

The colonisation of colour categories: How European colour concepts have invaded Polynesian languages

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Abstract

Berlin and Kay propose that there are basic colour terms in any language. These terms split the range of all colours into categories and different languages may have different categories. A meeting of cultures can lead to changes in how a language categorises colour. Across Polynesia, today, we see educational material that purports to teach colour in the indigenous languages, but that categorises colour into the Western European categories, using loan words or repurposed indigenous words to describe colour categories that did not exist in that language prior to colonisation. We describe an ongoing project that tracks changes in language use in Polynesian languages, both before and after colonisation. We present our initial findings.

Introduction

In 1969, Berlin and Kay investigated the evolution of basic colour terms in language [1]. They were working on the underlying hypothesis that every language has basic colour terms, those that are irreducible to other colour terms. A basic colour term describes a category of colours. For example, in English, blue is a basic colour term that encapsulates other colour terms such as cerulean, navy, ultramarine, and azure. Berlin and Kay's 1969 conclusion was that all languages have between 2 and 11 basic colour categories and that basic colour terms get introduced into a language in a well-defined sequence. For example, a language with just two colour categories has words that correspond to light and dark, or warm and cool colours. A language that has three colours always introduces a word for red. The fourth colour to be introduced will be either green or yellow.

Berlin and Kay's work was immediately challenged, on both anthropological and linguistic grounds [2]. To respond to these challenges, and to develop the theory further, Berlin and Kay set up the World Color Survey in the late 1970s, with the support of new collaborators [3]. That has led to a plethora of research in the ways in which languages develop colour terms. The consensus is that the majority of the world's languages do appear to conform to a particular sequence of the introduction of new colour categories.

The introduction of colour categories generally follows the pattern shown in Figure 1. A language at Stage I has two categories for dark/cold and light/warm colours, with Stage II then splitting off the reds into a colour category of their own. The evidence is then that there are several paths to get through to Stage V, which is where a language has six colour categories that correspond to the English black, white, red, yellow, green and blue. Beyond those six colours, languages then introduce extra colour categories, which are almost always some combination of brown, grey, orange, purple, and pink, though with considerable variation in the order in which those colours become embedded in the language [4]. In English, for example, the last two basic colour

categories to be added to the language were pink in the 15th century (named after the dianthus flower commonly called 'pink') and orange in the 16th century (named after the fruit). English, and most other Western European languages, have eleven basic colour categories: black, white, red, yellow, green, blue, brown, grey, orange, purple, and pink. There is some evidence that some languages have twelve basic colour categories, with Russian, for example, splitting the English category blue into light blue, *goluboy*, and dark blue, *sinii* [5]. No language has been shown to have more than twelve basic colour categories.

Berlin and Kay's method for elucidating basic colour categories is first to talk with monolingual speakers to determine the basic colour terms that exist in the language, then to ask specific questions about the colours using carefully calibrated colour chips (Figure 2(left)). For example, one set of questions is to ask speakers to identify all colours that they would unequivocally put into a particular basic colour category. In English, this leads to the chart in Figure 2(right). Note the wide range of colours that might be considered green or blue by an English speaker, but also note the regions of ambiguity (shown in white) where it is not clear into which category a colour should fall.

While most languages fit well into Berlin and Kay's model, Berlin and Kay's theory remains contentious. In particular, there is concern that it prioritises a Western European view of colour, with English's eleven categories of colour somehow being seen as a gold standard. The most challenging critique is the evidence that certain languages appear to have no concept of colour at all, instead referencing other visual properties [8]. That is, when asking monolingual speakers to categorise colours, the concept of 'colour' itself may not necessarily exist in a language and therefore the investigator is referring to a concept that is foreign to that culture.

Research questions and methodology

Our work examines how colour categories have changed in indigenous Austronesian languages across Polynesia. The key questions are: (i) what changes in colour categories reflect Austronesian settlement of various Polynesian islands with different ecologies (3000 BC to 1200 AD)?, and (ii) what changes in colour categories in the target language reflect Austronesian contact with European colonisers (1700 AD onwards)? For the first question, we use standard principles of the Comparative Method in historical linguistics to track the evolution and change of the colour lexicon in specific Polynesian languages, drawing on both the existing reconstruction of Proto-Polynesian lexicon [9] and existing descriptions of individual Polynesian languages, as well as our own evaluation based on open-access data and latest subgrouping models [10, 11]. For the second, we apply the Comparative Method to extant sources: for the 19th and early 20th centuries,

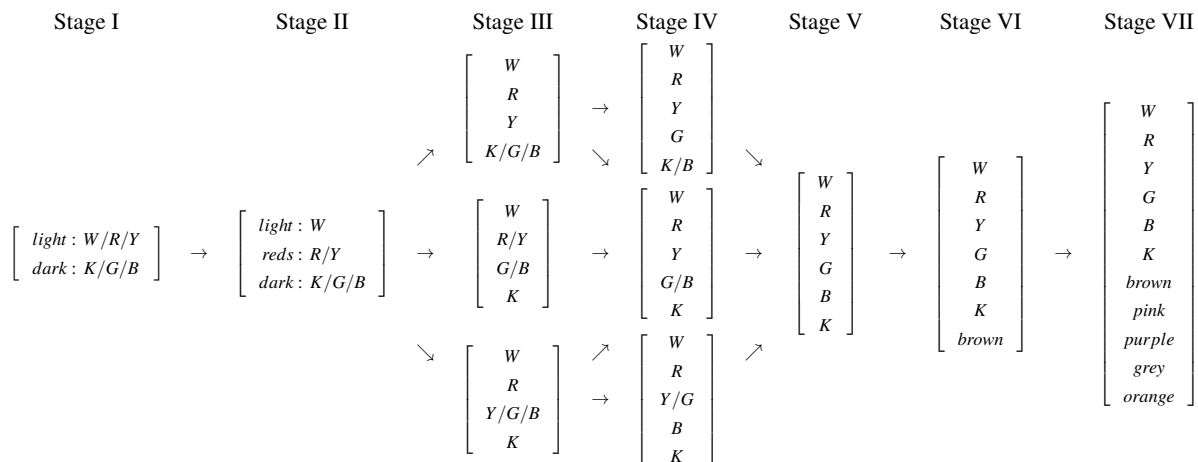


Figure 1. The stages of Berlin and Kay's revised scheme for the introduction of colour categories into a language from two category languages to six category languages [4]. W=white, K=black, R=red, Y=yellow, G=green, B=blue. Stages VI and VII are from the earlier work [1], where brown is normally the seventh colour to appear, and then the remaining four colours appear in an unpredictable order.

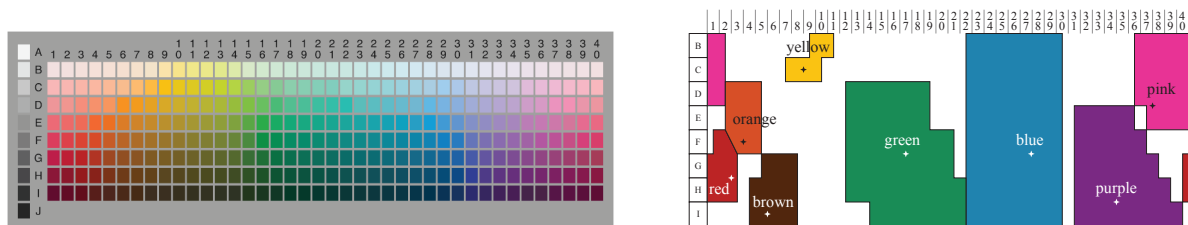


Figure 2. Left: An approximation of the colours of the colour chips used in the World Color Survey experiments [3]. [CC BY 4.0 from [6]] Right: Those colours, from the chart at left, that English speaking participants say that they would, under any conditions, call by the given colour name. The white areas represent colours that were not given an unequivocal basic colour name. The small stars represent the position of the participants' consensus of the 'most typical' example of each colour [Redrawn from [7] based on data in [1]]

these are typically dictionaries documenting the languages as they were used at or just after substantial contact between Polynesian peoples and European colonisers; for the late 20th and early 21st centuries, we also use interviews with living speakers and contemporary materials used in early-childhood education.

Colour categories in Polynesian languages

While Australia and Indonesia were settled over 60,000 years before the present, the wider Pacific was settled by humans over the more recent period 3000 BC to AD 1200 (Figure 3). The relative isolation of the island groups and the infrequent interactions between the groups makes the Pacific an ideal case study for historic linguistic analysis. In the Polynesian triangle the languages are strongly related, all traceable back to Proto-Polynesian, spoken about 1000 years ago, and beyond that back to Proto-Oceanic, spoken about 3000 years ago. Indeed, with some effort, the Polynesian languages can be mutually understood, as evidenced by the 18th century Tahitian navigator, Tupaia, who joined James Cook's expedition to New Zealand and acted as a translator between the English explorers and the local Māori tribes despite having been born and raised over 4,000 km away [12].

European colonisation of the Pacific islands is very recent, historically. While European exploration of the Pacific began as

early as the 16th century, it was not until the early 19th century that there was intensive contact with Europeans and intensive European colonisation began. New Zealand, for example, had some European trader camps in the early decades of that century but intensive, intentional, European settlement did not begin until around 1840. What is of importance to our work, is that there were early efforts made to document the (then unwritten) languages of Polynesia prior to extensive contact with Europeans and there are therefore dictionaries of several Polynesian languages that were drawn up in the earliest years of colonisation, giving a snapshot of language use prior to significant influence from any European language.

The evolution and development of basic colour terms in New Zealand Māori is a particular case study, on which we model our current work. That case study [15] draws on Maori dictionaries published at different times, along with open-access comparative data from the Austronesian Comparative Dictionary and the Polynesian Lexicon Project Online. It shows that the immediate ancestor language, Proto-Eastern Polynesian (PEP), had five basic colour categories in the 13th century and these same five categories pertained in Māori at the start of the 19th century, prior to any substantial contact with Western European languages. It is of note that the Māori word for at least two of the colour categories



Figure 3. The Austronesian diaspora in the Pacific. Polynesia is shown by the blue triangle. Map based on one drawn by David Eccles using data from Chambers [13] and Clark [14]; used with permission under a CC-BY-4.0 license.

altered in response to the settling of new land: yellow changed from the PEP **rega-rega* (still attested in modern Tongan, Cook Islands, and Tahitian) to the Māori *kōwhai* (a bright yellow flower endemic to New Zealand) and green changed from the PEP **mata* (still attested in modern Tongan, Samoan, Cook Islands, and Tahitian) to the Māori *kākāriki* (a bright green parakeet endemic to New Zealand). Despite this environmental stimulus to change the colour terms, there was no stimulus to expand its number of colour categories, which remained at five. Indeed, Proto-Oceanic, an ancestor of PEP spoken around 3000 years ago, also appears to have the same five colour categories [16, 17], showing no environmental or cultural stimuli to expand on the number of colour categories. Given the lack of stimulus to expand the colour categories before colonisation, we work on the assumption that Polynesian languages had five colour terms (black, white, red, yellow, green) prior to significant contact with Western Europeans.

The impact of colonisation

The case study of Māori [15] shows that the Māori language adopted loan words for English basic colour terms in the early years of colonisation, to describe colour concepts for which the language had no existing words. Table 1 shows the colour terms that existed prior to colonisation, the loan words that were adopted from English in the 19th century, and the modern usage that is taught to schoolchildren in the 21st century.

Building on this previous work on a single language, we chose to cast our net wider across the Pacific. We are investigating twenty Polynesian languages, including four (Māori, Fijian, Tongan, Hawaiian) where there is an extant dictionary from the first half of the 19th century and five more (Samoan, Manihiki, Tahitian, Rapa Nui, Mangarevan) that have a dictionary from the second half of the 19th century. The sample of languages shown in Table 2 clearly demonstrates the effect of colonisation on colour terminology. Table 2 shows the modern words for colour in var-

ious of these languages, all taken from modern educational resources for use in primary schools. We see that, even though we are now a couple of centuries past that first contact, all of the languages still show the influence of the colonisers' language on how the indigenous language talks about colour.

Māori offers an instructive case of how this colonisation develops and how a people can reclaim this corner of their language. In the early years of intensive contact with Europeans, in the 19th century, Māori are likely to have followed the practice reported amongst the 21st century Bulu (Bantu) [21], where local colour names are used to talk to other native speakers but loan words are used when communicating with the colonisers. Bulu also offers evidence of another language where the colour system expanded (in the case of Bulu from three to six colour categories) with lexical borrowings from French, the language of the colonists. Huisman reports similar categorial expansion in colour lexicon under socio-cultural pressure in the Japonic family [22].

In the early 20th century, the government of New Zealand actively suppressed use of the Māori language, leaving few native speakers. By the middle of that century, the evidence is that speakers of the language had largely adopted the English colour categories when referring to colour and were using the English loanwords for those colours for which there were no historically-attested Māori words, with the exception of pink: *māwhero*, literally 'white-red', an explicit recognition that the English colour term 'pink' refers to a pale shade of red.

Today, after a significant effort to revitalise the Māori language, almost all of these loans have been replaced by repurposed indigenous words (Table 1): *kahurangi* (blue, literally the cloak of the sky god), *kiwikiwi* (a grey bird), *karaka* (an orange berry), *poroporo* (a purple flower). Two colours have compounds: *māwhero* ('white red') for pink and *paraui* ('yellow dark') for brown, though there is still contention as to whether *paraui* (compound), *parāone* (loan) or *pākākā* (a historically attested word for reddish-brown) should be used for brown.

The three different words for brown, and the three other colour categories that have multiple names, highlight an interesting issue with Berlin-Kay theory: there are colour categories for which there is not one universally-accepted word. This is a feature that is not limited to Polynesian languages. In late-20th century French, there are two equally acceptable words for the brown category: *brun* and *marron* [23]. In English, the closest equivalent is purple, where the word 'violet' is used by some speakers to represent the entire category (that is, they may consider purple to be a shade of violet rather than violet a shade of purple). In many European languages, that category is called violet. In a recent study of Galician, Teixeira Moláns found that young women made fine distinctions between purple, violet and lilac, rather than grouping them into a single category [24]. In Māori, school children are explicitly taught that *pango* and *mangu* are equally acceptable words for the English black, somewhat equivalent to the French *brun* and *marron*. For the English concept blue, Māori has two equally-acceptable recently-adopted words *kahurangi* and *kikorangi*. Some sources are encouraging people to think of *kahurangi* as dark blue and *kikorangi* as light blue, similar to the Russian *siniy* and *goluboy*, but there is no historical evidence that there was ever this distinction. These all show that the issue is more complex than there being one colour term for each colour category.

Table 1. The historic Māori colour words attested in the earliest dictionaries [18, 19]. There are attested historic words for only five English colours. We show the two most common words for each English colour. The loan words adopted for the colours are attested in later works [10, 20]. There is neither an historic nor a loan word for pink. In modern usage two colours (black, blue) have two equally-valid terms and two (brown, purple) have ongoing contention about the correct Māori term [15].

English	white	black	red	green	yellow	blue	brown	grey	orange	purple	pink
Historic Māori	mā	pango	whero	kākāriki	kōwhai						
	tea	mangu	kura	mata	pungapunga						
Loan words				kirīni		purū	parāone	kerei	ārani	pāpura	
Modern usage	mā	pango	whero	kākāriki	kōwhai	kikorangi	parāone	kiwikiwi	karaka	poroporo	māwhero
		mangu				kahurangi	parauri			waiporoporo	
							pākākā			tawa	

Table 2. Colour words in modern Polynesian languages, taken from recent education resources for use in primary schools. Loan words are shown in **bold**. In some cases, there are two or three possible words in the various sources that we checked. We have selected those that make the point about loan words. Note that all languages have at least one loan in the educational resources. The loan for purple may be from the English ‘violet’.

English	white	black	red	green	yellow	blue	brown	grey	orange	purple	pink
Māori	mā	pango	whero	kākāriki	kōwhai	kahurangi	parāone	kiwikiwi	karaka	poroporo	māwhero
Tongan	hinehina	‘uli‘uli	kulokula	mata	engeenga	pulū	melomelo	hina	moli	vāleti	pingikī
Samoan	pa‘epa‘e	uliuli	mūmū	meamata	samasama	moana	‘ena‘ena	‘efu‘efu	moli	violē	pinike
Cook Islands	teatea	kerekere	muramura	matie	rengarenga	auika	paraoni	re‘ure‘u	mākara	vare‘au	tārona
Fijian	vulavula	loaloa	damudamu	drokadroka	dromodromo	karakarawa	kuvui	dravu	seni	lokaloka	piki
Kiribati	mainaina	roroo	uraura	kirīin	baabobo	buruu	buraun		aoranti	beboo	bingke
Hawaiian	ke‘oke‘o	‘ele‘ele	‘ula‘ula	‘ōma‘oma‘o	melemele	polū	māku‘e	‘āhinahina	‘alani	poni	‘ākala
Tahitian	‘uo‘uo	‘ere‘ere	‘ute‘ute	matie	re‘are‘a	nīnamu	rava	rehu	‘ānani	vare‘au	tārona

The colonisation of colour categories

The indigenous languages have clearly adopted words for English colour categories. But, more than this, the indigenous cultures have adopted the English colour categories themselves. Colour categories are a cultural construct: speakers of a language need to agree on what the words mean in order to be able to communicate effectively [25]. As cultural constructs, the colour categories are taught to children as part of their early education. An adult points at objects and tells the child what colour it is. Indeed, colour is one of the earliest abstract concepts that a child understands [26, 27] (that is, the child has to elucidate what is it that, for example, a green bird, a green lizard, a green leaf, and a green fruit all have in common in order to understand what is meant by the abstract concept ‘green’). The educational materials used to teach colour in Polynesia today, by and large, use the Western European colour categories, so those are the categories that modern children are learning, and they do not match the historic colour categories that their ancestors would have used.

Language always develops: It is unsurprising that the Polynesian languages have adopted words to allow the indigenous speakers to communicate concepts that have been brought in by the colonisers. Colonisation-induced language contact, with its clash of cultures, impacts the use of colour terms and colour understanding within a language [21, 28, 29]. Indeed, in the case of two Bantu languages (Mabi and Bulu), Grimm reports ‘It seems that two color systems are coexisting in speakers [of these languages]: a local and a colonial color system. At the same time, the colonial color system appears to greatly interfere with the local color systems. Speakers often gave answers such as, “I know that color, but we don’t have a name for it in our language. In French, it would be *violet*.”’ [21]. It is likely that indigenous speakers in Polynesia used two colour systems simultaneously in the early

days of colonisation, one for speaking within their language community and one for speaking with the coloniser community.

However, modern education tools almost all use the eleven Western European colour categories. This means that children are taught colour names in their own language that are firmly attached to the Western European colour categories. For example, consider the Māori word *whero*. In the early 19th century, this word encompassed those colours that an English speaker would call red, brown, orange, some pinks and some purples. Today, children are taught that ‘*whero* is red’ making a direct link from the Māori word to the English colour category.

Is this a problem? From one perspective, no: language always evolves. For example, before the 16th century, English had no category for the colour orange. If someone wished to refer to it, they called it ‘yellow-red’ (Old English *geoluréod*), and the colour itself would have fit in either the yellow or red colour category depending on the shade. The development of a new colour category was instigated by the introduction of the imported exotic fruit to England.

In another sense, however, it does matter. It is important to understand how previous generations may have thought and, in the case of colour, how they grouped colours into categories. For example, in Māori art, a certain reddish-brown is very common. To European eyes, this colour would be seen as brown, in the same colour category as wood and clay. To Māori eyes, this colour would have been seen as *whero*, in the same category as blood and fire, as well as wood and clay. That difference in perspective may alter how we understand the artist’s intention.

In the final analysis, we cannot stop language development, but understanding where the language has come from can help us to understand historic writings, historic artworks, and traditional creative practice. Our continuing work is to determine the original

categories that pertained in the historic languages and provide evidence to indigenous groups about the historic use of colour terms in their languages and about how colonisation has induced change in how their communities categorise and talk about colour.

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