we all share common color experiences, regardless of our cultural backgrounds?" (p. 114-5). Perhaps, in accordance with Abramov, we cannot answer the question of our shared experience of color, but perhaps we can answer the question, is Berlin and Kay (1969) credible and reliable?

Biased from the Beginning

Berlin and Kay's biases cause the researchers to selectively admit data which agrees with their study's premises and omit data which contradicts it. Berlin and Kay's (1969) methodology was flawed, as it was marred by biased assumptions. Though they admit the "firmly established" principle that "each … language must be approached in its own terms, without a priori theories of semantic universals" (p. 1), Berlin and Kay (1969) do just the opposite. Berlin and Kay write that their study began with an "intuitive experience in several languages of three unrelated major stocks. Our feeling was that color words translate too easily among various pairs of unrelated

languges for the extreme linguistic relativity thesis to be valid" (p. 2). First, it appears from this that the researchers approached the study with a bias: an "intuitive … feeling."

From the outset, Berlin and Kay (1969) seem to misapprehend the Whorfian idea of language relativity. They mistakenly apply to Whorf the idea of "total arbitrariness of the way languages segment the color space" (p. 2), whereas Whorf (1939, 1950) repeatedly referred to "habits" or "categories," never to either deterministic nor to "total arbitrariness" in the sense that language is divorced from common and shared human experience. What is truly arbitrary, which is to say random, about language is the particular words that are applied to concepts. Whorfian theory does not argue that the categorization of concepts and experiences are arbitrary in the sense of being random, but that such categorizations are particular to individual language-cultures. Nobody argues that colors are perceived differently by speakers of different languages – after all, languages do not change the color rods in a human beings' eyes – but rather that given the same objective phenomena, each language interprets and *names* each phenomenon according to a distinctive system of classification.

Parenthetically, like many who seek to tilt at the Sapir-Whorf hypothesis, Berlin and Kay overstate the hypothesis, speaking of the "prevailing doctrine of American linguists and anthropologists … of extreme linguistic relativity" (p. 1) – a position which, to my knowledge, is only taken by *critics* of the relativity theory who wish to construct and then knock down the theoretical "strawman" – the "total semantic arbitrariness in the lexical coding of color," even though nowhere has the claim been made that either color terms or any other terminology is "totally arbitrary" in that it is divorced from the physical reality which we all share.

Mistaken Assumptions about the Nature of Color

Berlin and Kay's study is fatally flawed by a fundamental and mistaken assumption about the

nature of colors. The basic assumption under which the researchers labored is that colors can be abstracted and separated from their "real world" manifestations. This abstracted quality of color is largely an English-language and Western concept, though one might say, one increasingly embraced by much of the modern, industrialized world, but one which does accord with many of the language-cultures examined (and left unexamined) by the researchers. One need only consider that in the "real world," there is no abstracted green, red, blue – colors do not exist apart from the material that embody them. This is demonstrated by many instances of color categorization which categorizes color within the context of its manifestation.

This non-abstraction of color is recorded in some instances in Berlin and Kay's own work. They report one of their student researchers reporting on an exchange with a Naisoi speaker (Naisoi is a South Pacific language): "On the few occasions I asked about color words, pointing to the specific objects I perceived as blue or green, informants replied *pani pino oro*, "looks like the sky," or *ba pino oro*, "looks like a leaf" (p. 57). In other words, the speaker clearly linked colors with objects which manifested them in living experience. A similar occurrence is reported for the Mazatec of Native Americans in Mexico; blue and green are often referred to by reference to the sky and grass, respectively (p. 78).

Not only do different languages categorize colors and the boundaries between colors differently, but sometimes languages do not segregate hue from the material that contains that hue in the same way that English does. The researchers conveniently and quite consciously omitted language categories which did not fit English-language patterns. Not only did they exclude "non-basic" colors, deciding on the basis of English-language typographies what was "basic" and what was not, but they eliminated from their study words that encompassed categories of color that English color terms do not encompass. So, for instance,

> In the Phillippine language Hanunóo the reference of 'colour' terms is not even wholly determined by chromatic properties; it is partly determined by the variable of wetness or drynesss …. Perception of wetness or dryness can override the hue variable in determining the suitable Hanunóo colour word … (Sampson, 1997, p. 61).

The categorization of colors is not absolute and in many cases includes qualities that the English language does not conceptualize or categorize as color, at all, such as the material, not just the hue. As Lucy (1997) notes, even the tile matrix that Berlin and Kay (1969) employ is a language and language-culture conception, and one that is not universally applicable, and the insistence on its use constitutes a kind of Procrustean Bed – the forcing of other languages into English-language categories. While Berlin and Kay (1969) do discuss the non-English matrix of color terminology the Phillipine language of Hanunóo, for instance, "The term for 'BLACK' in Hanunóo, (*ma*) *biru*, ranges over black, violet, indigo, blue, dark green, dark grey and deep shades of other colors and mixtures" (p. 28), one must wonder about the forced and rather arbitrary nature of Berlin and Kay's translation of a color term as "black" – a term which in the original language indicates colors ranging from black to violet, green and even encompassing "other colors."

A more extensive analysis can be performed on a language for which there is documentation, Scottish Gaelic. Several problems emerge from Berlin and Kay's gloss of colors – though they do not include this language in their survey – and those problems revolve around Gaelic's much different system of categorization from the English language system, as noted by Black (1987). Gaelic contains several color terms which refer to material as well as what English tends to abstract as isolated pigment. The same term may refer to two or more different colors depending on the material, or the same color may be referenced by more than one term. Also, unlike English, gender plays a roll in determining color terminology in at least one instance.

Certainly in some cases, a color term may be polysemous. In Gaelic, for instance, *dubh* is primarily the color term "black," but is used in a metonymous fashion to indicate "ink" (which in historical times was almost always black), somewhat in the same way that "black" referencing the color of a person's skin can indicate race in English, or black funereal clothes. *Dubh* also is used metaphorically as an adjective that intensifies without any regard to color (except, maybe by extension and metaphor – black being an intense, extreme color), *dubh-bhrònach* not being simply sorrowful or sad (which would be *brònach*) but disconsolate – *extremely* sad; another example can be seen in the phrase *thug iad gèill agus dubh ghèill* – they gave it up, yielded totally (Dwelly, 1912/2001, p. 367).

However, there are many attested examples of what in English would be regarded as a "color term" comprising in a language other than English both material and color concepts. Just as two different materials of the same English-language color category might be referred to using different terminology, so too might two words be applied to the same color on different materials. It would be quite possible for a monolingual speaker of Gaelic (something which does not exist anymore) to see the same hue (in the English-language conception) in two different contexts and to ascribe to that same "color" two different terms, such as the *liath* – "grey" – of human hair or the *glas* – "grey" – of an overcast sky.

Nor is this phenomenon isolated to a single instance. Scottish Gaelic has two terms for what in English is called "red": *dearg* and *ruadh* However, the latter term refers only to the color of hair and hence incorporates the material as well as the hue of the object observed. Similarly, for the Gaelic speaker, *bàn* does not exist apart from the color of a person's hair, which indicates the color blond. However, this same term *bàn* if applied to the color of an animal's fur or a cow's hide, would indicate what an English speaker would call "white," that same white color, which,

if seen on something else beside an animal's fur, would be called *geal*. By extension, the same hypothetical Gaelic speaker could refer to what an English speaker would consider two different colors – white and blonde – as being categorized under a single term – *bàn*.

Likewise, b*uidhe*, the Gaelic word often defined as "yellow" (Black, 1987, p. 139; Robertson & MacDonald, 2004, p. 23) is a color which likewise defies English-language categories, as it encompasses not only the color of oranges, but also that of blonde hair, "*usually of girls*" (Black, 1987, p. 139, my emphasis), thus adding a *gendered* quality to color, which Berlin and Kay (1969) did not take into account in their survey.

In another way, the Gaelic words *uaine* and *gorm* confound English-language color categories. The former, which is often glossed as "green" (Robertson & MacDonald, 2004, p. 124) in Gaelic-English dictionaries, takes a much narrower band of the color spectrum than does *gorm*, often translated as "blue" (Robertson & MacDonald, 2004, p. 67), which encompasses

> Blue; emerald, i.e. the green of healthily-growing grass and leaves; the colour of smoke; refers also to the bluish appearance of blackfaced sheep and other very black or polished surfaces … [including the skin color of Africans] *fear gorm* … (Black, 1987, p. 139)

This spectrum of this color – *gorm* – ranges from the color of grass (reminiscent of the English-language expression, "the blue grass of Kentucky") to nearly black; this is a category that does not exist in English.

Other forms of color classification are possible. While Gaelic shifts the boundaries of the color spectrum, Vietnamese seems to have adopted sub-categories for blue and green under a broad green-blue umbrella. (I've purposely avoided the more common phrasing of "blue-green" because this idiom has a particular meaning in English). Alvarado and Jameson (2002) document the use of modifiers in the identification of colors in Vietnamese, reporting that the majority of color terms used by monolingual speakers were modified, rather than basic. In Vietnamese, the

"parent" color category for the green-blue range of the color spectrum seems to be *xanh* which is modified to signify exactly what 'shade' of the umbrella category is being referred to – *xanh sẫm* for instance, as "dark blue" " (or perhaps, more accurately, to give us English speakers a sense of the un-English categorization – "dark *green-blue*"; *xanh lá cây* as "green like leaves" and *xanh da trời* as "blue like the sky." Just in this we can see how difficult to translate color terms and the insistence of the language (as it were) on its own categories. In English-Vietnamese dictionaries, *xanh* is often translated variously as either "blue" or "green" in combination with the modifying analogies (blue like the sky, green like leaves) – *depending on which meaning in English is intended*; but these modifiers in the English translations seem quaintly redundant – almost like saying, "green like green leaves," or "blue like the blue sky – whereas they are really essential to distinguish within the broader *green-blue* category, which the English translations distort or disguise. The terms might be better understood as being more akin to "*green-blue* like leaves" or "*green-blue* like the sky." Jameson and Alvarado (2003) in another concluded that Berlin and Kay's (1969) model did not fully account for the ways that color is actually mapped linguistically.

Similarly, it would be possible that experimenters such as Berlin and Kay (1969) to present tiles to such a hypothetical speaker, and while assuming that the participant would be categorizing colors in the same way that an English speaker would – that is, without reference to the material (or its wetness or dryness, or any other of multiple components of "color" in many languages) – to totally miss other categories of color, such as those which included material or qualities such as wetness or dryness.

In fact, in such a case with the Hanunóo word (*ma*) *biru*, Berlin and Kay (1969) do not mention the components of this term which do not fit into any English-language conceptions of

color – such as “dark, deep, unfading, indelible” (Lucy, 1997, p. 325). Nor do they mention that another color term, (*ma*)*rara’,* refers not just to the “relative presence of red” but also to “dryness or desiccation; desiccated; deep, unfading, indelible” (Lucy, 1997, p. 325).

Nor is Sampson (1997) unfair in his criticism on this count, for as Berlin and Kay (1969) themselves admit, “Color terms that are also the name of an object characteristically having that color are suspect, for example, gold, silver, and ash” (p. 6); consequently, Berlin and Kay exclude those “suspect” items from their inventory. So, even from the outset, Berlin and Kay (1969) debarred from their study color terms which other languages and cultures deemed to be in the color inventory but which did not agree with English-language or culture color inventories. Very conveniently, perhaps not even consciously, Berlin and Kay (1969) in seeking to prove their “intuitive … feeling” that other language-cultures do not categorize colors differently from English, disqualified a large array of evidence of other language-cultures’ categorizations divergent from English.

This might easily be interpreted as an exhibition of cultural arrogance – these English-language, Western academics deeming what is appropriate to be categorized as color and what not; in essence, telling people that what they think are color categories really are not. What is more, these omissions violate what Berlin and Kay claim to be the foundational principle of their study – namely to accept the language-culture’s categorizations. Sampson (1997) makes a much more serious claim against the findings of Berlin and Kay (1969), namely that this exclusion was both purposeful and irresponsible. According to Sampson, what Berlin and Kay did in arriving at their conclusion that languages do not share universal conceptualizations of color was purposely eliminate large areas of data that might contradict their findings by asserting an English-language color scheme and an English-language concept of color. This cannot be overemphasized: To

arrive at their findings, Berlin and Kay (1969) "cooked the books." They refused to consider any evidence that might contradict those same their preconceived biases.

Indeed, Berlin and Kay's (1969) assumptions about the "objective" representation of color is contradicted by scientists who study the physics and the physiology of it. Generally speaking, these studies indicate that Berlin and Kay's supposedly absolute and objective classification of colors is not only highly dependent upon English-language categories, but is not even – within English – as objective and absolute as the authors would have their readers believe. From these, it should be apparent that the two-dimensional array that Berlin and Kay employed is first language based, and what is more, a metaphorical categorization of color – as must be all attempts to "translate" one phenomenon into terminology that is foreign to it; in this case, color into linguistic and visual (graphic) representations. The point is this – colors do not exist in sheets of tile in a two-dimensional framework; to depict them as such is to abstract them, as I mention above, from their natural occurrences.

Abramov (1997) writes, "Our knowledge of color is still filled with surprising gaps and misconceptions" (p. 89), and seemingly confirming the lack of a firm consensus about color, several researchers disagree that Berlin and Kay's tile array is at all representative of the phenomenon of color. Boynton (1997) displays a shape that looks like a two-dimensional geodesic dome. Wooten and Miller (1997) describe color as lines on a graph that look like oscillating sine waves. Sivik prefers a solid shape (represented in two-dimensional form) that looks somewhat like the twin sails of a sail boat – one sail billowing out in front and the other stiff behind; that is, when he is not presenting colors as arrayed in cones or pyramids. Davidoff (1997), on the other hand, pictures color perception as a flow chart that maps the "flow" (this, too, being a metaphor for the cognitive processing of color processing) from visual input, to

pictorial register to object descriptions to object-color knowledge to lexicon and finally to speech (p. 127).

It should be noted in regard to Davidoff's (1997) schematic that necessary to this process is the filtering of the visual input through the categories of language terms that one's particular language offers and the speaker's selection from those terms available. In other words, implicit in this is the conclusion that if one's language-culture conflates two colors, an individual habitually will so categorize those two colors as the same. On the other hand, if one's language-culture differentiates what in English would be see as one color – say, for instance a Gaelic speaker's white of *bàn* on a cow and the white of *geal* on a sheet of paper – then the speaker will habitually also process and speak of these as two different categories of color, *bàn* and *geal*, respectively.

There is not enough time to do justice to these involved and technical discussions of color, nor do we need to go any further than this: Even in English, representation of color differs drastically, ranging across a wide range of conceptual metaphors. Are we really to believe Berlin and Kay's argument that while English speakers represent and categorize so differently as the scientists, speakers of diverse languages do not? Berlin and Kay's tile array is not objective reality but is rather as arbitrary a cultural construct as any other language's grouping of color terms. However, perhaps more importantly, color is an idea, a concept. The word "blue" is not the color itself. Neither is Berlin and Kay's array of tiles the reality of the experience and phenomenon of color. These representations must be recognized as metaphors for the experience of color, and as such, are arbitrary and based on language and culture, whether that culture is that of the Hanuno, the Welsh, or the contemporary English-language academic community.

Unreliable Researchers/Unreliable Research

Berlin and Kay's (1969) methodology was flawed, which resulted in the collected data being unreliable. Another critique that Sampson (1997) levies goes to the issue of their competence as researchers. Apparently, the Berlin and Kay (1969) study employed "students let loose on the great [and not so great] languages of civilization" (Sampson, 1997, p. 63). These students presumably had little knowledge of the languages on which they were writing their course papers, which lead Berlin and Kay (1969) to commit to the record egregious mistakes that no first-year student of the language would make.

This is not to imply that there is anything inherently wrong with the gathering of information by graduate students supervised and guided by professional researchers. However, in a case like this, in a study that is referred to consistently in the literature as a hallmark study of its kind, questions of prejudice, bias, and lack of linguistic background do give reasons for questioning its validity. In this case, there is little indication that the students in question actually knew the languages they purported to study. Such lack of knowledge in the subtleties of a language – indeed in anything other than the most superficial gloss – should hardly be relied upon for such far-reaching conclusions. For instance, the researchers

> [l]ist four basic colour terms for Homeric Greek, including the word *glaukos*. Standard refence works … say that *glaukos* … meant something like 'gleaming,' with no colour reference … they [mis-]translate glaukos as 'black' [whereas] Ancient Greek had a standard word for 'black': *melas* … but *melas* does not appear in Berlin and Kay's list. (Sampson, 1997, p. 62).

Neither is Ancient Greek the only language which Berlin and Kay abuse. Sampson discusses a similar confusion with the Chinese term which is "pronounced *hui* in Mandarin and *fui* in Cantonese," which Berlin and Kay claim refers to a fruit, but which Sampson (1997) writes, "*hui/fui* is the standard common Chinese word for 'ashes'" (p. 63). In other words, Berlin and

Kay simply got the meaning for *hui* wrong. Berlin and Kay translate the term as "fruit," but as Sampson writes, its meaning seems to be very clearly that of "gray" and – though I don't make a point of this in my paper – "ash" or "dust" or "lime." Though he does not offer extensive point-by-point analysis of Berlin and Kay's accuracy (or lack of it,) Sampson (1997) does cuttingly dismiss the study by remarking, "There is no reason to assume [the other unexamined] analyses are more reliable" (p. 63).

Nor do we have to rely on Sampson (1997) alone to ascertain the incompetence of the researchers (responsibility for which, however much assistance they received from student papers, lies with those who put their names on the study). Berlin and Kay (1969) assert that the Welsh language does not contain a word for "brown" (p. 27), but this claim seems to betray a singular ignorance and prejudice – perhaps no brown categorized as the English color, but more of an auburn or bay color, which is a brown tinted with red, … perhaps more likely to be seen in the coloring of horses or human hair (especially in the hair of Celtic peoples) as the central color of the "brown" category. However, a causal search of online Welsh dictionaries reveals at least three words for brown:

gwinau - (adj.)

bay, brown, auburn (Nodine, 2003)

1. bay *adj*. 2. brown *adj*. 3 auburn *adj*. (The Department of Welsh, University of Wales, 2003)

gwrm - (adj.)

dun, dark blue, brown (Nodine, 2003)

llwyd [pl. -ion]

(adj.) brown, fawn; grey (gray) Nodine, 2003)

Similarly, Berlin and Kay's (1969) study has other significant problems that should not go unaddressed. One of these is the haphazard way in which the data was collected. Berlin and Kay did not themselves survey the speakers of the languages studied; the researchers left this task to graduate students, many of whom had little if any knowledge of the languages they were defining and passing judgment on (Berlin & Kay, 1969; Sampson, 2003), which methodology must go to the credibility of the study. Perhaps, because of this, the study is riven with obviously questionable data, such as that on the Tshi language which is drawn from a work published in 1853 but which cannot be located (p. 62). In another instance, notes on Tongan state, "There is no specific color name for blue and possibly none for green, either" (p. 73). *Possibly*? One would think a researcher should *know* before they published. But the absolute howler is the notation on the African Lingan language: "Anderson's knowledge derives from his father who has done mission work among the Lingala" (p. 56). Such open admissions of haphazard and – dare one say – sloppy collection practices should lead to quite strenuous questioning of the entirety of the data. What else did Anderson's father leave out about Lingan or not remember or never learn from his "mission work," perhaps some 20 years previously? What other assertions such as those about black in Greek or brown in Welsh are just simply not true? What hodge-podge of informants did Berlin and Kay's student researchers dig up or which written sources did they fail to adequately comprehend or, as above, even locate?

Furthermore, Berlin and Kay's (1969) student researchers *entirely* relied on informants living in the San Francisco Bay Area (p. 7), which raises question about how reliable what information they did collect was, in the sense that the various language informants might very well already have acculturated to English-language color schemes and categorizations. Presumably, then, all speakers had extensive contact with English speakers, were probably

bilingual themselves (perhaps fluently so), and were significantly acculturated to the English language culture and so very well may have shifted their native color categories in the direction of the dominant English language color schemes. Yet, Berlin and Kay (much less C&H) fail to acknowledgment the potential for language contamination.

As an example of the above statement, in traditional Scottish Gaelic, *gorm* was used to refer to the color of grass; however, in other usages, *gorm* is glossed as what in English we categorize as blue. In contemporary references, Gaels have absorbed the English-language color category of green – or *uaine* – as the color of grass and have shifted their usage accordingly. In such a way, a dominant language-culture can influence the categories of a subordinate language-culture without doing so apparently.

Stanlaw (1997) reports something similar in that Japanese speakers

> who have lived abroad for some length of time often become confused when asked to find the "green" color of the Japanese traffic signal. … Japanese people – for cultural and sociolinguistic reasons – label this color "blue" even though it differs very little from the color of green lights found in most other places of the world … the "color" an object is for Japanese people, then, is something more than just denotatum, wavelength, or habit. (p.241)

To illustrate this point, Berlin and Kay (1969) report that younger speakers of the Nasioi language "would also respond in English or pidgin with 'blue or bluepela'" (p. 57), hinting at such assimilation of the color concepts of the American culture in which they lived. Unexplored is the degree to which information about the color categorizations of the languages is likewise tainted. In other words, if all the informants were residents in a major American city and had presumably already assimilated to American culture, to what degree had they absorbed English-language color concepts and "translated" their native language terms to accord with those of the dominant English. Unfortunately, Berlin and Kay (1969) seem oblivious to even the possibility of such sociolinguistic confusion.

But to the point of the "greenness" of the student researchers (to use an appropriate color term), one must question what weight their graduate professors' own admitted bias played in the students' gathering and selection of evidence. Were these young people predisposed to find the evidence that suited and pleased the preconceived notions of their seniors, men who held their fates – their grades for the course, their graduate degrees, and their future careers – in their hands?

Contradicted by Empirical Studies

Lastly, contrary to Berlin and Kay (1969), a wealth of empirical studies supports the idea that language does play some role in influencing our perception and categorization of color. Several researchers have experimented with color categorizing, memorizing or perception. Studies such as that of Davies, Sowden, Jerrett, Jerrett, and Corbett (1998) found significant language influence in such "objective" phenomena as color recognition, and the memory and categorization of color. This type of study is perhaps one of the most significant of all the different types of studies to the extent that color is an objectively, scientifically measurable phenomenon; that is, each color is identified by a particular band of wavelengths in the visible light spectrum, from around 390 (purple) to 780 (red) – though the exact definitions of where each color shades into another is subject to categorization and interpretation, which processes (categorization and interpretation) seem to be influenced by the linguistic terms available in a person's language to name the various colors.

Garro's (1986) study involving 80 Spanish monolinguals and 10 Tarascan-Spanish bilinguals indicated that memory of color is related to language, and Davies, et al., (1998) conducted an experiment with Setswanna and English speakers in which the participants grouped colors according to affinities. A "universalist" position would predict that there would be no

difference between the color groupings chosen by the different linguistic groups, while the Whorfian thesis would predict that linguistic differences would influence the color groupings. The researchers found there was a small and persistent difference in the color associations between the two language groups, which, they write, support a conclusion that language does influence color perception and categorization. Kay and Kempton (1984) found clear support for this thesis in a test of English and Tarahumara speakers in the recognition and remembering of colors. Likewise, color experiments that demonstrated that color recognition is associated with language and vocabulary were conducted by Santa and Baker (1975); Hepting and Solle, (1973); Ludwig, Goetz, Balgemann, and Roschke, (1972); Van De Geer and Croon (1958); Roberson, Davies, and Davidoff (2000), while Bimler (2005), Jameson (2005), and Roberson, Davies, Corbett, and Vandervyver (2005) produced findings that implied what Jameson (2005) called an "Interpoint Distance Model" – that is, that color perception is neither totally language based (a misapprehension of the Language Relativist position) nor totally universal (the Berlin and Kay position).

Conclusion

In closing, it should be pretty clear that Berlin and Kay's (1969) *Basic Color Terms* is deeply flawed by misapprehension of the theory of language relativity; the core assumptions of the researchers; by selection bias; by faulty methodology and ill-equipped research personnel; and by an array of contradictory and incomplete empirical evidence. Certainly, one of the things any researchers and writers need to guard against in their studies is a Kuhnian (1996) – like entrenchment in a particular paradigm, such as that which the authors Berlin and Kay confess to at the beginning of their work, – namely, that the Whorfian thesis is incorrect and languages do not embed culture. Their study seems to be little more than an extended form of the

argumentative fallacy of "begging the question." If you assume your conclusion as a premise and then remove all evidence to the contrary – as the authors seem to have done in eliminating everything that is different in color categories between languages – then all that will remain are those elements which are similar; however, this methodology is wrong, deeply wrong, no matter how pleasing the results, for researchers must fairly consider all evidence in regards to a certain proposition, not selectively cull for that data which support their own, favorite prejudices.

None of this to suggest that people across language-cultures do not see the same colors, but that perception is linked and related to language in the sense that we see what we are able to name – that is, what we have categories for – and that our categorization of colors differs according the symbol system we employ. The concept of universal color linguistic classification which Berlin and Kay's (1969) study asserts seems to be contradicted by another look at both their data and data which they (sometimes purposely) omitted, and at subsequent studies.

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