BASIC COLOUR TERMS IN LITERATURE*

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It is shown that the use of colour words in poetry and literature correlates closely with the order of evolution of colour words, as described by Berlin and Kay. This relationship is independent of the overall frequency of colour word usage. A review of other literature suggests that a number of the psychological aspects of colour *naming* correlate closely with the Berlin and Kay ordering.

In an extremely influential work, the anthropologists Berlin and Kay (1969) have analysed the appearance of "basic colour terms" in different languages. They found that there is a strict hierarchy of colour terms which obeys a single set of rules. Thus if a language has only two colour terms these are black and white; if a third is added it is always red, and the fourth and fifth will always be green and yellow, although the order varies in different languages. The sixth term is always blue, and the seventh always brown. Finally, if further basic colour terms are used these will be selected from purple, pink, orange and grey. Kay (1975) has made minor adjustments to this system. The reasons for this undisputed consistency of order of appearance of colour terms are not clear. Berlin and Kay imply that it has some genetic component (perhaps in the same sense that Chomsky's deep structure must have a genetic component), although Bornstein (1973) has suggested that racial differences in colour vision may be significant, and Allott (1974) suggests that phonetic symbolism and synaesthesia might account in part for the constancy of the order. Kay and McDaniel (1978) related the colour naming to opponent colour processes in the visual system.

In the present paper I would like to report on a relationship between the order of colours as derived by Berlin and Kay and the frequency of usage of colour terms in literature, particularly poetry.

METHODS AND RESULTS

The main data to be considered are derived from the massive analysis of the use of colour words reported by Pratt (1898). Miss Pratt counted all the colour words used in a large corpus of poetry by 17 poets from Gower to Shelley and Keats. Figure 1 shows the number of occurrences of each colour word plotted against the order postulated by Berlin and Kay. If we give scores to each of the colours in Berlin and Kay's scheme (1 for

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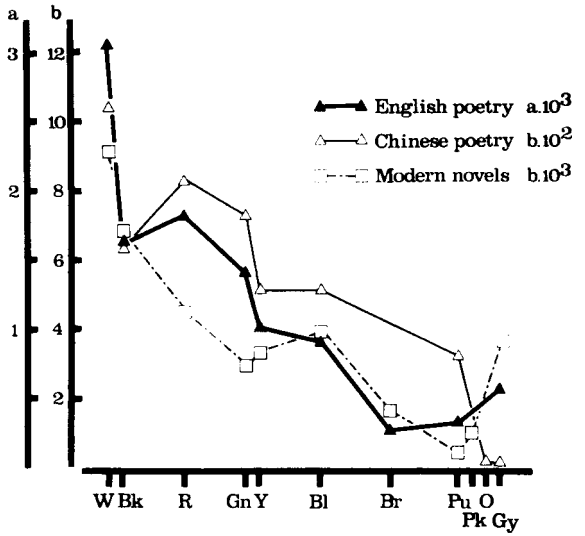

Fig. 1. The frequency of occurrence (ordinate) of colour words in three separate studies, as a function of the words' position in the Berlin and Kay hierarchy. For English poetry (Pratt, 1898) use the "a" ordinate multiplied by 1000; for the Chinese poetry (Chou and Chen, 1935) use the "b" ordinate multiplied by 100; for the modern novels (Evans, 1948) use the "b" ordinate multiplied by 1000.

Abreviations: W: White; Bk: Black; R: Red; Gn: Green; Y: Yellow; Bl: Blue; Br: Brown; Pu: Purple; Pk: Pink; O: Orange; Gy: Grey.

White and Black; 2 for Red; 3 for Green and Yellow; 4 for Blue; 5 for Brown; and 6 for Purple, Pink, Orange, and Grey) then the correlation between the frequency of poetic usage of a colour and the Berlin and Kay order is –0.86. Pratt did not tabulate the usage of pink and orange and these have been omitted; they could well have been incorporated into the scores for red, and hence artificially inflated the position of that point. That Pratt's results are not unique is confirmed by two other studies. Figure 1 also shows the tabulation of Chou and Chen (1935) and the use of colour words in Chinese poetry (based on a total of 459 words), for which the correlation with the Berlin and Kay order is –0.89, and the usage of 4,066 single colour terms in 17 "modern novels" as tabulated by Pauline Evans, and reported in Evans (1948), for which the correlation between frequency of usage and the Berlin and Kay order is –0.77. In the study by Pratt a large variation was found between poets in their relative usage of colour words; Figure 2 shows that the romantic period was particularly associated with increased usage, although the trend was apparent by the time of Pope, and had little effect upon Coleridge, Wordsworth and Byron. Despite large differences in colour word usage, Figure

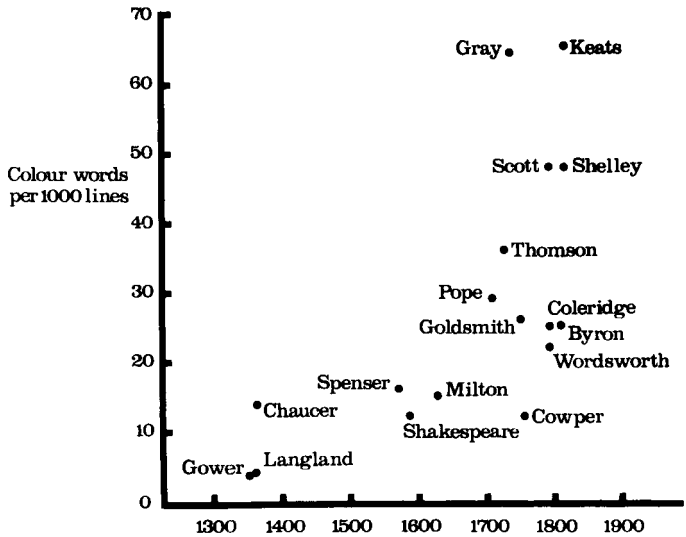

Fig. 2. The frequency of colour word usage by 17 poets as a function of their date of writing (expressed as the year in which they were aged 21). Based on data of Pratt (1898).

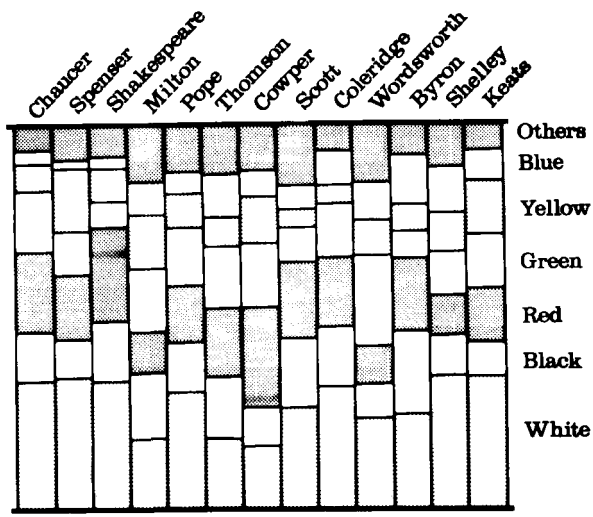

Fig. 3. The relative frequency of colour word usage by 13 poets. Based on data of Pratt (1898).

3 shows that the relative usage of colour words is much the same in the different poets (a small number of poets have been omitted due to inadequate sample size).

A similar trend may be found in word-counts of ordinary writing. Table 1 shows the frequency of colour words in the analysis of Thorndike and Lorge (1944) of almost a million words from magazines ($r = -0.69$ with the Berlin and Kay order) and the analysis of Kučera and Francis (1967) of 1,014,232 words from popular literature ($r = -0.77$ with the Berlin and Kay order).

The general relationship of an increased frequency or salience of words occurring earlier in the Berlin and Kay evolutionary scheme can be found in a heterogenous collection of other variables related to colour words. Table 1 shows the correlation of the Berlin and Kay order with the length of the entry for each word in the Oxford English Dictionary and the Shorter Oxford English Dictionary, the frequency or order in which subjects spontaneously listed colour words (Brown, 1972), the frequency with which subjects listed colour words in a study of their affective value (Gotz and Gotz, 1974), the number of variations on the colour words that were found in poetry (Pratt, 1898), the preferential usage of colour words for imagined objects (Chou and Chen, 1935), and the evaluation, potency and activity of colour words on a semantic differential scale (Adams and Osgood, 1973). In each case there is a correlation, albeit of lesser degree, in the same direction as that found in poetic usage. Lazerson (1977) found a similar correlation between the degree of antonymity of colour-words and their order in the Berlin and Kay schema, and Durbin (1972) showed the number of phonemes in colour words correlated with the Berlin and Kay ordering. In some of the studies there is a suggestion that black and white are treated differently than other colours words (thus in English they are felt to be the "achromatic colours") and hence Table 1 also shows the same correlations after excluding black and white; in the majority of cases this increases the correlation with the Berlin and Kay ordering. Table 1 also shows both Pearsonian and Spearman correlations, which have almost identical results in the majority of cases.

DISCUSSION

There is a strong relationship between the frequency with which poets use colour words and the rank order of entry of those colour words into different languages. The similarity of Figure 1 to Zipf's (1949) plots of frequency versus rank for words in general suggests some ecological optimization of the use of colour words; and indeed Durbin (1972, p. 270) has made a similar suggestion. The same ordering is also found to a lesser degree in a number of other variables associated with the psycholinguistics of colour word usage. The implications are twofold; firstly, the evolutionary age of a word is reflected in its psycholinguistic salience (and perhaps represents a linguistic equivalent of the biological "ontogeny recapitulating phylogeny"); and secondly, there is a suggestion that poets are more sensitive to this aspect of colour words, in that they prefer to use "older" words, perhaps because they have a greater ambiguity, diversity or resonance of meaning. A further possibility is that since Shanon (1982) has recently shown that synaesthesia of colours to linear forms (such as numbers or days of the week) relates closely to the

TABLE 1

The Pearson (Spearman) correlation between the Berlin and Kay order of colour names and a number of other measures

Measure	Source	Correlation with Berlin and Kay ordering: All colours		Excluding black and white	
Colour words in English Romantic Poetry	Pratt (1898)	−0.858	(−0.835)	−0.870	(−0.818)
Colour words in Chinese poetry	Chou and Chen (1935)	−0.895	(−0.892)	−0.924	(−0.943)
Colour words in modern novels	Evans (1948)	−0.770	(−0.778)	−0.483	(−0.564)
Colour words in American English	Thorndike and Lorge (1944)	−0.692	(−0.766)	−0.577	(−0.665)
Colour words in American English	Kučera and Francis (1967)	−0.772	(−0.841)	−0.610	(−0.708)
Length of entry in Oxford English Dictionary		−0.585	(−0.514)	−0.643	(−0.341)
Length of entry in Shorter Oxford English Dictionary		−0.664	(−0.542)	−0.839	(−0.778)
Frequency of spontaneous colour word listing	Brown (1972)	−0.461	(−0.393)	−0.744	(−0.708)
Inverse rank ordering of colour word listing	Brown (1972)	−0.357	(−0.352)	−0.861	(−0.769) Ω
Number of variations of basic colour words in poetry	Pratt (1898)	−0.680	(−0.653)	−0.872	(−0.954)
Frequency of statement of imagined colours	Gotz and Gotz (1974)	−0.334	(−0.289)	−0.839	(−0.848)
Preference of colour words for imagined objects	Chou and Chen (1935)	−0.705	(−0.837)	−0.706	(−0.711)
Semantic Differential Evaluation of colour words	Adams and Osgood (1973)	−0.763	(−0.522)	−0.789	(−0.666)
Semantic Differential Potency of colour words	Adams and Osgood (1973)	−0.225	(−0.232)	−0.652	(−0.667)
Semantic Differential Activity of colour words	Adams and Osgood (1973)	−0.783	(−0.522)	−0.902	(−0.666)

Berlin and Kay typology, that poets use particular colour words because of their synaesthetic properties (and that poets do have such associations is shown by Rimbaud's association in his sonnet "Les Voyelles" of the vowels with colour words – A with black; E with white; I with red; O with blue; and U with green, the order of which shows a correlation of 0.85 with the Berlin and Kay order). Whether the synaesthetic relation to the Berlin and Kay order is because some words are linguistically more ancient, and hence more likely to have developed correlations with other items, or alternatively that some colour words are earlier in linguistic development because of their increased synaesthetic meaning is not at all clear.

Before concluding it is also worth emphasizing that the relationship found relates primarily to colour *words* and not to the colours themselves, and that for instance there is no association between preferred colour word usage in literature and the order of preference for colours themselves (e.g., Helson and Lansford, 1970; McManus *et al.*, 1981).

In conclusion it seems a distinct possibility that poets in particular, and all of us in general, are implicitly aware of the age and power of colour words.

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