NAVAHO COLOR CATEGORIES

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Wie erkenne ich, dass diese Farbe Rot ist? — Eine Antwort wäre: 'Ich habe Deutsch gelernt.' (Ludwig Wittgenstein, Philosophische Untersuchungen §381.)

A discussion of color categories as they function in contexts which are unfamiliar to the reader introduces frustrations and misunderstandings, particularly when the reader's concerns are practical as well as academic and when they involve cross-cultural communication and interaction, for example during anthropological, psychological, or medical research. The reader who questions this observation may enjoy reading the following passage a second time, after he leaves the final word of our article.

Popular conception today assigns color to the cardinal points and in this sequence: t'ping white, to zu'သား sunrise or east; do'သား blue, to k'pyi'သား south; tšo yellow, to e'သား sunset or west; dži' dark, to m'éz'ebó north.3

This article, while making a case for our initial observation, aims at the explication of the general problem of disparate color categorizations; at the description of a technique of eliciting color terminology systematically in relation to scientifically set standards, as applied to Navaho culture; and at the presentation of basic data of the Navaho color lexicon.

1. Color stimuli are classified differently by different groups, no less than by individuals within such groups. A given wave of light has the same length regardless of the nerves which react to it, but the same wave may belong to different 'colors' in different cultures, or, to put it more precisely, the same wave may belong in different cultures, to spectral loci of various ranges. A monolingual Zuni of New Mexico, for example, refers to the spectral locus ranging through yellow and orange as tups'ina; the speaker of English refers to this locus with no single word. And while a bilingual Zuni can translate English orange as olenči, a Navaho of New Mexico and Arizona must use tso for both orange and yellow. Moreover, in different cultures, chains of associations which relate to a given spectral locus vary distinctively. In this connection it would be interesting to study cross-cultural medical problems of the Hanunóo, a tribe on Mindoro

1 Data were collected by the authors in 1955–56 during the work of the Southwest Project in Comparative Psycholinguistics, sponsored by the Social Science Research Council, under the direction of John B. Carroll of Harvard University and the immediate supervision of Joseph B. Casagrande of the SSRC. Landar checked and added to the data at the Navajo Cornell Clinic, Many Farms, Arizona, in 1959–60, on a fellowship of the Social Science Research Council and with the assistance of the Department of Public Health and Preventive Medicine of Cornell University Medical College. We wish to thank the individuals and the institutions that have contributed to this article with data, advice, and support; special thanks are reserved for Walsh McDermott, M.D., Kurt W. Deuschle, M.D., and John Adair.

2 Bernard Haile, Soul concepts of the Navaho, Annali Lateranensi 7.70 (1945). 368
Island in the Philippines, because they designate states of succulence and desiccation (whether of the body as well as of vegetation we do not know) with color terms. In some contexts mararaq means 'exhibiting redness' and malatuy means 'exhibiting greenness', while in other contexts mararaq means 'dehydrated, dry' and malatuy means 'succulent, moist'. A wetness-dryness opposition lends ambiguity to Hanunóo color classification.  

Conklin has done more than discover an interesting terminological ambiguity among the members of a remote Philippine tribe; he has done more than give specific illustration of what for some linguists, anthropologists and psychologists has become a platitude about the lack of congruity between form and content. His work is distinguished by attentiveness to substitutional privileges on the semantic plane, to different levels of abstraction open to people when they talk about colors. His approach justifies review.

2. We assemble here from various parts of Conklin's work Hanunóo terms and translations. These translations, no less than those used for Zuni and Navaho terms, are vital as glosses or tags, but are poor approximations to meanings or classifications of experience, as they function in a culture.

The prefix ma- 'exhibiting, having' occurs with bi-ru, lagitig, raraq and latuy. Translations of bi-ru are 'relative darkness (or shade of color); blackness; black, violet, indigo, blue, dark green, dark gray, and deep shades of other colors and mixtures; (with manufactured items, trade goods, and some natural products) deep, unfading, indelible, more desired character'. Translations of lagitig are 'relative lightness (or tint of color); whiteness; white and very light tints of other colors and mixtures; (with manufactured items, trade goods, and some natural products) pale, weak, faded, bleached, 'colorless' character'. Translations of raraq are 'relative presence of red; redness; maroon, red, orange-red, orange, yellow, and mixtures in which these qualities are seen to predominate; dryness, desiccation; (with manufactured items, trade goods, and some natural products) deep, unfading, indelible, more desired character'. Translations of latuy are 'relative presence of light greenness; greenness; green, light green, and mixtures of green, yellow, and light brown; wetness, freshness, succulence; (with manufactured items, trade goods, and some natural products) pale, weak, faded, bleached, 'colorless' character'.

Conklin classified color-oriented Hanunóo linguistic responses to painted cards, dyed fabrics, and other prepared materials according to distinctions on two levels, those of mabi-ru, malagtitg, mararaq, and malatuy on Level I, and all other distinctions on Level II but susceptible of reclassification into one of the four basic color realms. Level II terminology is marked by delimitation, with words or phrases, of spectral loci lacking the extension of the loci at Level I.

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1 See Harold C. Conklin, Hanunóo color categories, *Southwestern Journal of Anthropology* 11:330–344 (1955); cf. (342): 'A shiny, wet, brown-colored section of newly-cut bamboo is malatuy (not mararaq). Dried-out or matured plant material such as certain kinds of yellowed bamboo or hardened kernels of mature or parched corn are mararaq.' (The orthography which we have used here is that of Conklin, *Linguistic Play in its Cultural Setting*, p. 36.65–66 (1959), where t rather than q represents the glottal catch, and a raised dot serves instead of a macron.)
was truly amazing. In English, orange and yellow are the most sharply defined color-categories, and, accordingly, their foci scored highest in recognition by Americans. But monolingual Zunis do not distinguish at all between orange and yellow. The entire region is occupied by a single category. It is striking that not a single monolingual Zuni recognized correctly either orange or yellow, thus completely bearing out the expectations based on the hypothesis.\footnote{For a report on Southwest Project color data collected from Navajo subjects, see Susan M. Ervin, Semantic shift in bilingualism, \textit{The journal of psychology} (in press).}

While Southwest Project color experimentation among the Navaho was directed primarily at exploration of psychological phenomena, data of lexicographic value also came to hand.

4. Substitutional privileges such as those described by Conklin for Hanunóo colors are as universal as abstraction. If one can say, for example, that \textit{tangerine}

\footnote{For a transcription of sections of a tape recording made with a monolingual Navaho during Horowitz’s work at Shiprock, N. M., see Landar, The Navaho intonational system, \textit{Anthropological linguistics} 1:9.11–19, \textit{§2} (1959). One of these tape sections, \textit{§2.3}, involves directive eliciting of color terminology. The tape recording is available through the Archives of Languages of the World, Indiana University.}

\footnote{Eric H. Lenneberg and John M. Roberts, \textit{The language of experience, A study in methodology} 20–21, IUPAL Memoir 13 (Supplement to \textit{IJAL} 22, 1960).}


\footnote{Lenneberg and Roberts 31.}
is a shade of orange, but not every shade of orange is tangerine, one proves the existence of Levels I and II for English. In terms of substitutional privileges, Navaho color responses also belong on two levels. On the most generalized level (Level I), we have: tséí tsi³ 'it is red'; tse 'it is yellow; it is orange'; tsí tsi³ 'it is blue; it is green; it is purple'; tsé 'it is gray'; tsóéí 'it is white'; tseí 'it is black.'

On the more specific level (Level II), variations along the dimensions of brightness, saturation, and hue are indicated by prefixation, cf. tseí 'it is red', diní 'it is reddish; it is light red or pink', and by qualification involving several words, cf. tsóglis 'it is whitish', doo kíí 'it is bogop', doo kíí 'it is whitish bogop'.

5. The list of Navaho color expressions which follows shows the diversity of usage of five subjects (A, B, C, D, E) responding to a particular color, whose chip number is given in boldface.

1. diholó tsi³ 'it is light red' A 1
2. diholó tsi³ 'the light red one' B 1

4 The orthography is that used by Harry Hoijer in The chronology of the Athapaskan languages, LAL 23.219–32 (1956), with some exceptions. We have indicated nasalization by a hook rather than by raised n. Since [u] is not in free variation with [o] and contrasts with [o] in analogous environments (cf. /'su/ 'sun' /'yes'/ 'yoo' /'bead'), and since we have found some minimal pairs with /o/ (cf. /'a'-'oos/'one's shoulder', /'a'-'oos/'one's aorta', /'a'-'oos/'my shoulder', /'a'-'oos/'my aorta') we recognize two phonemes which are not included in Hoijer, Navaho phonology §18 (Albuquerque, 1945), a high back vowel /u/ and a mid central vowel /o/.

8 An ‘adjective’ category, which some speakers of English might expect, does not exist; Sapir made this clear in A type of Athabaskan relative, IJAL 2.156–57 (1921–23). Navaho Level I terms are predicational forms.

10 We use acronyms hereafter as glosses: yoo for ‘yellow or orange’, and bogop for ‘blush-or-green-or-purple’. These acronyms dramatize the disparity between English and Navaho color dimensions, and also impart some measure of psychological reality to the Navaho concepts. It is hoped that their convenience will win tolerance for these coinages.

11 The variant tsóéí occurs at least in ceremonial contexts; perhaps it shows regressive vocalic assimilation—the Proto-Athapaskan prefix was *tsi³, possibly meaning ‘inherent quality’.

12 Beaverboard, coffee, or reddish-brown skin (as of an Indian) are referred to as yiíkí tsi³ ‘it is brown’. In reference to a reddish-brown horse (e.g. a bay horse, with reddish-brown body hair and black mane, tail, and shanks), however, one says tsi³ tsi³ ‘it is red’; and in reference to a horse which is predominantly mouse-gray in color, one says tsi³ tsi³ tsi³ ‘it is gray’. Grimy or dirty skin, regardless of basic skin color, may be described as yiíkí tsi³, though tsi³ tsi³ is more commonly used in this connection, metaphorically. In some but not all cases, then, yiíkí tsi³ belongs on Level I.

On fluctuation of tsi³ and díní, see §6.2.

13 Also frequent are díní doo kíí ‘it is light bogop; it is bogopish’; díní doo kíí ‘it is whitish’; díní doo kíí ‘it is light gray; it is grayish’; díní doo kíí ‘it is black-gray; it is dark in color, not too black; it is almost black, or very dark in color’; díní doo kíí ‘it is yoonish; it.is light yoo’.

14 The second word is the enclitic go ‘being thus’; a variant o occurs in colloquial speech. (In this article, particles which are irreducible ICs are counted as words, like the enclitic go.)

15 Each Munsell-Farnsworth color chip was set in a black bottle cap with a flashlight face, and was protected by acetate. The chip, then, could be regarded as an object per se. When this happened, relative enclitcs appeared, particularly t, t and t, and t ‘the one (who or which . . .)’: díní doo kíí ‘it is light bogop’, díní doo kíí ‘the one which is light bogop’. Before t or t, a verb stem of the shape -CV³C has an alternant -CV³C. Before go ‘being thus’ the alternant is -CV³C (cf. 19).
3. Ḳeqeq?
4. ṭáō yěi o ḷǐtǐtǐ?
5. ṭóō ḷǐtǐtǐ lā
6. cin bee yiśiśiśi?
7. ḷǐtǐtǐ? ṭiqti
8. Ḳeqeq?
9. ṭáō ṭiqti yěi o ḷǐtǐtǐ?

'it is red' C 1
'it is just intense light red' D 1
'it is sort of light red, I find' E 1
'they dyed it red with wood' A 4
'the light red one' B 4
'it is red' C 4
'it looks like a very intense red' D 4

nahalin

10. ḷǐtǐtǐ?
11. ḷǐtǐtǐ? nahalin
12. ḷǐtǐtǐ? nahalin
13. Ḳeqeq?
14. ḷǐtǐtǐ?
15. ḷǐtǐtǐ? nahalin ḷǐtǐtǐ?
16. Ḳeqeq?
17. yiśiśiśi

'it is light red' E 4
'it looks like sheep red' A 7
'it is light yoo' B 7
'it is yoo' C 7
'it is light red' D 7
'it is red like sheep red' A 10
'the yoo one' B 10
'it is dirty gray; it is shiny, greasy, grayish brown, with luster (as the color of certain horses)' C 10

18. Ḳeqeq? nahalin ḷǐtǐtǐ?
19. ḷǐtǐtǐ? go lōō
20. Ḳeqeq i yee?
21. ṭáō yěi go ḷǐtǐtǐ?
22. Ḳeqeq?
23. ṭóō lōō nahalin ḷǐtǐtǐ?
24. ṭáō ṭóō ṭiqti yiśiśiśi ḷǐtǐtǐ
25. cin bee yiśiśiśi
26. Ḳeqeq i yiqti
27. Ḳeqeq?
28. Ḳeqeq lā
29. ḷǐtǐtǐ? go ṭóō lōō ṭiqtiq?

'it is light red like yoo; it is yooish reddish' D 10
'it is gray, being light red; it is reddish gray' E 10
'really a light yoo one' A 13
'it is just about intense light yoo' B 13
'it is yoo' C 13
'it is light red sort of like gray' D 13
'that is grayish, sort of remarkably brown' E 13
'they dyed it yoo with wood' A 16
'the yoo one' B 16
'it is yoo' C 16
'it is yoo, I find' D 16
'it is sort of gray, being light yoo also; it is yooish gray' E 16

18 ṭáō 'just, about'; yěi 'hard, intense'; o 'being thus'; cf. ṭáō ṭiqti qś it is just much', five expressions down (9).
19 ṭóō 'just, merely, sort of'; lā 'I find'.
18 cin 'wood'; bee 'with it'; yiśiśiśi 'they dyed it red'.
19 nahalin 'it looks like it', as in ḷǐtǐtǐ? nahalin 'it looks like sheep red' (11); cf. nahalin 'it is like it'.
20 ḷǐtǐtǐ? 'it is sheep red' is derived from ḷǐtǐ 'sheep' plus ṭiqti 'it is red'. Some sheep are this color, a ruddy blend of black and red.
21 yee? 'really, emphatically'.
22 ṭáō is a colloquial variant of ṭáō 'just'; cf. ṭóō beside ṭóō 'sort of'.
23 ṭáō 'that'; ṭóō, also ṭóō, 'remarkably, very'.
24 yiśiśiśi 'they (or he, she, or it) colored it yoo'. Cf. fn. 18; reference is made to vegetable dyes, so called, used for example in preparing yarn for Navaho rugs.
25 ṭiqtiq? 'also, too'.
30. cín bee yé'iyi’iní’i’í “they dyed it red with wood”  A 19
31. ?dá yé’í go diñłcí’i “it is just intense light yoo”  B 19
32. tico “it is yoo”  C 19
33. ?é’i’t óó lebdá nahaló dóó diñłbdá “that is sort of like gray and it is light gray; that is sort of gray like light gray” D 19
34. diñłbdá go dóó lebdá “it is gray and it is thus, light yoo”  E 19
35. dinoolx’í’í tóó yee? dóó diñlooh í yee? “the really light bogop and really light yoo one”  A 22
36. yiishí’í tóó “the brown one”  B 22
37. tico “it is yoo”  C 22
38. x’oh diñldá nahaló dinoolx’í’í “it is light bogop like grayish grass”  D 22
39. k’asáá’q? líco tóó náá diñldá “it is almost yoo, sort of light gray again”  E 22
40. ci’il dadoolx’í’í tóó nahalin “it looks like the ones which are bogop plants”  A 25
41. yiishí’í tóó “the brown one”  B 25
42. tico “it is yoo”  C 25
43. tóó líco nahaló dinoolx’í’í “it is light bogop sort of like yoo; it is bogopish but with a little yoo”  D 25
44. dinoolx’í’í o tóó diñldá “being light bogop, it is sort of light gray”  E 25
45. x’oh liicoh í nahaló dovóx’í’í “it is bogop like hay”  A 28
46. tak’id tóó “the green one”  B 28
47. dovóx’í’í “it is bogop”  C 28
48. tak’id’é lhógh tóó nahaló “it is like one which is grayish green”  D 28
49. ?dá yóó diñldá—dovóx’í’í go ?al- do? tóó diñldá “it is just a bit (gray?)ish—being bogop it is also sort of gray-ish”  E 28
50. ci’il bit’iqw” nahaló dovóx’í’í “it is bogop like a plant leaf”  A 31
51. dáx’id tóó “the green one”  B 31
52. dovóx’í’í “it is bogop”  C 31
53. tóó tóóqai go dox’óx’í’í “being sort of white, it is bogop”  D 31

36 dóó ‘and’.
37 X’oh ‘grass’; diñłbdá ‘it is grayish or light gray’.
38 Reference is made to color 49, which E had seen just before seeing color 23; k’asáá’q? ‘almost’; náá ‘again’.
39 da- ‘severally’.
40 X’oh liicoh í is a relative expression, ‘the one which is yoo grass; hay’.
41 tóó ‘water’; X’id ‘be bogop’; ‘it is moss or algae green; it is water-scum green’—some Navahos will not use the word dóó diñldá in polite conversation, because X’id means ‘fart’ when used as a noun.
42 ?dá yóó, like tóó binyá, means ‘just a bit’.
43 Ci’il ‘plant’; bit’iqw” ‘its leaf’.

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54. ṭddá ṭdd yóó ṭdd diišin 'it is just a trifle short of darkish' E 31
   ḏoox'íł 'bogop'
55. ḳooh ḳooh ᵐ naḥalín 'it looks like hay' A 34
56. ṭdd'íł ṭgil 'the green one' B 34
57. ḏoox'íł 'it is bogop' C 34
58. ṭdd'íł ṭgišiši yéi go diišiši ḏoox'íł 'it is very intense light bogop' D 34
59. ḏoox'íł ṭdd yóó ḳoób 'it is bogop sort of gray' E 34
60. ḏoox'íšši naḥaló ḏoox'íł 'it is bogop like turquoise' A 37
61. ṭdd'íł ṭgil 'the green one' B 37
62. ḏoox'íł 'it is bogop' C 37
63. ṭdd náá biiš'i? ṭayáñu dìiníł ... náá diišiši ḏoox'íł 'just about that way again it is quite ... it is light bogop again' 34
   35
64. ḏoox'íł ṭdd yóó ḳoób 'it is bogop sort of gray' E 37
65. ḳooh naḥaló ḏoox'íž 'it is bogop like grass' A 40
66. ḏoox'ížiši naḥalín 'it looks like turquoise' B 40
67. ḏoox'íž 'it is bogop' C 40
68. ṭdd'íł ṭgišiši yéi o ṭdd'íł ḏoox'ížiši ṭgil 'the one which is just a very intense green bogop' D 40
69. ḏoox'íž o dìišáá 'being bogop, it is light gray' E 40
70. ḏoox'ížiši naḥaló ḏoox'íž 'it is bogop like turquoise' A 43
71. ḏoox'ížiši naḥalín ṭgil 'the one which is like turquoise' B 43
72. ḏoox'íž 'it is bogop' C 43
73. ṭdd'íł ṭdd yóó biitza? ṭgil ṭgil ṭdíl o naḥalín diišiši ḏoox'íži 'it looks like the one which is just a little bit between them, being light bogop' 34
   35
74. ḏoox'íž go ṭdd yóó ḳoób 'being bogop, it is sort of gray' E 43
75. ḏoox'ížiši naḥaló ḏoox'íž 'it is bogop like turquoise' A 46
76. ḏoox'ížiši naḥalín ṭgil 'the one which looks like turquoise' B 46
77. ḏoox'íž 'it is bogop' C 46
78. ṭdd náá biitza? ṭgil yóó o náá diišiši ḏoox'íži 'it being just again the one which is a shade beyond it in intensity, it is again light bogop' 37
   38
79. ḏoox'íž o ṭdd yóó ḳoób 'being bogop, it is sort of gray' E 46

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34 The form ḏoox'ížiši 'turquoise' is a noun derived from ḏoox'íž 'it is bogop' plus the relative enclitic ṭgil 'the one (who or which ...). We test a form to determine if it is a noun or a relative expression by asking whether or not an IC can be inserted between the enclitic and what precedes it in its constituent; if it can, we have a relative expression, if not, a noun: ṭgil 'the particular horse' is a relative expression, since one can say for example ṭgil? 2 ḫah 3 ḥišiši ṭgil 'the horse that got away' (numerals show rank of IC cut; ḫah ḥišiši means he ran off'); but ḫišiši 'bluebird' is a noun, since the form cannot be expanded (cf. ḏoox'ížiši naḥalín ḏoox'íži, cranberry; ḥišiši, 'bluebird').

35 Reference is made to color 35, which D had seen just before seeing color 37; biitza? 'toward it'.

36 biitza? 'between them'; ṭdíl 'it is thus'.

37 Reference is made to color 34, which D had seen just before seeing color 46; biitza 'over it, above it; a shade beyond it'.
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<td>81. doock'ii hi nahalin t'lohi</td>
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<td>being sort of light gray, it is bogop</td>
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<td>turquoise like the sky</td>
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<td>it is gray like ashes</td>
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<td>'the gray one'</td>
<td>B 61</td>
</tr>
<tr>
<td>102. doock'ii</td>
<td>it is bogop</td>
<td>C 61</td>
</tr>
<tr>
<td>103. tóóba go t'óleééí t'óó lebá</td>
<td>'being gray, it is just barely bogop'</td>
<td>D 61</td>
</tr>
<tr>
<td>104. t'áá t'óleééí t'óó lebá o díinoolki'í go t'óó lebá</td>
<td>'being just barely light bogop, it is sort of gray'</td>
<td>E 61</td>
</tr>
<tr>
<td>105. tóóba o doock'ii</td>
<td>'being gray, it is bogop'</td>
<td>A 64</td>
</tr>
<tr>
<td>106. waa' bídéézá ±</td>
<td>(the color of) beeweed flowers</td>
<td>B 64</td>
</tr>
<tr>
<td>107. doock'ii</td>
<td>'it is bogop'</td>
<td>C 64</td>
</tr>
<tr>
<td>108. t'éétí t'éétí t'óó lebá nahalíin</td>
<td>'that looks like it is sort of gray'</td>
<td>D 64</td>
</tr>
<tr>
<td>109. díílingai go t'óó lebá ?aló?</td>
<td>'being whitish, it is sort of gray too'</td>
<td>E 64</td>
</tr>
</tbody>
</table>

100. coléédcéédíh | 'purple four o'clock (Mirabilis)' | A 67 |

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38 wóógh 'fairly'; hóó 'though'.
39 t'éétí t'óísíís 'it is just much'; t'áá yétí o 'just intensely'.
40 t'éétí 'only'.
41 leeh'íhih 'ashes'.
42 t'óleééí 'it is little; just barely'.
43 waa' 'beeweed, Cleome pandens'; bídéézá 'its flowers'.
44 t'éétí 'that', repeated for emphasis.
111. waa? biltaah t
112. dool'iz
113. 'dlee'is go tooba nahalin
114. dool'iz dhiigaay
115. ceddeeth nahalo dool'iz

116. waa? biltaah t
117. dool'iz
118. "ti'oo dii'ees" la ti'ihii go

119. dii'ees? go 'daa yoo dhiigaay go
    ti'oo toob
120. ceddeeth nahalo hii"ih?
121. dii'ees? iyii
122. hii"ih?
123. ti'ihii go yee' dii'ees?
124. 'daa 'dlee'is go dii'ees? go
    ti'oo toob
125. dii'ees?
126. waa? biltaah t
127. hii"ih?
128. 'ti'oo dii'ees?
129. dii'ees? go ti'oo toob
130. cin bee giyii'eesii?
131. dii'ees? iyii
132. dii'ees?
133. dii'ees? la
134. 'ti'oo dii'ees?
135. dii'ees?
136. dii'ees? iyii
137. hii"ih?
138. 'ti'oo kico nahalo dii'ees?
139. 'daa nda dii'ees?
140. dii'ees?
141. dii'ees? iyii
142. hii"ih?
143. 'daa yee' go dii'ees? la

144. dii'ees?

'beeweed flowers' B 67
'it is bogop' C 67
'it just barely looks like gray' D 67
'it is whitish bogop' E 67
'it is bogop like purple four o'clock' A 70
'beeweed flowers' B 70
'it is bogop' C 70
'that is sort of pink, I find, slightly' D 70

'being light red, being just a bit whitish, it is sort of gray' E 70
'it is red like purple four o'clock' A 73
'the one which is light red' B 73
'it is red' C 73
'it is very slightly light red' D 73
'being just barely light red, it is sort of gray' E 73
'it is light red' A 76
'beeweed flowers' B 76
'it is red' C 76
'it is sort of light red' D 76
'being light red, it is sort of gray' E 76
'they have dyed it red with wood' A 79
'the light red one' B 79
'it is light red' C 79
'it is light red, I find' D 79
'it is sort of light red' E 79
'it is light red' A 82
'the light red one' B 82
'it is red' C 82
'it is light red like a sort of yoo' D 82
'it is just light red again' E 82
'it is light red' A 86
'the light red one' B 85
'it is red' C 85
'it is just intensely light red, I find' D 85

'it is light red' E 85

6. These linguistic forms were collected in a process initiated by our obtaining a set of 29 Munsell color chips, for a procedure admittedly less elaborate than that suggested by Lenneberg and Roberts, but suited to our economic and

45 'ti'ihii 'a tribe, slight bit'; 'ti'ihii is a variant (see 123).
46 D uses both 'ti'ihii (see 118) and 'ti'ihii. Informants say these forms have the same meaning.
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temporal limitations. Instructions for the identification of the Munsell colors were taped.\(^46\)

dít ko dóó dóó doó látalást ‘alqáq t'udadole’ é yidshéézh go t'el’é’ kóshóshii dít ciqg bii? 
áá. ‘dák dóó dítalást’ bii, ‘dák dóó ditéhé bii kóshóshii yidshéézh dooleel. ’éél 
héél yinágáq go ‘bél t'elé’ nánísh dooleel. doo’i yinágáq go dóó doo’i doo. 
‘dák dóó dít ‘bél t'bólshé. ’éél dít ciqg go do go ‘bél t'áá bii yidshéézh bii yidshéézh 
wiye, go do go. ’éél t'dá biqołó bii néizé, go do go. ’éél t’áá 
héół chééshhini t'elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t'elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 
héół chééshhini t’elé bii náhóóyéé bii héół chééshhini t’elé bii náhóóyéé bii héół 

‘Now you will be shown several different things which are colored through 
this window. And you look at them and as soon as you see them tell me the 

color of them. If you see red you will say “red”. If you see bogop it will be 
“bogop”. And give a name to each color. And if you have a long name for any 
one of them give me the one that you would say to someone you know. And give 
me the color as quickly as possible. I want you to name these for me as soon as 
you see them. Use your everyday language when you give these names.’

These instructions were played and the color chips were presented to subjects 
by Ervin and Horowitz,\(^49\) while a tape recording was made of the responses. 
Landar transcribed the taped data with the help of various informants; generally 
the informant listened to a response, dictated it, and translated it. The color 
material was recorded as part of a sequence of activities with each subject, and 
its collection was therefore relatively economical. The collected terms were then 
reviewed with informants, in 1956 and 1959-60, for supplementary semantic 
and formal data, presented below as notes.

6.1. There is no generic term for ‘color’. In eliciting a description of the color 
of an object, one asks how an object has been painted, or one asks for a description 
and poses alternatives: hoo yité, tico da, dool’i bii ‘how is it, you for 
example, or bogop?’. (The word ‘color’ in the translation above is gratuitous.)

6.2. Two stems for ‘black’ are in complementary fluctuation, -sin and -xil; 
cf. lišin ‘it is black; it is grayish or brownish or yellowish black’ and dikil ‘it is 
black (as it can be, like charcoal); it is dark (as some mountains, or the atmos-
phere in bad weather)’. The phrase dikil go ‘being very dark’ qualifies value, 
as in dikil go dool’i ‘very dark bogop’.\(^50\)

6.3. Relative expressions which indicate variation in the tinting or hue of any 
particular color are bee Tilídl ‘the made-red-with-it one; bee Tilíbí ‘the 
made-black-with-it one; bee Tilgah ‘the made-white-with-it one’; cf. bee 
Tilíd’i télsh’i yéél ‘the particular one which is green with red coloring’; bee 
Tilíd’i dool’i yéél ‘the particular one which is bogop with red coloring’; ci’el 
‘plant’, č’i’ bee Tilídl ‘a plant with red coloring’; lace ‘earth’, lace bee Tilíbd’i 
‘earth with (mineral) red coloring’.

\(^46\) A translation from English to Navaho by one informant was transcribed and back-
translated with another informant, as a check, before the instruction tapeing was used.

\(^49\) Ervin and Horowitz at Fort Defiance, Arizona; Horowitz also at Shiprock, N. M.

\(^50\) Cf. dínalshin, fn. 13, and the use of yilshé and lišin in regard to dirty skin, fn. 12.

Negroes and persons with a gray cast to the complexion (some Indians of India, for example) 
are classified as naaski lišin ‘the ones who are black Mexicans’. 
6.4. Transformations of natural colors in the visual field, as by wearing tinted glasses, are indicated by the adjectival (or 'postposition') /bɪyd/ 'through it' with appropriate verbal forms; cf. /bɪyd di'ničii/ go dinoolə'ziɣ 'it is light bogop, being thus: it looks red through it'.

6.5. The prefix complexes /dinil-/ (di'ni-) and /dinool- indicate lightness of value, or approximation to a focal hue on Level I; exact nuances of meaning have not been determined. Compare -gai 'be white', /dinilgai/ 'it is white; it is sort of white', /dinoolgai/ 'it is sort of white; it is on the white side'; -ko 'be yoo', di'kîco 'it is light yoo; it is yooish', di'kîkoqo 6 yee 'it is a pale yoo one'.

6.6. The terms /ko 'it is yoo', /kîcî 'the yellow one (wool, sand for ceremonial painting)', /kîcî 'the orange one (fruit, Citrus sinensis); bile (as seen in vomitus)' and /kîcîqî 'the particular yoo one' show that with certain nouns and relative expressions ambiguity as to range of hue is curtailed through semantic specialization.

6.7. Colored striping, natural or geometrical—on a chipmunk, say, or forming lines or squares on a shirt—is indicated by /nedoqoqo 'it is striped; it has colored lines or bars'. A scattering or profusion of freckles, or of spots as on a dalmatian dog, is indicated by /yipla'nin 'it is freckled with spots'. Irregularly spotted marks or areas regardless of size, as on the face of a child with measles or on a pinto pony, are indicated by /likiš 'it is spotted' (cf. bee 'with it', likiš? 1 bee 2 likiš 'it is spotted with red'). A sparkling effect, as of a twinkling star, is indicated by /diisqoqo 'it is sparkling'; this sparkle differs from the shine of a glittering or shining object, which is denoted by the stem /-di/on 'shine, produce light' (žôhonasa?et /-adindílen 'the sun is shining') or by the stem /-dîł/ 'glitter as a reflection in the distance'.

6.8. Verbs, including those relating to colors, are conjugated in a variety of paradigms. A neuter paradigm, for example, exists for the stem -co 'be yoo', some members of which are /tinisqo/ 'I am yoo', /tinico/ 'you (sg.) are yoo', /tiço/ 'he, she, it is yoo; they are yoo', /tiço/ 'one [distant] is yoo' /tiinisco/ 'we two are yoo' /tihoqoqo/ 'you two are yoo', /hálaqoqo/ 'a place is yoo', and /daalco/ 'they (as individuals) are yoo'; similarly, future, imperfective, perfective, iterative, and optative paradigms exist respectively for the stems -co (yidoqoqo 'he will color it yoo'), -cóoh (yitóqoqo 'he colors it yoo'), -cóoi (yítiqoqo 'he colored yoo'), -cóh (ndaqoqoqo 'he colors it yoo now and then'), -cóoh (yóqoqoqo 'I wish he would color it yoo'); compare also these same stems with different prefix complexes, for 'become or turn yoo': /yóqoqoqo/ 'I shall turn yoo', /yitoqoqo 'he turns yoo; we two turn yoo', /yíqoqoqo 'you (sg.) turned yoo', /biqutqoqo 'his skin turned yoo', /niqoqoqo 'I turn yoo now and then', /yóqoqoqo 'I wish you (sg.) would turn yoo'.

Stems relating to colors also include -liš, -læq, -líq, -léq, -læq 'smear on white clay; paint' (cf. e.g. /léqoqoqo 'I painted it', nd?læq 'he paints, now and then');
-\(E^h \), -\(E^h q\), -\(E^h q\), -\(E^h q\) 'decorate, embellish, design, draw, paint, engrave' (\(A^hE^h q\) 'I decorated it', \(A^hE^h E^h q\) 'I decorated something; I painted a picture'), -\(E^h i\), \(E^h t\), -\(E^h i\) (\(-\(A^h t\), \(-\(A^h i\)), \(-\(A^h i\), \(-\(A^h t\) 'be bogop' (\(B^h i\) \(D^h A^h t\) 'his belly became bogop', \(D^h i\) \(A^h t\) \(A^h t\) 'he dyed it bogop'); -\(A^h\), -\(A^h\), -\(A^h\) 'be red' (\(A^h t\) 'it became red', \(D^h A^h t\) \(A^h t\) 'I reddened my lips', \(D^h i\) \(A^h t\) \(A^h t\) 'we two are red', \(D^h i\) \(A^h t\) 'it gets red now and then', \(D^h i\) \(A^h t\) 'might I color it red'); -\(A^h\), -\(A^h\), -\(A^h\) (\(A^h t\)), -\(A^h\), -\(A^h\) 'be white' (\(A^h t\) \(E^h t\) 'it will get white', \(A^h t\) \(E^h t\) 'it got white', \(A^h t\) \(E^h t\) 'it gets white now and then', \(E^h t\) \(E^h t\) \(E^h t\) 'you two are white', \(E^h t\) \(E^h t\) 'I made it white'); -\(E^h\), -\(E^h\), -\(E^h\), -\(E^h\) 'color black' (\(A^h t\) 'I made it black'); -\(E^h\), -\(E^h\) (\(-\(E^h E^h\), -\(E^h\), -\(E^h\), -\(E^h\) 'be black' (\(A^h t\) 'he became black', \(D^h i\) \(A^h t\) 'I am dark brown', \(D^h i\) \(A^h t\) 'I am black', \(D^h i\) \(A^h t\) 'it became dusk').

7. These data, assembled after the use of Munsell color chips and supplementary field work, do not exhaustively categorize Navaho color space; Lenneberg and Roberts have set the minimum number of perceptually equidistant colors to be used in such an enterprise at 500, not 29.14 It has been possible, however, to contrast the probability structures of monolingual Navaho and English color references; see Figure 1. Our data are valuable not simply because they have enabled us to construct probability curves. Navaho terms have now been tied to standard colors whose psychophysical properties are a matter of record.15 The 29 chips served to elicit all of the Level I expressions and the commonest of the Level II expressions, with relatively little expenditure of money or time. Because of metaphors (\(D^h i\) \(D^h A^h t\) 'your face is black') and specialized references (\(D^h i\) \(D^h A^h t\) 'a gray horse', but \(D^h i\) \(D^h A^h t\) 'it is brown'), we doubt whether directive eliciting with standard colorimetric materials can provide much beyond a preliminary reckoning of color categories. But this reckoning is a basic step in sensitive lexicographic work. Moreover, the data have contributed to an awareness of the consistency with which certain Navahos categorize colors at a given level of abstraction—compare, for example, the diligent favoring of Level I distinctions by C with the equally diligent favoring of Level II distinctions by D.

Disparities, one must conclude, are inherent in color categorization. Whence do they spring? Hanunoo, Zuni, and Navaho evidence suggests that color categories are structured differently from culture to culture; bilingual speakers, because of semantic shifts, have different categories than those of monolingual speakers, as the Zuni and Navaho researches of Lenneberg, Roberts, and Ervin have demonstrated; within particular cultural horizons, individual categorizations fluctuate and are not always congruent; and some speakers, to compound confusion, favor a broad level of abstraction in categorizing colors. At this point,

13 Said of the swollen, vein-covered abdomen of a starving Indian, the veins appearing blue-green against the skin.
14 Now see Berard Halle, Legend of the Ghostway ritual in the male branch of Shootingway 219–224 (1960), with fold-out plate opposite page 224, for a detailed Navaho description of a colorful sandpainting, together with an English interlinear translation and a connected text.
16 For details, see Ervin, loc.cit.
we dramatize some disparities from clinical records, to lead final irony to the thought from Wittgenstein with which we began.

7.1. Three interpreters were asked to translate a description of the common cold. In dealing with the words 'a watery nasal discharge which becomes thicker and yellow-gray in color', one interpreter said, 't'go d'ii'ch go, nii'gil go do'dó ticzo go haahidéézh yi'leezh tíí ... t'ii'idéé haané'éétil da t'okó't'ee go t'óó bitó doko'ii'zh nahnalín go haahidéézh yi'leezh. 'Being sort of stringy and watery, being thickened stiffer, and being nasty yoo, it comes out as a mushy mass, they say ... Finally, usually one blows out one's nasal mucus, for example, being that way, being just a bit like bogop.' Another said, hané'éétil da nii'gilí'ii bizí, yi'love léélí'ó dá unchanged t'óó dí'ch nahnalín yi'leezh, t'óó bío dico go tabó nahnalín go 'One's nasal water, for example, starts dripping around, they say. Soon it becomes sort of stringy and watery, being rather nasty yoo, being like gray.' The third said, t'óó ticzo da náleech, t'ééda doko'ii'zh da yi'leezh 'Now and again it becomes say sort of nasty yoo, then it becomes bogop for example.' In the last case, two Level I distinctions (yoo, bogop) replaced one Level II distinction (yellow-gray), with a temporal distortion.

7.2. If carelessness, misunderstanding, or independence are barriers to communication, so too is the lack of a generic term for color, when coupled with vague questioning. Here is part of a medical interview:

Doctor. Do you spit?

Interpreter. 'yoo, haahidéézh éí? [Uh, do you spit out time after time?]

Patient. 'yuu'. [Yes.]

Int. Yes.

Doc. Mostly in the morning or just any time?

Int. 'yabín go dí'éíyé ná? [He says, is it only in the morning?]

Pt. 'yabín go t'iyíg dákóná'ílí, 'yuu'. [Only in the morning it happens now and again like that, yes.]

Int. 'yá díó ñíí go 'yá dìí dìí 'dít'íi da, dìí 'dánt'íi da. [Then during the day it doesn't do that, you don't do it.]

Pt. 'yuu'. [Yes.]

Int. Just in the morning.

Doc. What is the color of the spit?

Int. 'yá ko 'yáq? dìí yit'é ná? [I'd like to know then, how is it, he says.]

Pt. dìí ko dí né'ít'íilti ití? t'óó r'ahayít leh. [This particular nasal mucus up in here, usually there is just lots of it.]

Int. niné'éétil ití? [Mucus in your nose?]

Pt. 'yuu'. [Yes.]

Int. 'yá ko óó haahidéézh? [Then do you haul it out (as mushy matter)?]

Pt. 'yuu'. [Yes.]

Int. He said there is a lot of stuff in his nose and he has to blow it.

Doc. What color is it?

Int. dán yi'lee leh 'yá dìí haahidéézh go àl, niné'éétil ití? haahidéézh go da? [How

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7 Kindly provided by John Adair.

8 The -éé gives the stem -cër augmentative-pejorative meaning, and has been rendered as 'nasty'; cf. bitó? 'it is nasty red', as in handá? da t'óó bío dıcí? yitée 'one's eyes, for example, become a rather nasty red'. (On -éé, see Gladys A. Reichard, Navaho grammar 141-2 [1951].)
is it usually, either what you spit out time after time, or your nasal mucus which you haul out (as a load) time after time?

Pt. ṯeʾiščí tseq ṭé hiicxo leḥ. ṭeʾiščí go dí bicaakší. leḥ. [The nasal mucus, that’s usually nasty yoo; usually a little blood is red within it.]

Int. doo ḏe ninya? ḏeʾiščí ḏe? [Is your nose not sore inside?]  
Pt. ṭeʾiščí yoo, ḏooy ṭeʾiščí ḏa. [Yes, it is not.]

Int. ṭeʾiščí tseq ṭeʾiščí ṭé haa yiṭ’é leḥ, hahideeh ṭeʾiščí. [What about your particular spit, how is that usually, you being the one who spits out time after time?]

Pt. ṭé ḏakší ṭé ḏakší. ḏá bico yicxo nahalin. [That too is just the same. It looks kind of like nasty yoo.]

Int. His spit is kind of yellowish in color and also from the nose and usually there is some blood in it.

8. A word of retrospect and prospect. Expectations that color ranges are about the same across languages are more prevalent than empirically justified. One does not doubt the accuracy of Haile’s remarks about colors associated with cardinal directions; but one is frustrated by a high level of abstraction—dox’i’z is not ‘blue’ and hic is not ‘yellow’ pure and simple, and one wonders if the colors of sandstone powder used in representing the supernatural in sandpaintings have not influenced Haile in his translation of these Level I color words. His glosses leave an area of doubt.

Even the words yoo and bogop invite caution, since they can push one into an etymological pitfall. These acronyms refer to the Navaho color ranges, not the English. Not all of what a speaker of English calls orange, for example, is designated by yoo; the boundary between tišt’i and hic probably occurs between red-orange and everything yellower. Similarly, tại, though commonly translated as ‘it is gray’, sports strong connotations of lavender and might be used as a translational equivalent of purple in preference to doox’i’z.

The use of standardized colorimetric materials for lexicographic explorations should, we think, be considered by field researchers; one can sample the entire hue circuit economically by using color chips from the Farnsworth-Munsell 100 Hue Test, as we did, using a subset in which all chips have the same saturation and brightness, and differ only in hue by perceptually equidistant steps. (Test item numbers, represented above in boldface, are not the general Munsell numbers, which are very complicated.) The larger Lenneberg and Roberts mapping method permits differentiation on other dimensions than hue; the chip subset will not elicit the full range of Level II terminology describing differences of brightness or saturation. But it is a good set to use in exploring for descriptive or comparative purposes the hue domains of a given culture, of several cultures, and of groups within cultures.

The history of semantic shifts has just begun to be written. Navaho color terms, we know, are used in systematically different predictable ways by bilinguals and monolinguals. Supported by the influence of language contact, the stabilization of bilingual reference categories probably leads at least in some cases to referential shifts also on the part of the monolingual community. Here, as in other areas, more research is needed, with exact physical referents as eliciting materials. The aim is transition from searchlight to sample case.