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Navaho Color Categories

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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.¹ 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: *tagai* white, to *xa'a'a'h* sunrise or east; *do-x'i'iz* blue, to *šádá'a'h* south; *lico* yellow, to 'e'e'a'h sunset or west; *dilzil* dark, to *názokos* north.²

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 *lupz'inna*; the speaker of English refers to this locus with no single word. And while a bilingual Zuni can translate English *orange* as *ʔolenči*, a Navaho of New Mexico and Arizona must use *lico* 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 Berard Haile, Soul concepts of the Navaho, *Annali Lateranensi* 7.70 (1943).

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 Hanunó color classification.³

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 Hanunó 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*, *lagtiq*, *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 *lagtiq* 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 Hanunó linguistic responses to painted cards, dyed fabrics, and other prepared materials according to distinctions on two levels, those of *mabi'ru*, *malagtiq*, *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,

³ See Harold C. Conklin, Hanunó color categories, *Southwestern journal of anthropology* 11.339-344 (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 yellow 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*, *Lg.* 35.631-36 (1959), where *q* rather than *ʔ* represents the glottal catch, and a raised dot serves instead of a macron.]

e.g. *bula·wan* 'gold, golden', for which *raraq* can be substituted on a more general level; (*ma*)*dapug* 'gray'; (*ma*)*qarum* 'violet'; (*ma*)*dilaw* 'yellow'; *mabirubiru* 'somewhat *mabi·ru*'; not a solid, deep black'; *mabi·ru(gid)* 'very *mabi·ru*; jet black'; *madi·lawdi·law* 'weak yellow'.

3. Conklin's use of prepared materials in eliciting color responses had a Southwest Project counterpart, so far as color codability experimentation with Munsell-Farnsworth color chips was concerned.⁴ Lenneberg and Roberts have defined codability as

a measure of the efficiency with which either a color or another sensory experience may be transmitted in a given language code. If a given color stimulus has a word reserved for it alone and if that word and its referent are well known to everyone who speaks that language, then the linguistically encoded color experience can be decoded with great efficiency by anyone who knows the code. In other words, in such a case the decoder can refer back to exactly the same color to which the encoder had originally referred. On the other hand, if a color has no universally accepted name or if there is no general agreement as to which color is designated by a given term, then the 'nameless' color cannot be transmitted over the code nor can the sending of the meaningless term result in proper decodification.⁵

One's ability to encode an experience and one's ability to recall that experience are related. Members of a given group find some colors easier to remember than others. Lenneberg and Roberts, discussing recognition behavior, observe:

The research hypothesis⁶ stated that the more accurately a color could be named in English, the better its chance for accurate recognition. Colors whose namability had been previously ascertained were briefly presented to subjects. After a given waiting period these colors then had to be identified from a large collection of colors. The results fully supported the hypothesis. The Zuni data also were used in the same way and again the results were encouraging ... In one respect ... the repetition of the recognition experiment with Zunis 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.⁷

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 *tangerine*

⁴ For a report on Southwest Project color data collected from Navaho subjects, see Susan M. Ervin, Semantic shift in bilingualism, *The journal of psychology* (in press).

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, *Anthropological linguistics* 1:9.11-19, §2 (1959). One of these tape sections, §2.3, involves directive eliciting of color terminology. The tape recording is available through the Archives of Languages of the World, Indiana University.

⁵ Eric H. Lenneberg and John M. Roberts, *The language of experience, A study in methodology* 20-21, IUPAL Memoir 13 (Supplement to *IJAL* 22, 1956).

⁶ In Roger W. Brown and E. H. Lenneberg, A study in language and cognition, *Journal of abnormal and social psychology* 49.454-62 (1954).

⁷ 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: *ličii*?⁸ 'it is red';⁹ *lico* 'it is yellow; it is orange';¹⁰ *doox'iž* 'it is blue; it is green; it is purple'; *łábá* 'it is gray'; *łagai* 'it is white';¹¹ *ližin* 'it is black'.¹² On the more specific level (Level II), variations along the dimensions of brightness, saturation, and hue are indicated by prefixation, cf. *ličii*? 'it is red', *dinilčii*? (also *dinlčii*?) 'it is reddish; it is light red or pink',¹³ and by qualification involving several words, cf. *dinłgai* 'it is whitish', *doox'iž* 'it is bogop', *dinłgai go doox'iž* 'it is whitish bogop'.¹⁴

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. <i>dinlčii</i> ? | 'it is light red' | A 1 |
| 2. <i>dinlčii</i> ? <i>igii</i> | 'the light red one' ¹⁵ | B 1 |

⁸ The orthography is that used by Harry Hoijer in *The chronology of the Athapaskan languages*, *IJAL* 22.219-32 (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. /'ʔəuuʔ/ 'yes', /'yooʔ/ 'bead'), and since we have found some minimal pairs with /ə/ (cf. /'ʔa'γos/ 'one's shoulder', /'ʔa'γəs/ 'one's aorta', /sə'γos/ 'my shoulder', /sə'γəs/ '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 /ə/.

⁹ An 'adjective' category, which some speakers of English might expect, does not exist; Sapir made this clear in A type of Athabaskan relative, *IJAL* 2.136-42 (1921-23). Navaho Level I terms are predicational forms.

¹⁰ We use acronyms hereafter as glosses: *yoo* for 'yellow-or-orange', and *bogop* for 'blue-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 *łagai* occurs at least in ceremonial contexts; perhaps it shows regressive vocalic assimilation—the Proto-Athapaskan prefix was **lě-*, possibly meaning 'inherent quality'.

¹² Beaverboard, coffee, or reddish-brown skin (as of an Indian) are referred to as *yišłiž* '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 *ličii*? 'it is red'; and in reference to a horse which is predominantly mouse-gray in color, one says *lii*? *yišłiž*, also *lii*? *yišłiž*, 'a gray horse'. Grimy or dirty skin, regardless of basic skin color, may be described as *yišłiž*, though *ližin* is more commonly used in this connection, metaphorically. In some but not all cases, then, *yišłiž* belongs on Level I.

On fluctuation of *ližin* and *dilzil*, see §6.2.

¹³ Also frequent are *dinoolł'iž* 'it is light bogop; it is bogopish'; *dinłgai* 'it is whitish'; *dinilbá* 'it is light gray; it is grayish'; *dinilžin* 'it is black-gray; it is dark in color, not too black; it is almost black, or very dark in color'; *dinilco* 'it is yooish; 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 enclitics appeared, particularly *i*, *ii* and *igii* 'the one (who or which ...)': *dinoolł'iž* 'it is light bogop', *dinoolł'iž ii* 'the one which is light bogop'. Before *i* or *igii*, a verb stem of the shape -C \check{V} V \check{C} has an alternant -C \check{V} C. Before *go* 'being thus' the alternant is -C \check{V} V \check{C} (cf. 19).

3. <i>hč'ii?</i>	'it is red'	C 1
4. <i>t'áá yéi o dinilč'ii?</i>	'it is just intense light red' ¹⁶	D 1
5. <i>t'óó dinilč'ii? lá</i>	'it is sort of light red, I find' ¹⁷	E 1
6. <i>cin bee yiyiilč'ii?</i>	'they dyed it red with wood' ¹⁸	A 4
7. <i>dinilč'ii? igtii</i>	'the light red one'	B 4
8. <i>hč'ii?</i>	'it is red'	C 4
9. <i>t'áá ?iyyisii yéi o hč'ii?</i> <i>nahalin</i>	'it looks like a very intense red' ¹⁹	D 4
10. <i>dinilč'ii?</i>	'it is light red'	E 4
11. <i>dibélč'ii? nahalin</i>	'it looks like sheep red' ²⁰	A 7
12. <i>dinlcui</i>	'it is light yoo'	B 7
13. <i>hico</i>	'it is yoo'	C 7
14. <i>dinilč'ii?</i>	'it is light red'	D E 7
15. <i>dibélč'ii? nahaló hč'ii?</i>	'it is red like sheep red'	A 10
16. <i>hicoh i</i>	'the yoo one'	B 10
17. <i>nitxin</i>	'it is dirty gray; it is shiny, greasy, grayish brown, with luster (as the color of certain horses)'	C 10
18. <i>hico nahaló dinilč'ii?</i>	'it is light red like yoo; it is yooish reddish'	D 10
19. <i>dinilč'ii? go tábá</i>	'it is gray, being light red; it is reddish gray'	E 10
20. <i>dinlcogh i yee?</i>	'really a light yoo one' ²¹	A 13
21. <i>?áá yéi go dinlcui</i>	'it is just about intense light yoo' ²²	B 13
22. <i>hico</i>	'it is yoo'	C 13
23. <i>t'óó tábá nahaló dinilč'ii?</i>	'it is light red sort of like gray'	D 13
24. <i>?éi t'óó ?ayúu yišxiž dinlba</i>	'that is grayish, sort of remark- ably brown' ²³	E 13
25. <i>cin bee yiyiilcui</i>	'they dyed it yoo with wood' ²⁴	A 16
26. <i>hicoh igtii</i>	'the yoo one'	B 16
27. <i>hico</i>	'it is yoo'	C 16
28. <i>hico lá</i>	'it is yoo, I find'	D 16
29. <i>dinlco go t'óó tábá ?aldó?</i>	'it is sort of gray, being light yoo also; it is yooish gray' ²⁵	E 16

¹⁶ *t'áá* 'just, about'; *yéi* 'hard, intense'; *o* 'being thus'; cf. *t'áá ?iyyisii* 'it is just much', five expressions down (9).

¹⁷ *t'óó* 'just, merely, sort of'; *lá* 'I find'.

¹⁸ *cin* 'wood'; *bee* 'with it'; *yiyiilč'ii?* 'they dyed it red'.

¹⁹ *nahalin* 'it looks like it', as in *dibélč'ii? nahalin* 'it looks like sheep red' (11); cf. *nahaló* 'it is like it'.

²⁰ *dibélč'ii?* 'it is sheep red' is derived from *dibé* 'sheep' plus *hč'ii?* 'it is red'. Some sheep are this color, a ruddy blend of black and red.

²¹ *yee?* 'really, emphatically'.

²² *?áá* is a colloquial variant of *t'áá* 'just'; cf. *?óó* beside *t'óó* 'sort of'.

²³ *?éi* 'that'; *?ayúu*, also *?ayúí*, 'remarkably, very'.

²⁴ *yiyiilcui* '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 *?aldó?* 'also, too'.

30. <i>cin bee yiyi'it'ci?</i>	'they dyed it red with wood'	A 19
31. <i>?áá yéi go di'nlcui</i>	'it is just intense light yoo'	B 19
32. <i>lico</i>	'it is yoo'	C 19
33. <i>?éi t'óó tábá nahaló dóó di'nlbá</i>	'that is sort of like gray and it is light gray; that is sort of gray like light gray' ²⁶	D 19
34. <i>di'nlco go dóó tábá</i>	'it is gray and it is thus, light yoo'	E 19
35. <i>dinool'x'iz'ii yee? dóó di'nlcoh i yee?</i>	'the really light bogop and really light yoo one'	A 22
36. <i>yis'x'iz'igtí</i>	'the brown one'	B 22
37. <i>lico</i>	'it is yoo'	C 22
38. <i>x'oh di'nlbá nahaló dinool'x'iz'</i>	'it is light bogop like grayish grass' ²⁷	D 22
39. <i>k'asdáá? lico t'óó náá di'nlbá</i>	'it is almost yoo, sort of light gray again' ²⁸	E 22
40. <i>é'il dadool'x'iz'igtí nahalin</i>	'it looks like the ones which are bogop plants' ²⁹	A 25
41. <i>yis'x'iz'igtí</i>	'the brown one'	B 25
42. <i>lico</i>	'it is yoo'	C 25
43. <i>t'óó lico nahaló dinool'x'iz'</i>	'it is light bogop sort of like yoo; it is bogopish but with a little yoo'	D 25
44. <i>dinool'x'iz' o t'óó di'nlbá</i>	'being light bogop, it is sort of light gray'	E 25
45. <i>x'oh licoh i nahaló dool'x'iz'</i>	'it is bogop like hay' ³⁰	A 28
46. <i>táx'id'igtí</i>	'the green one' ³¹	B 28
47. <i>dool'x'iz'</i>	'it is bogop'	C 28
48. <i>tax'ilbáh'igtí nahaló</i>	'it is like one which is grayish green'	D 28
49. <i>?áá yóó di'nl—dool'x'iz' go ?áá-dó? t'óó di'nlbá</i>	'it is just a bit (gray?)ish—being bogop it is also sort of grayish' ³²	E 28
50. <i>é'il bit'aa? nahaló dool'x'iz'</i>	'it is bogop like a plant leaf' ³³	A 31
51. <i>táx'id'igtí</i>	'the green one'	B 31
52. <i>dool'x'iz'</i>	'it is bogop'	C 31
53. <i>t'óó tégai go dool'x'iz'</i>	'being sort of white, it is bogop'	D 31

²⁶ *dóó* 'and'.

²⁷ *x'oh* 'grass'; *di'nlbá* 'it is grayish or light gray'.

²⁸ Reference is made to color 49, which E had seen just before seeing color 22; *k'asdáá?* 'almost'; *náá* 'again'.

²⁹ *da-* 'severally'.

³⁰ *x'oh licoh i* is a relative expression, 'the one which is yoo grass; hay'.

³¹ *tá-* 'water'; *-x'id* 'be bogop'; 'it is moss or algae green; it is water-scum green'—some Navahos will not use the word *táx'id* in polite conversation, because *x'id* means 'fart' when used as a noun.

³² *?áá yóó*, like *t'áá b'iyó*, means 'just a bit'.

³³ *é'il* 'plant'; *bit'aa?* 'its leaf'.

54. <i>t'ádá ?ádá yóó t'óó dínłžin</i> <i>dooł'izž</i>	'it is just a trifle short of darkish bogop'	E 31
55. <i>ł'oh łicoh ł nahalín</i>	'it looks like hay'	A 34
56. <i>táł'id łgłł</i>	'the green one'	B 34
57. <i>dooł'izž</i>	'it is bogop'	C 34
58. <i>t'ádá ?ıyısıtı yéi go dínoolł'izž</i>	'it is very intense light bogop'	D 34
59. <i>dooł'izž t'óó łábá</i>	'it is bogop sort of gray'	E 34
60. <i>dooł'izži nahaló dooł'izž</i>	'it is bogop like turquoise' ³⁴	A 37
61. <i>táł'id ł</i>	'the green one'	B 37
62. <i>dooł'izž</i>	'it is bogop'	C 37
63. <i>t'ádá nád bıč'ı? ?ayıu dínıl ...</i> <i>nád dínoolł'izž</i>	'just about that way again it is very (?)ish ... it is light bogop again' ³⁵	D 37
64. <i>dooł'izž t'óó łábá</i>	'it is bogop sort of gray'	E 37
65. <i>ł'oh nahaló dooł'izž</i>	'it is bogop like grass'	A 40
66. <i>dooł'izži nahalín</i>	'it looks like turquoise'	B 40
67. <i>dooł'izž</i>	'it is bogop'	C 40
68. <i>t'ádá ?ıyısıtı yéi o táł'id</i> <i>dooł'izž łgłł</i>	'the one which is just a very intense green bogop'	D 40
69. <i>dooł'izž o dínłbá</i>	'being bogop, it is light gray'	E 40
70. <i>dooł'izži nahaló dooł'izž</i>	'it is bogop like turquoise'	A 43
71. <i>dooł'izži nahalín łgłł</i>	'the one which is like turquoise'	B 43
72. <i>dooł'izž</i>	'it is bogop'	C 43
73. <i>?ádá ?ádá yóó bıtxa? łgłł</i> <i>?át'é o nahalín dínoolł'izž go</i>	'it looks like the one which is just a little bit between them, being light bogop' ³⁶	D 43
74. <i>dooł'izž go t'óó łábá</i>	'being bogop, it is sort of gray'	E 43
75. <i>dooł'izži nahaló dooł'izž</i>	'it is bogop like turquoise'	A 46
76. <i>dooł'izži nahalín łgłł</i>	'the one which looks like turquoise'	B 46
77. <i>dooł'izž</i>	'it is bogop'	C 46
78. <i>t'ádá nád bıtıs ł go yéi o nád</i> <i>dínoolł'izž</i>	'it being just again the one which is a shade beyond it in intensity, it is again light bogop' ³⁷	D 46
79. <i>dooł'izž o t'óó łábá</i>	'being bogop, it is sort of gray'	E 46

³⁴ The form *dooł'izži* 'turquoise' is a noun derived from *dooł'izž* 'it is bogop' plus the relative enclitic *ıı* 'the one (who or which ...)'. We test a form to determine if it is a noun or a relative expression by asking whether an IC can be inserted between the enclitic and what precedes it in its constitute; if it can, we have a relative expression, if not, a noun: *łıı? łgłł* 'the particular horse' is a relative expression, since one can say for example *łıı? 2 dah 3 dııl-yod 1 łgłł* 'the horse that got away' (numerals show rank of IC cut; *dah dııl-yod* means 'he ran off'); but *dólıı* 'bluebird' is a noun, since the form cannot be expanded (cf. *cranberry: dól- of dólıı*).

³⁵ Reference is made to color 55, which D had seen just before seeing color 37; *bıč'ı?* 'toward it'.

³⁶ *bıtxa?* 'between them'; *?át'é* 'it is thus'.

³⁷ Reference is made to color 34, which D had seen just before seeing color 46; *bıtıs* 'over it, above it; a shade beyond it'.

80. <i>dooł'íži nahalin</i>	'it looks like turquoise'	A 49
81. <i>dooł'íži nahalin ígtí</i>	'the one which looks like turquoise'	B 49
82. <i>dooł'íž</i>	'it is bogop'	C 49
83. <i>dinłgai go dooł'íž lá</i>	'being whitish, it is bogop, I find'	D 49
84. <i>dooł'íž go t'óó łábá</i>	'being bogop, it is sort of gray'	E 49
85. <i>k'os nahaló dooł'íž</i>	'it is bogop like the sky'	A 52
86. <i>dooł'íži nahalin</i>	'it looks like turquoise'	B 52
87. <i>dooł'íž</i>	'it is bogop'	C 52
88. <i>yéi go dinoolł'íž</i>	'it is intense light bogop'	D 52
89. <i>dooł'íž t'óó diñłbá</i>	'it is bogop sort of light gray'	E 52
90. <i>dooł'íži nahaló dooł'íž</i>	'it is bogop like turquoise'	A 55
91. <i>k'os nahaló dooł'íž ígtí</i>	'the one which is bogop like the sky'	B 55
92. <i>dooł'íž</i>	'it is bogop'	C 55
93. <i>t'áá yéi go dooł'íž</i>	'it is just intense bogop'	D 55
94. <i>?éi wóžó t'áá dooł'íž ñdi t'áá ?íiyisítí łábá</i>	'though that is just fairly bogop, it is very gray' ³⁸	E 55
95. <i>t'óó diñłbá o dooł'íž</i>	'being sort of light gray, it is bogop'	A 58
96. <i>k'os nahaló dooł'íži</i>	'turquoise like the sky'	B 58
97. <i>dooł'íž</i>	'it is bogop'	C 58
98. <i>t'áá ?íiyisítí t'áá yéi o dinoolł'íž</i>	'it is very very intense light bogop' ³⁹	D 58
99. <i>t'éiyá diñłgai go dóó łábá</i>	'it is only thus: it is whitish; and it is gray' ⁴⁰	E 58
100. <i>leešč'ih nahaló łábá</i>	'it is gray like ashes' ⁴¹	A 61
101. <i>łábáh ígtí</i>	'the gray one'	B 61
102. <i>dooł'íž</i>	'it is bogop'	C 61
103. <i>łábáa go ?álc'íísí go dooł'íž</i>	'being gray, it is just barely bogop' ⁴²	D 61
104. <i>t'áá ?álc'íísí go dinoolł'íž o t'óó łábá</i>	'being just barely light bogop, it is sort of gray'	E 61
105. <i>łábáa o dooł'íž</i>	'being gray, it is bogop'	A 64
106. <i>waa? bíłátah í</i>	'(the color of) beeweed flowers' ⁴³	B 64
107. <i>dooł'íž</i>	'it is bogop'	C 64
108. <i>?éi ?éi t'óó łábá nahalin</i>	'that looks like it is sort of gray' ⁴⁴	D 64
109. <i>dinłgai go t'óó łábá ?aldó?</i>	'being whitish, it is sort of gray too'	E 64
110. <i>cédidééh</i>	'purple four o'clock (<i>Mirabilis</i>)'	A 67

³⁸ *wóžó* 'fairly'; *ñdi* 'though'.

³⁹ *t'áá ?íiyisítí* 'it is just much'; *t'áá yéi o* 'just intensely'.

⁴⁰ *t'éiyá* 'only'.

⁴¹ *leešč'ih* 'ashes'.

⁴² *?álc'íísí* 'it is little; just barely'.

⁴³ *waa?* 'beeweed, *Cleome pungens*'; *bíłátah* 'its flowers'.

⁴⁴ *?éi* 'that', repeated for emphasis.

111. <i>waaʔ blátah í</i>	'beeweed flowers'	B 67
112. <i>dooʔ'iz̄</i>	'it is bogop'	C 67
113. <i>ʔátc'úst̄ go tábá nahalín</i>	'it just barely looks like gray'	D 67
114. <i>dooʔ'iz̄ diñlgai</i>	'it is whitish bogop'	E 67
115. <i>cédiééh nahaló dooʔ'iz̄</i>	'it is bogop like purple four o'- clock'	A 70
116. <i>waaʔ blátah í</i>	'beeweed flowers'	B 70
117. <i>dooʔ'iz̄</i>	'it is bogop'	C 70
118. <i>ʔét̄ t'óó diñlčt̄? lá t'íh̄t̄ go</i>	'that is sort of pink, I find, slightly' ⁴⁶	D 70
119. <i>diñlčt̄? go ʔáá yóó diñlgai go</i> <i>t'óó tábá</i>	'being light red, being just a bit whitish, it is sort of gray'	E 70
120. <i>cédiééh nahaló hčt̄?</i>	'it is red like purple four o'clock'	A 73
121. <i>diñlčt̄? ígt̄</i>	'the one which is light red'	B 73
122. <i>hčt̄?</i>	'it is red'	C 73
123. <i>t'íh̄t̄ go yeeʔ diñlčt̄?</i>	'it is very slightly light red' ⁴⁶	D 73
124. <i>t'áá ʔátc'úst̄ go diñlčt̄? go</i> <i>t'óó tábá</i>	'being just barely light red, it is sort of gray'	E 73
125. <i>diñlčt̄?</i>	'it is light red'	A 76
126. <i>waaʔ blátah í</i>	'beeweed flowers'	B 76
127. <i>hčt̄?</i>	'it is red'	C 76
128. <i>t'óó diñlčt̄?</i>	'it is sort of light red'	D 76
129. <i>diñlčt̄? go t'óó tábá</i>	'being light red, it is sort of gray'	E 76
130. <i>cin bee yiyiñlčt̄?</i>	'they have dyed it red with wood'	A 79
131. <i>diñlčt̄? ígt̄</i>	'the light red one'	B 79
132. <i>diñlčt̄?</i>	'it is light red'	C 79
133. <i>diñlčt̄? lá</i>	'it is light red, I find'	D 79
134. <i>t'óó diñlčt̄?</i>	'it is sort of light red'	E 79
135. <i>diñlčt̄?</i>	'it is light red'	A 82
136. <i>diñlčt̄? ígt̄</i>	'the light red one'	B 82
137. <i>hčt̄?</i>	'it is red'	C 82
138. <i>t'óó tico nahaló diñlčt̄?</i>	'it is light red like a sort of yoo'	D 82
139. <i>t'áá náá diñlčt̄?</i>	'it is just light red again'	E 82
140. <i>diñlčt̄?</i>	'it is light red'	A 85
141. <i>diñlčt̄? ígt̄</i>	'the light red one'	B 85
142. <i>hčt̄?</i>	'it is red'	C 85
143. <i>t'áá yéi go diñlčt̄? lá</i>	'it is just intensely light red, I find'	D 85
144. <i>diñlčt̄?</i>	'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,⁴⁷ but suited to our economic and

⁴⁶ *t'íh̄t̄* 'a trifle, slight bit'; *t'íh̄t̄* is a variant (see 123).

⁴⁶ D uses both *t'íh̄t̄* (see 118) and *t'íh̄t̄*. Informants say these forms have the same meaning.

⁴⁷ Op.cit. 17-19.

temporal limitations. Instructions for the identification of the Munsell colors were taped.⁴⁸

díí kó dóó dákwíí šíí ?at?aa t'áadoole?é yišlééž go hč'í? kódoólníí díí céso? bii? ži? . ?áá dóó dínííł'ííł, ?áá dóó ?ilcéeh o ?éí kót'áo yišlééž hdi?niih dooleel. ?éí tíč'í? yinilcqa go ?éí tíč'í? hdi?niih dooleel. dooł'iz yinilcqa go dó? dooł'iz doo. ?áá dóó díí ?éí ?akóolyé. ?éí doo da go ?éí t'áá blyó bíži? naneez go da ?éí t'áá háida beehontsin ígtí bíł náhólnih í gi ?it'áo šil hoodílnih. ?áá dóó ?éí t'óó deilce? góó c'íł go šil náhólnih doo. ?á ko ?éí t'óó deilce? góó nétnižiih doo. ?éí t'áá ?á kwíí ži saad bee yáníłti? í gi ?at'áo bee šil náhólni? doo.

'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: *haa yi't'é, kico da, dooł'iz da* 'how is it, yoo for example, or bogop?'. (The word 'color' in the translation above is gratuitous.)

6.2. Two stems for 'black' are in complementary fluctuation, *-žin* and *-xil*; cf. *tižin* 'it is black; it is grayish or brownish or yellowish black' and *dilxil* 'it is black (as it can be, like charcoal); it is dark (as some mountains, or the atmosphere in bad weather)'. The phrase *dilxil go* 'being very dark' qualifies value, as in *dilxil go dooł'iz* 'very dark bogop'.⁵⁰

6.3. Relative expressions which indicate variation in the tinting or hue of any particular color are *bee ?iilč'ih í* 'the made-red-with-it one'; *bee ?iilž'ih í* 'the made-black-with-it one'; *bee ?iilgah í* 'the made-white-with-it one'; cf. *bee ?iilč'ih í táł'id ígtí* 'the particular one which is green with red coloring'; *bee ?iilč'ih í dooł'iz ígtí* 'the particular one which is bogop with red coloring'; *č'il* 'plant', *č'il bee ?iilč'ih í* 'a plant with red coloring'; *leež* 'earth', *leež bee ?iilč'ih í* 'earth with (mineral) red coloring'.

⁴⁸ A translation from English to Navaho by one informant was transcribed and back-translated with another informant, as a check, before the instruction taping was used.

⁴⁹ Ervin and Horowitz at Fort Defiance, Arizona; Horowitz also at Shiprock, N. M.

⁵⁰ Cf. *dinilžin*, fn. 13, and the use of *yišłiž* and *ližin* 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 *naakai ližin ii* '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 adjunct (or 'postposition') *biγá* 'through it' with appropriate verbal forms; cf. *biγá di?náéi? go dínool'íž* 'it is light bogop, being thus: it looks red through it'.

6.5. The prefix complexes *dinil-* (*dinil-*) 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 whitish; it is sort of white', *dinoolgai* 'it is sort of white; it is on the white side'; *-co* 'be yoo', *dinilco* 'it is light yoo; it is yooish', *dinilcoh ó yéé* 'it is a pale yoo one'.⁵¹

6.6. The terms *lico* 'it is yoo', *lico ii* 'the yellow one (wool, sand for ceremonial painting)', *licúú* 'the orange one (fruit, *Citrus sinensis*); bile (as seen in vomitus)' and *lico ígúú* '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 *noodóǒz* '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 *yisá'in* '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 *líkiž* 'it is spotted' (cf. *bee* 'with it', *licúú?* 1 *bee* 2 *líkiž* 'it is spotted with red'). A sparkling effect, as of a twinkling star, is indicated by *disqs* 'it is sparkling'; this sparkle differs from the shine of a glittering or flashing object, which is denoted by the stem *-dín* 'shine, produce light' (*žóhonaá?éi? adínildín* 'the sun is shining') or by the stem *-éil* 'glitter as a reflection in the distance'.

6.8. Verbs, including those relating to colors, are conjugated in a variety of paradigms.⁵² A neuter paradigm, for example, exists for the stem *-co* 'be yoo', some members of which are *linisco* 'I am yoo', *linico* 'you (sg.) are yoo', *lico* 'he, she, it is yoo; they are yoo', *žilco* 'one [distant] is yoo' *liniico* 'we two are yoo' *linohco* 'you two are yoo', *halco* '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* (*yidoolco* 'he will color it yoo'), *-cóoh* (*yiyiilcóoh* 'he colors it yoo'), *-cui* (*yiyiilcui* 'he colored it yoo'), *-coh* (*náyiiilcoh* 'he colors it yoo now and then'), *-cóoh* (*yoolcóoh* 'I wish he would color it yoo'); compare also these same stems with different prefix complexes, for 'become or turn yoo': *yideesco* 'I shall turn yoo', *yiiicóoh* 'he turns yoo; we two turn yoo', *yiniicui* 'you (sg.) turned yoo', *bikáǒgí yiiicui* 'his skin turned yoo', *néiscóoh* 'I turn yoo now and then', *γóólcóoh* 'I wish you (sg.) would turn yoo'.

Stems relating to colors also include *-liš*, *-leeš*, *-lééž*, *-liš*, *-leeš* 'smear on white clay; paint' (cf. e.g. *šélééž* 'I painted it', *ná?áliš* 'he paints, now and then');

⁵¹ *ó*, assimilated form of *i* 'the one (who or which ...)'; *yéé* 'emphasis'.

⁵² See Harry Hoijer, The Apachean verb, Part I: Verb structure and pronominal prefixes, *IJAL* 11.193–203 (1945); Part II: The prefixes for mode and tense, *IJAL* 12.1–13 (1946); Part III: The classifiers, *IJAL* 12.51–59 (1946); Part IV: Major form classes, *IJAL* 14.247–59 (1948); Part V: The theme and prefix complex, *IJAL* 15.12–22 (1949); Berard Haile, *A stem vocabulary of the Navaho language*, 2.v–xlv (1951); Robert W. Young, *The Navajo yearbook* 197–228 (1958).

-č'qh, -č'qah, -č'qa?, -č'qh, -č-qah 'decorate, embellish, design, draw, paint, engrave' (*nišéc'qa?* 'I decorated it', *ni'šéc'qa?* 'I decorated something; I painted a picture'), -x'is, -x'itš, -x'iiž (-x'iz), -x'is, -x'itš 'be bogop' (*bibid diix'iiž* 'his belly became bogop',⁵³ *dinišx'iz* 'I am bogop', *yidiitx'iiž* 'he dyed it bogop'); -čih, -čitš, -čii? (-čitš?), -čih, -čitš 'be red' (*yiičii?* 'it became red', *sizábqah yilčii?* 'I reddened my lips', *liniicčii?* 'we two are red', *néičih* 'it gets red now and then', *γooščih* 'might I color it red'); -gah, -gáh, -gaii (-gai), -gah, -gáh 'be white' (*yidoogah* 'it will get white', *yigaii* 'it got white', *néigah* 'it gets white now and then', *linohgai* 'you two are white', *yilgaii* 'I made it white'); -šitš, -šitšh, -šitš?, -šitšh, -šitšh 'color black' (*yisšitš?* 'I made it black'); -žitš, -žitšh (-žin), -žitš?, -žitšh, -žitšh 'be black' (*yisžitš?* 'he became black', *dinišžin* 'I am dark brown', *linišžin* 'I am black', *hiižitš?* 'it became dusk').⁵⁴

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 29.⁵⁵ 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.⁵⁶ 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 (*ninii? ližin* 'your face is black') and specialized references (*itššix'iz* 'a gray horse', but *yisx'iz* '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? Hanunóo, 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,

⁵³ Said of the swollen, vein-covered abdomen of a starving Indian, the veins appearing blue-green against the skin.

⁵⁴ Now see Berard Haile, *Legend of the Ghostway ritual in the male branch of Shootingway* 219–224 (1950), 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.

⁵⁵ Op.cit. 18.

⁵⁶ For details, see Ervin, loc.cit.

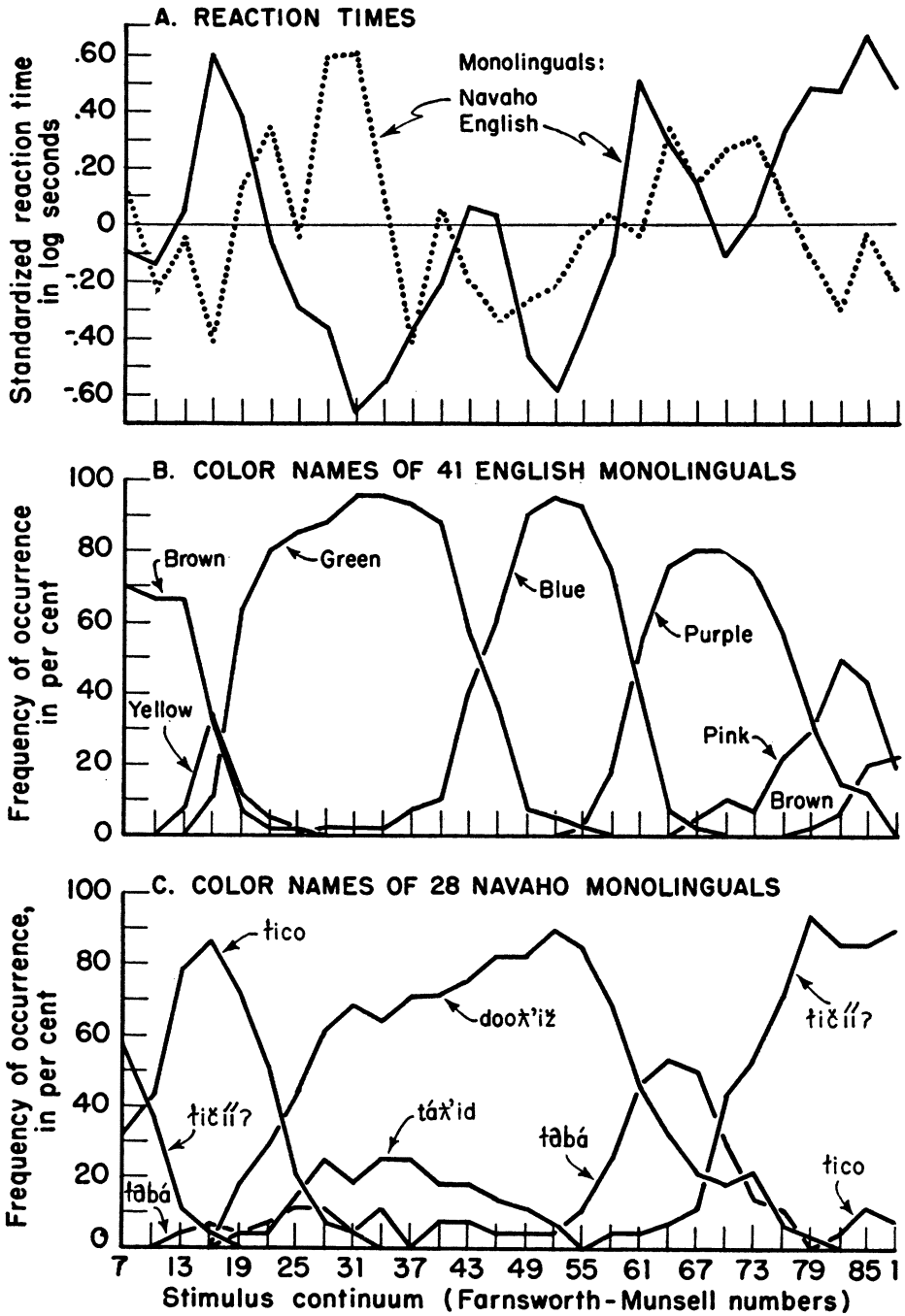


FIGURE 1

we dramatize some disparities from clinical records,⁵⁷ to lend 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'óó dit'ih go, niłzil go dóó ticxo go hahathééš yileeh žintí ... ʔindáda hanéʔéštíl da ʔákót'ée go t'óó bíyo dooł'iz nahalin go hažiıyeeh leh* '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.'⁵⁸ Another said, *hanéʔéstoʔ da nikiʔdiılıš žintí. ʔónáásdóó t'óó dit'ih nahalin yileeh, t'ád bíyo ticxo go tábá nahalin 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 ticxo da náleehe, ʔında dooł'iz da yileeh* '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. *ʔəə, hahidížeeh éš? [Uh, do you spit out time after time?]*

Patient. *ʔəuuʔ. [Yes.]*

Int. *Yes.*

Doc. *Mostly in the morning or just any time?*

Int. *ʔabini go óš t'éiyá ní? [He says, is it only in the morning?]*

Pt. *ʔabini go t'éiyá ʔákónát'íih, ʔəuuʔ. [Only in the morning it happens now and again like that, yes.]*

Int. *ʔáá dóó žíí go ʔét doo ʔát'íi da, doo ʔántí'íi da. [Then during the day it doesn't do that, you don't do it.]*

Pt. *ʔəuuʔ. [Yes.]*

Int. *Just in the morning.*

Doc. *What is the color of the spit?*

Int. *ʔá ko šqʔ daa yit'é ní? [I'd like to know then, how is it, he says.]*

Pt. *díi ko di néʔéštíl ígtí ʔét t'óó ʔahayít leh. [This particular nasal mucus up in here, usually there is just lots of it.]*

Int. *ninéʔéštíl ígtí? [Mucus in your nose?]*

Pt. *ʔəuuʔ. [Yes.]*

Int. *ʔá ko óš hahíłeeh? [Then do you haul it out (as mushy matter)?]*

Pt. *ʔəuuʔ. [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. *haa yit'ée leh níét hahidížeeh go da, ninéʔéštíl ígtí hahíłeeh go da? [How*

⁵⁷ Kindly provided by John Adair.

⁵⁸ The *-x-* gives the stem *-cxo* augmentative-pejorative meaning, and has been rendered as 'nasty'; cf. *híčxíiʔ* 'it is nasty red', as in *hanáaʔ da t'óó bíyo híčxíiʔ yileeh* 'one's eyes, for example, become a rather nasty red'. (On *-x-*, 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. *né'éstíł ígtí 'éí lícxo leh, 'álc'ítstí go díł bitaašcii' leh.* [The nasal mucus, that's usually nasty yoo; usually a little blood is red within it.]

Int. *doo óš níníí' hašc'íi' da?* [Is your nose not sore inside?]

Pt. *'əuu', doo 'át'ée da.* [Yes, it is not.]

Int. *nižé' ígtí šq' 'éí haa yi'ée leh, hahidížeeh ígtí?* [What about your particular spit, how is that usually, you being the one who spits out time after time?]

Pt. *'éí 'aldó' t'áá 'akó'é. t'áá bíyo lícxo nahalín.* [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—*dooł'iz* is not 'blue' and *lico* 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 *licíí'* and *lico* probably occurs between red-orange and everything yellower. Similarly, *łəbá*, 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 *dooł'iz*.

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.