Linguistic relativism: can language influence thought and vice-versa?

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Abstract

Looking through numerous factors, I attempt to determine whether or not language and thought influence one another, and the direction and strength of that influence. I find that due to the physical world needing description but having no inherent ‘natural terms’ to latch on to, language assigns names to the most salient concepts, which are relative to individual languages and the speakers which use them. However, there do appear to be some aspects of language which are universal and not determined by thought.

1. Introduction

When it comes to understanding concepts such as “tree”, “rabbit”, and “curtains”, there are generally-accepted boundaries to the demarcation of any one of these objects. We can ascertain where the object ends and another begins. However, in a situation where a phenomenon is continuous, such as through the colour spectrum, the demarcations are not naturally present. It is possible to divide up the continuous space of colour in any way you desire. For example, we have separate words for ‘green’ and ‘blue’, something which certain languages, eg. Berinmo, Himba (Malt & Wolff, 2010), do not see fit to distinguish between - but this is only in their language, not their ability to physically discern colour. An example of this in English would be the fact we only seem to have “eleven basic perceptual color categories” (Berlin & Kay, 1969) but in reality, we are able to discriminate between much finer gradients of colour than that. But do these categories have any meaningful effect on the way we discriminate between colours, or are they something relative between languages? Perhaps we will also have to look into how the ‘basic’ terms themselves were defined.

2. Using colour to determine definitional boundaries

In order to ascertain whether it is language influencing the perceptions and thoughts of an individual, we need to rule out all other possibilities. In the case of colour perception, we need to be reassured in the belief that there is not some fundamental link between certain colour spaces and certain neurological outputs. If there exists a mechanism which affects the way we perceive colour in relation to language, then the perceptual colour categories

are likely to be static, and the definitional boundaries of colour words will not vary much between languages.

Davies & Corbett's 1997 study into colour groupings shone an interesting light on the problem. During a test that asked L1 speakers of either Russian, English, or Setswana to freely group 65 coloured tiles into as many or as few categories as they desired. This self-definition of category would allow them to determine if there was any difference between their language's colour word definitional boundaries and the ways that the speakers separated colours in practice. The data in this experiment (Fig. 1) demonstrated that despite having less than half the basic colour terms of English or Russian, speakers of Setswana produced more highly differentiated sets of colours on average.

	English	**Russian**	**Setswana**
Mean no. of groups produced	12.4	12.9	15.9
Standard deviation	6.9	7.3	5.9
Number of basic terms	11	12	5

Fig. 1: Results table for the free-sorting task

However, this is not to be taken at face value. Davies' 1998 paper put a new cohort of L1 English speakers through a series of sorting tests which forced them to differentiate a similar set of tiles into increasingly more groups. At N=11, the participants primarily sorted the tiles into the eleven basic groups. At N=12, dark and light blue were split apart. If we observe that Russian's basic terms distinguish between light blue and dark blue, and that English speakers tended to sort the light blue tiles apart the dark blue ones regardless of a basic linguistic distinction, we can see the limitations of this method. According to this experiment, perception of the colours in an external space appears to override any of our own terms we have, supporting the case of linguistic universalism. However, the lack of correlation between the number of basic terms and the number of sorted groups in the case of Setswana speakers should lead us to consider what we mean by "basic colour category". Perhaps we could argue that the Setswana people felt their lexical groups were 'too broad' and so created new subgroups which better reflected what they actually saw the tiles as. Whereas, the English and Russian speakers may have felt that their languages' colour groupings were too narrowly-defined to break the tiles down into any more categories. Furthermore, the quantity of tiles given out may influence the number of groups produced. Regardless, these points demonstrate a propensity towards a universal colour grouping that seems independent of language terms.

2.1. Criteria for basic colour terms

Berlin & Kay's original definition spoke of monolexemity, uniqueness, universal applicability, and salience. However, monolexemity is merely a coincidental feature of English basic colour words, according to Philip (2006) - perhaps other languages use referents to physical objects with a matching colour. I believe that universal applicability is

also a suboptimal choice of restriction; they state that 'blond' is unacceptable as a basic term because its use is "predicated only of hair, complexion and furniture". Of course, blond *can* be used to describe other things. As for uniqueness, it could be argued that the 'basic' colour terms could be broken down into compatible constituents, ie. red becoming mahogany, rose, crimson, etc. Arguably, those would still fit the definition of uniqueness, and, depending on the individual, they would still be salient. But red is the larger, more psychologically relevant set, so the definition holds.

Davies & Corbett's 1995 paper collated evidence that there is a difference in reaction time for speakers who are asked to name Berlin & Kay's basic colour terms, versus other non-basic colour terms. (Fig. 2)

	Russian	Japanese	American[1]
Basic colour terms	1646	2150	1736
Non-basic colour terms	2169	2480	2380

Fig. 2: Response times to colour stimuli in milliseconds (Boynton & Olson, 1987, Uchikawa & Boynton, 1987, Moss, Davies, Corbett & Laws, 1990)

This data, while demonstrating there is a psychological predisposition to basic colour terms, does not necessarily say anything about the inherent fundamentality of those terms. We could conceive of a world in which 'teal' and its associated translations was considered a colour term, and therefore appeared more salient for speakers to assent to. Furthermore, when the basic colour terms were broken down into 'primary' (white, red, black, yellow, green, blue) and 'secondary' (brown, purple, pink, orange, grey) in accordance with Berlin & Kay's hierarchy of colour, the difference in response times was less statistically significant, and often did not align with the hierarchy. The overarching point behind all of this is to show that what we consider 'basic colour terms' are often more thinly separated from other terms than we might expect. A further report within Davies & Corbett (1995) shows that for English and Russian texts, the highest-frequency non-basic colour terms appeared more frequently than the lowest-frequency basic colour terms.

But, use does not necessarily make a colour term are fundamental. Perhaps common use of a colour term is more to blame for its quick reaction time rather than the abstract salience of the colour itself, demonstrating that in some cases our language does shape the way in which we react to the world.

[1] This particular American study was the work of Boynton & Olson (1987) and did not include black as a response colour.

3. Other explanations for linguistic groupings

3.1. Psychological effects of colour on mood

If we are to try and look further into our neurological dispositions toward colour groupings, we might find that even infants, unable to traditionally distinguish colours, appear to understand certain wavelengths of light as perceptually different from others and react accordingly. (Bornstein, Kessen & Weiskopf, 1976, Franklin & Davies, 2004) Other experiments (Brown & Lenneberg, 1954) have tried to assign colour attributes (hue, saturation, brightness) with calculable "distinctiveness" criteria in an attempt to find the most salient colour in a group that 'anchors' that set of colours. They argue that mono- or low-syllabic words for colours that are more well-agreed upon are more likely to be memorable - but are they memorable because they're monosyllabic or 'catchy', or is it the other way around? Casey & Bartlett (1978) found that the development of child colour term learning is a slow process, and that the acquisition of progressively more nuanced and advanced colour terms continues into adulthood.

Perhaps there is some two-part relation between colour and linguistic expression - one that takes into account the psychological effects that colour has on the mind. One famous example of this is "drunk tank pink", which has been shown by Pellegrini, Schauss & Miller (1981) to have "No overall aggression-reduction related to pink" - although their findings did not have an impact on the amount of Western prisons using pink in their detainment cells. (Genschow, et al., 2014) The literature on colour psychology has extremely varied results, Küller et al., 2007 & Varkevisser, Raymann & Keyson, 2011 seem to demonstrate that there is no link between ambient lighting and mood in working environments, but vibrant colour appears to increase mood slightly. It appears that the correlation between colour and emotional output is not based on hue, which is the primary attribute used to distinguish between colours.

3.2. Object distinction universality

Having explored the boundaries of colour boundaries and their relations to linguistic relativism, perhaps we can examine one of the statements in the opening paragraph in order to glean more insight. Objects and quantities may have 'more objectivity' than the boundaries of colour in that they are communally recognised by a greater number of languages - but that does not mean that all languages are alike. C. Everett & Madora (2011) posits that numerical terms are not necessarily required for the distinction of quantities above 3, citing Frank et al. (2008) and anthropological work with the Pirahã tribe. This contradicts D. L. Everett's 2005 work with the Pirahã that states certain terms are required for perception of concepts, ie. you must have a counting system in order to be able to refer to things as having quantity.

His work is also challenged by Nevins, Pesetsky & Rodrigues (2009) who state that it "incorrectly analyse[s]" the idea that Pirahã lacks any numbers - "…suggests that Pirahã includes two number words: *hói* 'one' and *hoí* 'two' […] differing in the placement of tone." However, it appears that for the Pirahã, having counting terms (and terms for 'half', count nouns, and related concepts) this does not always translate into an ability to match quantities. C. Everett & Madora state that "if the matching task does not require recall or spatial transposition" then they are able to match quantities which extend above their range of counting words, N ≥ 3. This exception which they found complements the colour experiments of Davies & Corbett (1997) that demonstrates that linguistic terms sometimes have little effect on the way the the referents are grouped and perceived in actuality. You do not necessarily need a word for something in order to group it. In these cases, language does not appear to shape the way that the Pirahã or Bantu observe and divide the world up into objects and concepts.

3.3. Universal non-cognate terms

Another way of understanding if thought influences language is seeing if broadly similar external stimuli can bring about the same linguistic response in humans who have been raised speaking dissimilar languages. Dingemanse et al. (2014) used a widespread congruity throughout 31 languages[2] from other-initiated repair to determine that the utterance '*huh*' ([hʌ] in English) was a universal term that had not come about through cognates. They also state that there is "no known phylogenetic precursor" to the utterances, suggesting that the universality of this term is based on something inherent to the human mind, as opposed to an involuntary reaction like a cry of pain.

4. Conclusion

In conclusion, humans have a communicative need to differentiate between concepts like colours and objects, but there exist no exact points through which to divide the space, whether it's the colour spectrum or the continuum of the visual field. Language appears to develop to divide the space into groups, so that differentiation can occur. The demarcations that we make represent what we deem important, which, in turn, affects the thoughts that we have, which lead to the utterances we make. Our language shapes our thought in the way it divides up the world in many cases - but not all of them. In some cases, language is shown to have a large influence on thought, but in other cases, there is a disconnect between the two, like with basic colour term perception with Setswanan speakers.

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[2] 10 of which were from the current study, another 11 were from a previous study undertaken by Dingemanse and a larger team, and a further 10 were from various sources studying the same concept. All are listed in Dingemanse et al. 2014.

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