1962 Annual Spring Meeting of the American Ethnological Society, Seattle: University of Washington Press (distributor).
Swadesh, Morris
1950 Salish Internal Relationships. International Journal of American Linguistics 16:157-167.
Teit, James A.
1930 The Salishan Tribes of the Western Plateau. Annual Report of the Bureau of American Ethnology 45.
Thompson, Laurence C.
1979 Salishan and the Northwest. *In* The Languages of Native America: Historical and Comparative Assessment. Lyle Campbell and Marianne Mithun, eds. pp. 692-765. Austin: University of Texas Press.

Loose Talk: Linguistic Competence and Recognition Ability

JOHN B. GATEWOOD
Department of Social Relations
Lehigh University
Bethlehem, PA

Which of us knows all the words of the language he speaks and the entire signification of each? [Durkheim 1965:483]

Most every day, I have occasion to indulge in loose talk. I tell someone about something I have never seen and could not recognize were I to bump into it. On the other hand, some portions of my world are quite familiar, but I am hard pressed to talk about them for lack of their names. Considering the number of named categories I cannot recognize and the number of familiar objects I cannot properly name, it is almost a surprise to find that I routinely name *and* recognize a vast portion of my world. Not everything I say is loose talk. Yet, it is clear that the ability to talk about and the ability to recognize are independent skills.

This paper considers the significance of the fact that one may know and use a word without being able to recognize its empirical referent. The first section presents some data collected from urban American college students concerning kinds of trees. At least within this limited domain, the average American knows the names for more kinds of trees than he or she is able to recognize. The second section compares the findings from the American sample with reports published on the folk botanies of more close-to-nature peoples. The third section speculates from the foregoing observations and tries to make sense of people's inability to recognize the empirical referents for many of the words they use. These speculations focus on the role of language in the evolutionary history of the human species, especially with respect to the division of labor in society.

SOME DATA FROM AMERICAN INFORMANTS

In studying the discrepancy between linguistic competence and recognition ability, one would be ill-advised to select abstract nouns. It would come as no surprise to find that informants not only disagree with one another, but also cannot make up their own minds regarding instances of justice, truth, or beauty. However, with more concrete nouns, these definitional ambiguities of the abstract are circumvented. Trees provide one such semantic domain, and they have been a mainstay in ethnoscientific inquiries. For these reasons, rather than attempting to sample entire vocabularies, I studied Americans' linguistic versus recognition abilities within this narrow domain.

The Sample

The informants for this study were 40 college students, all native speakers of English, who grew up and resided in the Eastern Woodlands of the United States. Their direct experience with trees ranged from strolls through inner-city parks to hiking excursions through forests to summer camps. None had any special reasons for attending to trees beyond these sorts of casual encounters, that is, none was a forestry major, a landscape architect, or a lumberjack.

Data Collection Procedure

Data were collected in a free-recall task. Informants were asked to list all the kinds of trees they could think of as they sat in the classroom. Though no time limit was imposed, each informant completed his or her list within about 15 minutes. When all were finished with this first task, they were told not to add more items. Then, they were instructed to go through their lists (each his or her own) and to indicate with an asterisk all those kinds of trees which they felt they could recognize if encountered growing somewhere. In the case of fruit, nut, and flowering trees, they were told to indicate "recognizable" only if they could do so without the fruit, nut, or flower as a guide. For example, if an orange tree would be recognizable only if there were oranges growing from it, then it should *not* be claimed as a recognizable variety of tree.

It may be argued that a free-recall task does not reveal the whole of an informant's linguistic knowledge. Further, allowing informants to decide whether or not they can recognize a category is perhaps not the best measure of their actual recognition abilities. Both criticisms are valid as far as they go. However, the task was the same for all informants, and the distortions inherent in these measuring techniques would have a unidirectional effect—diminishing rather than exaggerating any discrepancy between linguistic and recognition abilities. I would hypothesize that more comprehensive measures of these abilities would produce either comparable or greater evidence for a discrepancy between them.

Results

Table I shows the responses of the 40 informants condensed into frequencies and percentages. Box A presents these data directly, as they were computed from the data sheets. Boxes B, C, and D depend upon an analytical distinction between "fruit" and "nonfruit." Segregates (i.e., labeled categories) were classed as fruit if, in my opinion, Americans' familiarity with the empirical referents derives primarily from a supermarket context, that is, from the edible parts. The basic finding here is that recognizable segregates comprise an average of only 50% of an informant's list. This would imply that there is a lot of loose talk when Americans discuss trees.

Table II displays the data in a different form. Taken collectively, the 40 informants listed 101 different kinds of trees.[1] Table II presents these varieties in alphabetical order and shows both the number of lists a segregate appeared in and the number of times it was claimed as recognizable.

Using the information in Table II, Table III presents the 20 most frequently listed segregates alongside the 20 most recognizable segregates. Rank order in these lists is based upon simple frequencies in Table II rather than ratios of times recognized to times listed. The Spearman rank-order correlation coefficient for these two is 516, which is significant at a p of .01 in a one-tailed test. The correlation would be stronger were it not for a systematic peculiarity of fruit trees. Fruit trees appear high in the ranks of the frequently listed, but they drop considerably in the ranks of recognizable trees. This reflects, no doubt, both the background of the informants (residents of mid-Atlantic states rather than of Florida or California) and the special instructions concerning fruit, nut, and flowering trees.

Discussion of Results

There are several minor hypotheses that can be tested through correlational analyses of the data. Two are discussed below as examples.

HYPOTHESIS 1: *People who list more segregates also recognize trees better than do people with shorter lists.*

If we take the simple number of recognizable segregates as the measure of recognition ability and plot this against the total number of segregates listed by an informant, then we would conclude that Hypothesis 1 is correct. The Pearson r for these two variables is .715, which is significant at a p of .005 in a one-tailed test. However, this is an improper use of the statistic because the number of recognizable segregates in a list is not, in principle, orthogonal with the total number in the list. A better measure of recognition ability is the percentage of recognizable segregates in an informant's list. When this is plotted against the total number of segregates in a list, the Pearson r is only .203, which is *not* a significant correlation. Therefore, Hypothesis 1 is not substantiated by the data.

HYPOTHESIS 2: Perhaps if a person can recognize fruit trees well, then he or she can also recognize relatively many nonfruit trees, and vice versa. In other words, *recognition ability is proportional irrespective of the distinction between "fruit" and "nonfruit."*

Again, the Pearson r (.155) between these two variables is not significant and, therefore, the hypothesis is not substantiated by the data.

Summarizing the findings from the sample of American college students, the following points are in order: (1) Americans who have no special reasons for knowing about trees know the names for more kinds of trees than they are able to recognize. (2) Quantitatively, the average informant can recognize only 50% of the segregates he or she lists in a free-recall task (when the domain is trees). (3) There is considerable inter-informant diversity within the sample, that is, there are large standard deviations for almost any variable, and this gives rise to low correlations in the aggregate.

TABLE 1. THE DATA FROM 40 AMERICAN INFORMANTS.

	Box A			Box B			Box C			Box D
Subject's number	Total no. of segregates listed	Total no. in list recognizable	Percentage	No. of fruit trees in list	No. of fruit trees recognizable	Percentage	No. of nonfruit trees in list	No. of nonfruit trees recognizable	Percentage	Percentage of fruit trees in list
1.	8	5	63%	0	0	—	8	5	63%	0%
2.	17	9	53%	4	1	25%	13	8	62%	24%
3.	15	9	60%	6	1	17%	9	8	89%	40%
4.	18	8	44%	9	3	33%	9	5	56%	50%
5.	24	19	79%	2	2	100%	22	17	77%	8%
6.	10	7	70%	2	2	100%	8	5	63%	20%
7.	13	10	77%	3	3	100%	10	7	70%	23%
8.	28	24	86%	9	5	56%	19	19	100%	32%
9.	22	10	45%	8	4	50%	14	6	43%	36%
10.	26	8	31%	8	3	38%	18	5	28%	31%
11.	22	7	32%	8	0	0%	14	7	50%	36%
12.	20	12	60%	8	0	0%	12	12	100%	40%
13.	15	2	13%	7	0	0%	8	2	25%	47%
14.	19	14	74%	6	4	67%	13	10	77%	32%
15.	16	10	63%	10	5	50%	6	5	83%	63%
16.	19	12	63%	8	7	88%	11	5	45%	42%
17.	16	10	63%	4	0	0%	12	10	83%	25%
18.	14	3	21%	7	0	0%	7	3	43%	50%
19.	10	1	10%	1	0	0%	9	1	11%	10%
20.	14	4	29%	4	0	0%	10	4	40%	29%
21.	9	4	44%	4	0	0%	5	4	80%	44%

22.	11	5	45%	4	1	25%	7	4	57%	36%
23.	12	4	33%	6	0	0%	6	4	67%	50%
24.	13	8	62%	5	2	40%	8	6	75%	38%
25.	31	16	52%	10	5	50%	21	11	52%	32%
26.	11	6	55%	3	3	100%	8	3	38%	27%
27.	26	19	73%	9	3	33%	17	16	94%	35%
28.	17	8	47%	6	0	0%	11	8	73%	35%
29.	24	16	67%	9	2	22%	15	14	93%	38%
30.	17	3	18%	6	0	0%	11	3	27%	35%
31.	23	6	26%	6	1	17%	17	5	29%	26%
32.	20	10	50%	7	2	29%	13	8	62%	35%
33.	21	11	52%	5	2	40%	16	9	56%	24%
34.	17	11	65%	4	2	50%	13	9	69%	24%
35.	12	2	17%	5	0	0%	7	2	29%	42%
36.	7	3	43%	2	0	0%	5	3	60%	29%
37.	22	6	27%	8	2	25%	14	4	29%	36%
38.	18	6	33%	8	2	25%	10	4	40%	44%
39.	16	9	56%	6	1	17%	10	8	80%	38%
40.	17	14	82%	2	1	50%	15	13	87%	12%
MEAN	17.250	8.775	49.575	5.725	1.725	31.974	11.525	7.050	60.125	32.950
S.D.	5.602	5.067	19.945	2.579	1.761	31.829	4.266	4.231	22.921	12.223

TABLE II. THE 101 KINDS OF TREES LISTED BY 40 PERSONS IN A FREE-RECALL TASK.

	Times listed	Times recognizable		Times listed	Times recognizable		Times listed	Times recognizable
acacia	1	0	grapefruit	13	2	pine	34	31
apple	34	17				mountain pine	1	1
apple blossom	2	1	hawthorn	1	0	northern pine	1	1
apricot	2	0	hazelnut	1	0	Norwegian pine	1	1
ash	3	1	hemlock	5	0	Scotch pine	1	0
aspen	3	3	hickory	4	2	pineapple	1	0
			shaggy-bark hick.	1	1	plum	8	2
balsa	2	0	smooth-bark hick.	1	0	purple plum	1	1
banana	15	6	holly	3	3	poplar	5	2
beech	2	1	honeysuckle	2	0	tulip poplar	1	1
beechnut	2	0						
beechwood	2	0	Judas	1	1	red fern	1	0
birch	31	19	juniper	1	0	redwood	20	15
white birch	4	3				rosewood	2	0
blueberry	1	0	lemon	21	2	rubber	4	2
			lilac	2	2			
cedar	8	1	lime	1	0	sandalwood	1	0
cherry	36	18	locust	1	1	sassafras	1	1
chestnut	17	5				sequoia	4	3
cocoa	2	1	magnolia	7	5	spruce	17	9
coconut	10	5	mahogany	4	0	blue spruce	8	7
cork	1	0	maple	33	19	Norwegian spruce	1	0
crabapple	3	1	Japanese maple	1	1	spider	1	1
cypress	1	1	silver maple	2	2	sumac	1	0
			sugar maple	2	1	sycamore	6	1
date	2	1	mimosa	2	2			
dogwood	27	20	ming	1	1	tai	1	1
			mulberry	1	0	tamarack	1	1
ebony	2	0				tangerine	1	0
elm	15	8	oak	37	23	teak	1	0
Chinese elm	1	1	[acorn]	1	0	tulip	2	1
eucalyptus	7	0	cherry oak	1	0			
evergreen	13	12	white oak	1	1	walnut	15	5
			olive	2	1	willow	13	11
fig	9	3	Russian olive	1	0	pussy willow	1	0
fir	10	7	orange	27	4	weeping willow	8	8
Douglas fir	4	3						
fruit	2	0	palm	25	23	yew	1	0
			peach	21	2			
ginkgo	3	3	pear	21	5	Totals	690	351

Though not deriving from the data presented here, two additional points should be mentioned. First, the informants may be unable to recognize a kind of tree in their lists, and yet they can arrange their segregates into taxonomies,[2] use them in descriptions of landscapes, and wield them in figurative language. Thus, in many cases, it is *only* the recognition aspects of referential meanings that are lacking. Second, even when informants cannot recognize a tree in their lists, they attribute their inability to do so to their own ignorance and presume that some-

TABLE III. THE MOST FREQUENTLY LISTED AND RECOGNIZED SEGREGATES.

The 20 most frequently listed segregates			The 20 most recognizable segregates		
1. oak	37	(23)	1. pine	31	(34)
2. cherry	36	(18)	2. palm	23	(25)
3. pine	34	(31)	3. oak	23	(37)
4. apple	34	(17)	4. dogwood	20	(27)
5. maple	33	(19)	5. birch	19	(31)
6. birch	31	(19)	6. maple	19	(33)
7. dogwood	27	(20)	7. cherry	18	(36)
8. orange	27	(4)	8. apple	17	(34)
9. palm	25	(23)	9. redwood	15	(20)
10. pear	21	(5)	10. evergreen	12	(13)
11. lemon	21	(2)	11. willow	11	(13)
12. peach	21	(2)	12. spruce	9	(17)
13. redwood	20	(15)	13. weeping willow	8	(8)
14. spruce	17	(9)	14. elm	8	(15)
15. chestnut	17	(5)	15. blue spruce	7	(8)
16. elm	15	(8)	16. fir	7	(10)
17. banana	15	(6)	17. banana	6	(15)
18. walnut	15	(5)	18. magnolia	5	(7)
19. evergreen	13	(12)	19. coconut	5	(10)
20. willow	13	(11)	20. walnut	5	(15)

r_{rho} = .516 (significant at p = .01, one-tailed

one (an expert) could recognize the tree. They do not question the validity of the category itself, nor do they regard it as a foreign category.

There are two obvious extensions of this kind of research among American informants. In the first case, it would be interesting to see if the discrepancy between linguistic competence and recognition ability (about 50%) varies according to occupation, residence, or other social factors which may influence informants' familiarity with and need to communicate about the domain of trees. Second, it would be interesting to see if the 50% recognition rate varies if the domain were kinds of furniture, automobile parts, or printed matter instead of trees. Both projects would tell us more about American cultural foci by using "loose talk"—quantified as the percentage of recognizable segregates relative to the total listed in a free-recall task—as the measure.

LOOSE TALK IN COMPARATIVE PERSPECTIVE

The sort of discrepancy between linguistic competence and recognition ability described and documented above for American informants is not reported in any literature I have read concerning the folk botanies of more close-to-nature peoples. Others have noted the American case (e.g., Chambers 1973, cited in Dougherty 1978; Berlin 1972:83-84), but the phenomenon does not figure prominently in reports on small-scale, nonliterate, subsistence peoples.[3]

One possible explanation for the apparent uniqueness of American culture is that the phenomenon of loose talk has gone unnoticed among the Tzeltal or Karem or Aguaruna owing to the methods of ethnoscience. In the usual nonliterate research situation, the anthropologist learns the native classification system through an interplay between native terms and the natural objects to which they refer. Because the referent objects are part of the elicitation procedures, discrepancies between namable and recognizable do not arise. Hence, only future research in which loose talk is studied as a special topic will decide whether American culture (complex societies) genuinely differs from simpler sociocultural systems in this regard.

However, given the larger concerns of ethnoscience—the relations among language, thought, and culture—it seems plausible to regard the absence of reports on loose talk among various peoples not as a "failure" but as an accurate, though negatively phrased, reflection of the ethnographic facts. If this be granted, then we are left with a second and more interesting interpretation for the apparent uniqueness of American culture: loose talk is more common in complex sociocultural systems than it is in simpler systems, at least in domains pertaining to the natural environment.

If this second interpretation is correct, then we would have one more criterion with which to differentiate societal types. But, we would have no explanation for why societies differ in this regard. Moving toward such an explanation, the first question to ask is what social factors might account for the maintenance of recognition abilities among close-to-nature peoples in contrast to the breakdown of these abilities in more complex societies. Answers to this first question will likely involve differences in both the ways people learn about their environments and in their motivations for learning. For example, a tropical forest gardener learns about his natural environment through long years of apprenticeship motivated by survival needs. By contrast, many Americans learn what they know about nature through picture books and television programs and as a hobby.

The second question is why people who do not live close to nature would bother to learn and retain the names for environmental categories they cannot recognize. The data from the American sample show that this is the case for approximately half of the kinds of trees informants listed in free recall. An obvious proximate cause for the persistence of unrecognizable category labels is the prevalence of written language in modern society. People learn names for things and even a considerable amount about them without ever encountering a concrete example. Theirs is a purely semantic knowledge, obtained through words and extending no further than words. They learn a system of differences, the essence of language in de Saussure's (1966) view, without also learning how to relate the categories to referent objects. However, "survivals"—linguistic or artifactual—may lose their original functions without losing their meanings (Linton 1936). To understand loose talk as more than merely anachronism or evidence of language "devolution" (Berlin 1972), we need to consider the general function of language in human social organization through evolutionary history.

THE FUNCTION OF LANGUAGE IN HUMAN SOCIAL ORGANIZATION

The maintenance of any life form depends upon and may be defined as the "repetitive production of ordered heterogeneity" (phrase attributed to Rollin D. Hotchkiss). This, in turn, depends upon the ability to store, retrieve, acquire, and transmit information (Gatlin 1972).

Looking at the whole array of life on Earth, there are three major types of information storage-processing systems, each having its own means of storing, retrieving, acquiring, and transmitting the information necessary for biological survival (Sagan 1978:21-49):

1. *Genetic storage systems.* In these, information is stored in the complex biochemical codes of DNA and RNA, retrieved through protein production, acquired through mutations and subsequent selection, and transmitted through reproduction.
2. *Extragenetic storage systems.* With this kind of system, life forms are able to learn in their own lifetimes. The basis of this capability lies in the development of a complicated neurological system rather than depending on DNA and RNA directly.
3. *Extrasomatic storage systems.* In this type of system, information is stored outside the body of an organism itself, and there are two varieties:
   A. extrasomatic storage accomplished through a social division of knowledge which, in turn, depends on being able to access the information stored in other organisms [not discussed in Sagan]; and
   B. extrasomatic storage accomplished through changes wrought in portions of the nonliving world, i.e., in the fashioning of artifacts such as books, magnetic tapes, and laser discs.

As species develop higher forms of information storage systems, the overall storage capacities expand dramatically. The amount of DNA and RNA in a living thing is finite. If, however, that living thing can learn from its experiences and retain that information in its nervous system, then the organism's total information capacity is much, much greater. And, if the organism can store additional information on "talking leaves," the storage capacity is astronomical. Today, human societies have all three types of systems, but this has not always been the case.

By the time of the australopithecines, our ancestral hominids had developed remarkable neurological systems. However, they had only a rudimentary division of labor, probably not even based on sex (Jolly and Plog 1979: 179-213), and each animal had to solve its own survival problems. There was very little social differentiation beyond age, and they did not have language, though there is good reason to believe they had some form of call and or gesture signaling. By the Upper Paleolithic, it seems certain that our ancestors had a well-established, though by today's standards minimal, division of labor, and they had begun to speak languages.

Combining all these considerations, we come to our first speculation on the relation between language and social organization.

SPECULATION 1: *Language (symbolic communication) and the division of labor in society are mutually reinforcing—together, they make possible a Type A extrasomatic information storage system.*

Before the development of a sophisticated communication system like language, a society's total store of information would be roughly equal to that stored in any given individual. But, with both a social division of labor (and knowledge) *and* the means for accessing what other people know, the total information stored in a society of individuals becomes much greater than can be stored neurologically in any one person. This is the advantage of symbolic communication: it makes possible more complex social organization. And, it is through our social organization that small, relatively weak, naked apes managed to survive, multiply, and eventually become a dominant species over large portions of the Earth.

By extension and refinement of this line of thinking, we come to our second speculation on the social function of language.

SPECULATION 2: *The greater the division of labor in society, the less redundant is the information stored in each individual and, therefore, the greater the importance of language as a means of accessing what other people know.*

This second speculation has an ironic corollary, bringing us back full circle to the phenomenon of loose talk.

COROLLARY: *In very complex societies, it is more important to know how to talk about something than it is to know what one is talking about.*

Recognition ability and other more pragmatic aspects of referential meanings are relegated to specialists, but the means of accessing their specialized knowledge remains a general prerequisite for the nonspecialist. Here, it is worth remembering that Durkheim (1933) thought all societies had "collective representations"—standardized modes of portraying matters among members of a society—but only those societies with a low degree of societal differentiation (division of labor) could maintain a commonality of mores and deeper meanings, a "collective conscience." Loose talk, it seems, is a means of maintaining organization amidst societal diversity.

CONCLUSIONS

The image underlying the above speculations is that human society is a complex form of information storage-processing system. Symbolic communication (language) makes possible rapid transmission of information among members of a society. This, in turn, makes possible a complex division of labor, thereby vastly increasing the population's information storage capabilities and expanding their adaptive repertoire. Fortunately, these speculations give rise to empirical hypotheses, else they might remain idle speculations.

The most general hypothesis concerns the relation between division of labor and the average vocabulary size of the society's members: the greater the division of labor in society, the larger the vocabulary size of the average person.[4] The problem with this first hypothesis is that vocabulary size is a very difficult thing to measure (Burling 1970:161). In addition to requiring extensive and subtle knowledge on the part of the researcher, it is unclear whether we are asking about (1) the number of words an informant recognizes as familiar when presented with them; (2) the number of words an informant can define when asked from a word list; (3) the number of words an informant uses habitually in his or her speech; or (4) the percentage of a language's dictionary entries an informant knows in one of the above senses.

Kroeber (1948:230-231) argues explicitly against the first hypothesis. He estimates that the average speaker of any language knows roughly 10,000 words and that intrasocietal variation is greater than intersocietal. Burling (1970:161) concurs with this relativistic view of the matter. More recently, Berlin suggests (perhaps) the contrary view when he says there is a "general correspondence . . . between the number of categories encoded at any point in time in a particular language's history and degree of sociocultural development" (1972:51). Here, however, the claim is made with respect to the lexicon of a language rather than the vocabularies of speakers of that language. Hence, Berlin's observation may have no bearing on the hypothesis as phrased.

Given the ambiguities of terms and the lack of clear evidence, it is perhaps prudent to say only that the first hypothesis warrants further investigation. The matter is compounded if one takes into account details of a speaker's social status, for example, Bernstein's (1964) idea of elaborated and restricted codes.

The second hypothesis arising from the previous speculations is that as the division of labor in society increases, the number of recognizable categories of the natural world relative to the number of categories known linguistically by the *average* society member decreases. That is, the greater the social differentiation, the greater the amount of loose talk. If the average American's knowledge of the natural environment is accurately reflected by the sample of 40 college students, then a 50% recognition rate would characterize very complex, highly differentiated societies. If the Aguaruna have a 90%-100% recognition rate, then that would characterize relatively homogeneous, subsistence societies. Other societies, having different degrees of societal differentiation (e.g., peasant), should fall somewhere in between these two extremes. This is a testable hypothesis, and the method for collecting relevant data has been described and applied in one case.

The presumption behind all this is that loose talk is not merely idle, spurious, quaint, or pretentious. Rather, even loose talk has a social function. If talk is a means of ordering the world in one's thought, then loose talk is a means of organizing social knowledge lying beyond the grasp of an individual.

NOTES

Acknowledgments. A version of this paper was presented at the 22nd Annual Meetings of the Northeastern Anthropological Association, March 20, 1982, at Princeton University. I thank the students of my Anthropology 376 classes for providing more complete data against which to check the cursory method used here, and I especially thank Catherine M. Cameron for her gracious help in collecting data for this paper.

[1] The reader will note that not all of the informants' segregates in Table II fit within the typical American conception of a tree, for example, "pineapple." This only supports the main point, which is that Americans do not know very much about this domain.

[2] Collecting taxonomic classifications for kinds of trees has been a class project in several of my courses. The results corroborate that informants frequently know class inclusion and contrast relations even for their unrecognizable segregates.

[3] Brent Berlin tells me (personal communication) that his Aguaruna informants vary both in the extensiveness of their ethnobiological knowledge and in their habitual classifications. For example, women tend to know more about horticulture, men know more about things of the forest, and older people know more than youngsters. Allowing for this simple division of expertise by sex and age, however, he estimates that an average Aguaruna adult male, for example, may well know (name and recognize) nearly 100% of the bird species in his environment, a much greater recognition rate than is typical of average Americans. Generally, he feels Americans are peculiar in the magnitude of their environmental ignorance.

[4] The hypothesis says nothing about the possible relation between vocabulary size and intelligence. This is another matter entirely, and it is in response to this issue that Kroeber (1948) argues his relativistic position on vocabulary size.

REFERENCES CITED

Berlin, Brent
1972 Speculations on the Growth of Ethnobotanical Nomenclature. Language in Society 1:51-86.

Bernstein, Basil
1964 Elaborated and Restricted Codes: Their Social Origins and Some Consequences. *In* The Ethnography of Communication. John J. Gumperz and Dell Hymes, eds. Special Publication of American Anthropologist 66(6,2):55-69.

Burling, Robbins
1970 Man's Many Voices: Language in Its Cultural Context. New York: Holt, Rinehart & Winston.

Chambers, Ann
1973 Trees, An Investigation of the Ethnobotanical Knowledge of Bay Area Cali-

fornians. Manuscript, University of California, Berkeley.
de Saussure, Ferdinand
1966 Course in General Linguistics. Wade Baskin, transl. New York: McGraw-Hill.
Dougherty, Janet W. D.
1978 Salience and Relativity in Classification. American Ethnologist 5:66-80.
Durkheim, Emile
1933 The Division of Labor in Society. George Simpson, transl. New York: Macmillan.
1965 The Elementary Forms of the Religious Life. Joseph Ward Smith, transl. New York: The Free Press.
Gatlin, Lila L.
1972 Information Theory and the Living System. New York: Columbia University Press.
Jolly, Clifford J., and Fred Plog
1979 Physical Anthropology and Archaeology. 2nd ed. New York: Knopf.
Kroeber, Alfred L.
1948 Anthropology. 2nd ed. New York: Harcourt, Brace.
Linton, Ralph
1936 The Study of Man. New York: Appleton-Century-Crofts.
Sagan, Carl
1978 The Dragons of Eden: Speculations on the Evolution of Human Intelligence. New York: Ballantine Books.

Perceptual Distances and the Basic Color Term Encoding Sequence

RICHARD K. SUN
Department of Anthropology
Northwestern University
Evanston, IL

The order of appearance of basic color terms in languages, as found by Berlin and Kay (1969) and modified by later research, is largely unaccounted for. This paper reports a correlation that may shed light on the encoding sequence of basic color terms. The reader is referred to Berlin and Kay (ibid.) and Kay and McDaniel (1978) for discussions concerning the naming of the "universal inventory of eleven color categories," including "primary," "derived," and "composite" types.

We need to carefully define "encoding" and "basic color term." Normally in the literature the process of basic color term addition to a language is defined vaguely as the breakdown of composite categories into their component primaries and the subsequent naming of derived categories. Here, "to encode" means "to assign a basic color term to a noncomposite category, such that a one-to-one correspondence exists between category and name." The definition is useful in that it is explicit and conceptually equivalent to the "breakdown" definition; to break down a composite implies a simultaneous naming of its primaries. In addition, the definition allows the possibility of recognizing derived color categories in basic color terms.

With the discovery that derived categories in languages can become encoded before all the primary categories are encoded (many languages have basic terms for *grey* and *brown* without distinguishing, say, the green and blue components of GRUE), the stages beyond stage IV of the traditional arrangement of color lexicon types (Kay and McDaniel 1978:638-641) become suspect. With the strict definition of "encoding" given here, however, the encoding of noncomposite categories can be conceived as occurring in three successive "waves" that may overlap. In Wave I, the neutral primary categories *white* and then *black* are encoded in a basic color lexicon by separating from LIGHT-WARM and DARK-COOL respectively. In Wave II, the hue primaries *red* and *yellow*, and then *green* and *blue*, are encoded from the former ROW (also called "macro-red" or "warm") and GRUE. In Wave III, derived categories are encoded. *Grey* tends to precede *brown* (Kay and McDaniel 1978), which tends to precede *orange*, *pink*, and *purple*, the last three in no particular order.

The three waves are illustrated in Figure 1. A horizontal arrow is read "tends to be encoded before . . .," while vertical placement of color categories represents the possibility of one wave overlapping another; that is, languages tend to have basic color terms for *black*, *white*, *red*, and *yellow* before other noncomposite categories are encoded, but certain languages may have encoded only *white*, *red*, and *yellow*, with the category *black* subsumed under a term for DARK-COOL. Thus, categories to the top and left of the figure tend to be encoded earlier than those to the bottom and right. The *tendencies* illustrated in the three-wave scheme correspond to available data better than the *absolute stages* of the traditional color lexicon typology.