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SOME SIMILARITIES BETWEEN SEMOLOGY AND PHONOLOGY
(WITH ILLUSTRATIONS FROM CHILLIWACK HALKOMELEM)

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1.1. A linguist, approaching a language with the intention of doing a "complete" description of it, is eventually faced with the problem of how to describe the semantics. As a consequence of some courses with Mary Haas, Wallace Chafe and William Geoghegan, I have been struck by a number of similarities between semantics and phonology. At first they seemed merely interesting coincidences. But the more I thought about them, the larger the number grew and the more they seemed to explain difficulties linguists have been having in producing "complete" semantic descriptions. Equally interesting is the possibility of using some of the methods of description and discovery procedures, already proven useful for phonology, in the discovery and description of semantic structures. So it may be worthwhile to set down some of these similarities and try them out on Chilliwack Halkomelem for size.

1.2. I should add that I do not have the semantic structure of Halkomelem all neatly worked out. My firsthand experience in the field with the Chilliwack dialect of Halkomelem so far amounts to only three weeks (summer 1970)(though it includes 12 two-hour sessions, transcribed, taped and file-slipped). So the Chilliwack data and any conclusions about it are still at the tentative stage. Much more material will be gathered this summer, and some of the ideas and techniques discussed will be tested more fully. The point of using Chilliwack in this

preliminary state is to see whether methods developed for discovering and describing phonological structures can be used in any way as field techniques in discovering and describing semantic structures.

2.1. Phonology can be thought of as including phonetics, phonemics, distinctive features or components, phonotactics (phonological canon), morphophonemics, and even sound symbolism. Linguists of different theoretical persuasions may combine or separate these in different ways, but most will probably agree that if all these elements are somehow described the sound system of the language will have been described. It is interesting to notice how the sound system has effects on the other major levels of language structure: morphology (via morphophonemics), syntax (via phonotactics, sentence stress and intonation changes), and semantics (via sound symbolism and the lexicon). These effects are quite often described in levels (or chapters) other than that of phonology.

Similarly the semantic system of a language clearly has effects on the other major levels of a language's structure: syntax (via changes in word or morpheme order which produce changes in meaning, and via the semantic canon or co-occurrence restrictions), morphology (via morphosememics: semantically determined classes, semantically conditioned allomorphs, etc.), and phonology (via sound symbolism and lexical shapes). These effects have almost always been described in levels or chapters other than that of semantics. This is probably one reason why many grammars of the past which lack a semantic chapter or level are nevertheless serviceable. There is enough uncoördinated semantic information scattered throughout, and of course in the dictionary or lexicon (where it is sometimes partially systematized), to enable

the linguist and student to begin to use the language, although not to think in it.

2.2. Both phonetics and semantics impinge on the real world (using "semantics" in a narrow sense parallel to phonetics from here on and retaining "semology" for the broader field parallel to phonology). Phonetics is the analysis and description of the physical sounds of language while semantics is the analysis and description of the physical meanings of language. In both cases the linguist is faced with a continuum with a myriad of possible gradations. No matter how narrow a transcription he makes, a narrower one is always conceivable. For example, Chilliwack [sxówsm] is glossed as 'soapberries' with a note that they ripen at the end of June, last about a week, grow on the roadside from Hedley to Penticton and are canned in the Okanagan by Indians. To this could be added their size, shape, color, taste (like bitter cranberries), shape of leaf and use (they can be beaten to form a white lather--for soap in the old days, or with sugar added for "Indian ice cream"). So the semanticist, like the phonetician, must set operational limits on how narrow a transcription (in general) is useful in the field. Then he should use this narrowest semantic transcription, making careful inquiry into the meanings of each morpheme in its semantic context. This gloss is the semantic version of the phonetic symbol. If a linguist has obtained all single-word glosses he can hardly expect to find much to analyze semantically. Such a transcription is overly broad and probably "emicized" according to the linguist's native language.

2.3. The similarity of distinctive features in phonology and semantic components (from componential analysis) in semology is fairly well known. All speech sounds can be described in terms of a finite

set of articulatory or acoustic features. The success of semantic features or components has only been limited because it has only been applied to a small number of tight semantic sets (domains), such as kin terms, plant terms, classifiers, verbal paradigms, etc. But the domains are similar across languages to a certain degree, and the semantic features used in a given domain are often much alike across languages. This is very encouraging. Chilliwack, for example, has among its components for kinship terms: male, female, 1 generation above, 2 generations above, same generation, 1 generation below, direct, collateral, older, and younger. These can be used to analyze the following terms: [mæɪl] 'father', [tæɪl] 'mother', [ʃwiwæli] 'parents', [sɪlə] 'grandmother', [sɪslə] 'grandfather', [sɪlsɪ'lə] 'grandparents', [ʔæɪlɪx^y] '(my) sibling', [sɪtl'ætɪ] '(her) older sibling', [sá:sək^wt] '(her) younger sibling' or [sqə'q^h] 'younger sibling' and [swiyəqə mɪlə] 'son' (literally 'male child'). Also notice that morphs are bundles of semantic features just as phones are bundles of phonetic distinctive features.

Perhaps the first step should be taking a complete inventory of the domains in a given language. Many interesting items will turn up here. For example, in doing field work at Kitamaat Village, B.C. on Xaisla Kwakiutl briefly last summer, I got the word [wa:] 'river'. I then asked for other kinds of rivers (like 'creek', 'brook', 'stream', etc.), and the first one given was [wá:xələ] 'small waterfall'. This differs from how we think of waterfalls in English and puts [wá:xələ] in the same domain probably as that containing [wa:].

In taking inventory of domains, good anthropological descriptions (if available) can provide insight and many clues to the culturally

relevant domains and probably also to some semantic distinctive features. A domain (like kinship terms, for example) may even be analogous to the set of all stops or all spirants in a language.

Next each domain should be subjected to a componential analysis. Domains with semantic features in common could be compared, and perhaps some domains could be combined (similar to categories like obstruent?). Or the division into domains may be comparable to the phonetic divisions of stress, pitch, length, consonant and vowel (except more numerous). The features involved in these phonetic divisions can only be combined into a single unified set (if at all) by very ad hoc means. So it may be that we will have to be satisfied with largely domain-specific semantic components.

There are probably several reasons why linguists have been reluctant to tackle componential analysis of all the domains in a language. There appear to be a very sizable number of domains and semantic components involved, although the number is surely finite and probably not as large as it seems. Also juggling of huge feature matrices in describing the semantic canon and combinatory changes (morphosememics) is not a prospect to be relished. However it seems to me that we could use semantic features as we use phonetic features: in rules only when they are economic and called for, and in grids showing phones (i.e. semons, probably by domains), otherwise using the phonetic symbol (i.e. gloss). In other words it is uneconomical and profitless to overuse features, either of sound or of meaning.

2.4. Another set of similarities may be found in comparing phonemics with sememics. First, what is an alloseme or a sememe? So little sememic analysis has been done that it is necessary to ask the

question. Allosemes of a single sememe are meanings¹ which are in complementary distribution in the semantic environment and are semantically similar. (An alloseme may also be the only meaning of a sememe.) Allosemes are narrow glosses (in the sense of narrow transcription), while sememes are the broad glosses from which the narrow glosses are predictable.

A single morpheme can have several allosemes, but can several morphemes also be allosemes of a single sememe? The answer is unclear. For example, Chilliwack [q'wəl] has allosemes 'cooked' and 'ripened', [x'wəyləm] has allosemes 'rope' and 'thread' and [smə'yəθ] has allosemes 'animal' and 'meat'. I have not completely determined the environments, but in all three cases they seem largely complementary ('cooked' appears with 'potatoes', and 'ripened' appears with 'blackberries' for example). The point is, speakers of Chilliwack have chosen to combine the meanings as above. In semantic domains patterning (and pattern congruity) can be seen in such combinations.




The case of a pair like the following seems different: [xəiytl] 'cold (of water, weather)' and [tə'ə'tə'aɪm] 'cold (of a body)'. Here the speakers have chosen to keep separate two similar and complementary meanings. If there are sememic or morphological reasons for it (such as pattern congruity with other animate vs. inanimate divisions) the two morphemes could be separate sememes related morphosemically (see section 2.5). If there are no such reasons they could conceivably be allosemes of a single sememe. More work needs to be done to determine which is the case here, as well as whether several morphemes can be allosemes of one sememe.²

The criterion of semantic similarity for allosemes allows one to

separate homophonous morphemes, thus preventing a lot of fast and loose play with meanings (and cognates, in historical linguistics). Descriptions which lean strongly in the direction of calling all meanings of a given phonetic form (like English [k^hæn]) merely the meanings of a single morpheme should be avoided. Semantic similarity of alloemes probably extends to the same extent as phonetic similarity for allophones. For English /t/ we have allophones such as [t^h], [t], [ɾ] (voiced flap r), and even [ʔ]. The examples of Chilliwack alloemes above seem to show similar distance. In both cases too the speaker feels the allo's to be part of the same thing (the eme).

In analyzing a narrow semantic transcription (narrow glosses) we should be faced with profuse -etic (i.e. semantic) information which is cumbersome to manipulate. As it is helpful to read up on the phonetic and phonemic systems of the adjacent and most closely related languages to prepare oneself for phonetic transcription, it is helpful to read ethnographic descriptions of adjacent and closely related cultures to get an idea of the types of cultural and semantic units most likely to be glossed. For example, I glossed Chilliwack [t'ɛmiyɛ] as 'hermaphrodite baby (one couldn't tell its sex for sure till it was about 3 years)'. On the tape I have additional semantic information. Had I read more of the ethnographic work on the area I would have known immediately that my informant was referring to a berdache. It would still be necessary to probe a little to make sure that the Chilliwack term was the same as a berdache in all respects.

One useful method of getting narrow glosses is to ask first for the native word for a given English word (one which you have reason to believe is a cultural item), and then to ask for more information on

the meaning of the native word. When getting single-word citation forms, the informant may often be able to give allosemes, meanings which are in complementary distribution according to the semantic environment and which are semantically similar. For example, after obtaining Chilliwack [sɪ'tɛl] 'basket', and [pátθɪs] or [pátθ'is] 'baby basket (about two feet long)', I next got the word [sk^wæm] referring to at least three items, 'round basket (cross section ), clothes basket (cross section ), burial basket for twins ( like clothes basket)'. I haven't yet been able to test [sk^wæm] for mutually exclusive environments determining its allosemes, but I would be very surprised if the three meanings were not semantically predictable allosemes.

It seems likely that in most instances a hearer can tell from the semantic context of the sentence, the conversation, the physical surroundings, etc. which alloseme of a sememe is meant. Where the semantic environment is not complete, the listener may have to ask, or he may have to wait till a hint occurs in later conversation. Or the context may never be completed. There can also be cases of free variation (in talking about the shape or construction of a [sk^wæm] it may not matter whether it is to be used for clothes or burial). There are also cases of intentional ambiguity: conversations where the exact meaning is unnecessary or undesired, puns, poetry or normal conversation where implications of all allosemes are desired, etc.

Some other similarities between phonemics and sememics might be mentioned here. Just as there are a finite number of phonemes, there are a finite number of sememes in any idiolect at a given time. If the number of sememes in a language (meaning that part which speakers know

in common and need for daily life) were infinite, speakers would never be able to learn their language in a lifetime, let alone by early childhood. Dictionaries would be impossible or useless. Studies have been made of the number of vocabulary items in various dialects and languages, and I believe they usually range from the thousands to the tens of thousands (never in the millions). The number of sememes is of course much greater than the number of phonemes, and this has been a deterrent to attempts at complete semantic (semological) descriptions. But dictionaries are possible and so are reasonably complete semological descriptions.

There is a distinct need to compare sememic systems of different languages. Only this can give us an idea of what kinds of structures may be found, of selections of semantic distinctive features and alloemes, of how alloemes can be grouped under sememes, and of the types of sememic inventory and types of semantic environments of alloemes. Similarly comparisons of morphosememic descriptions and of descriptions of the sememic canons of different languages are also necessary, and will also be very useful.

2.5. Morphosememics forms a very important part of the semological description of a language. It is the chapter (or level) in which meaning changes as a result of derivational processes, for example, should be described. These are often systematic, applying to large classes of morphemes and showing a high degree of semantic structuring. All other systematic alternations of sememes resulting from combination with other morphemes, other lexemes (words), or taxemes (transformations if you like) should also be described here. Notice the word systematic. Small piecemeal alternations showing no pattern or structure are probably best left to the lexicon (just as some allomorphs are).

When morphemes are attached to one another to make up lexemes (words), either derivationally or inflectionally, the meaning changes (where they occur and especially where they are systematic) should be described. When words are combined into phrases, idioms, metaphors, etc., the meaning changes should be described (especially where systematic). When morphemes, words or phrases are combined with meaningful arrangements of order (taxemes, transformations), the meaning changes (especially where systematic) should be described. Morphosememics is the place for these descriptions.

To give some examples from Chilliwack, [qa] 'water', [q^ha'm] 'to dip water, get water', [qáqa] 'drink (verb)', and [ǰqála] 'thirsty' show some derivational meaning changes which are more than just the sum of the parts ('water' > 'liquid' for example). So do [spaləq^hwftəæ] 'ghost' and [spap_ǰləq^hwftəæ] 'kind of little screech owl, called "ghosts at night"' (also see [əæt] or [əæ^th] 'night, darkness'). I believe the -p_ǰ- is infixed reduplication with a diminutive meaning, i.e., //spal(ə)-R// > /spa-pə-l(ə)/ > [spap_ǰlə]. This is even more likely if the initial [s] is the ubiquitous Salish nominalizer. Examples of diminutive reduplication are not hard to come by: [xyəxtǰ] 'trail (little road)' from [xyətǰ] 'door; road', or [mimstiyəx^w] 'kid, kids (colloquial for children)' from [místiyUx^w] (or [mIstiyUx^w]) 'person, people'. Incidentally, the latter word for 'person, people', when placed beside [smástiyUx^w] 'power of the will, spirit, Guardian spirit', yeilds a good example of morphosememic alternation.³

The following sentences and phrases are perhaps examples of morphosememics involving taxemes and lexemes:

1. [lɛt tɪ'əpɪl lɛm tə qɑ] 'Go down to the water.'
go! down (it's) going the water
2. [θiɪqʷt tə tɛmUɣʷ] 'digging a hole in the ground, digging post-
digging the earth holes; digging the earth'
3. [swiyəqə mɪlɔ] 'son'
male child
4. [lɛ tUxʷ sθ'am ʔə'l] 'He (or she) is bony, skinny.'
(s)he's all bone left

The resultant meanings are more than just the sums of the literal parts. For example, sentence #4 could I think only be taken literally if said of a skeleton. The meanings of the individual lexemes have been combined, assimilated or simplified to produce the new meanings above.

It is interesting to notice the many parallels between morphophonemics and morphosememics. We can almost take statements about morphophonemics, substitute "sem-" for "phon-", "meaning" for "shape", "shape" for "meaning", and "sememic alternant" for "allomorph" and have workable statements about morphosememics.

The branch of grammar which deals with the phonemic shape of morphemes, words, and constructions, without regard to their meaning, is morphophonemics. (Hockett 1942, p.107 in Joos 1966).

The difference in the phonemic shape of alternants of morphemes are organized and stated; this constitutes morphophonemics. (Hockett 1947, p.230 in Joos 1966).

Morphophonemics ...[covers] every phase of the phonemic shape of morphemes: the typical shapes of alternants, the types of alternation, and the various environmental factors (phonological or grammatical) which elicit one alternant or another of those morphemes which appear in more than one shape. (Hockett 1950, p.315 in Joos 1966).

One way to make simple statements of variations within a series is to select one allomorph of each morpheme as a base form. Then the other allomorphs can be considered as resulting from describable changes from this base form under certain statable conditions. Thus, parallel changes in a number of morphemes can be described at once. Sometimes it is necessary to append a

list of morphemes to which the description of changes applies. Changes of this sort are called morphophonemic changes. (Gleason 1961, p.82).

Many of the morphemes have parallel sets of allomorphs with similar conditioning. It is, therefore, possible to make certain general morphophonemic statements which apply quite universally in the system. (Gleason 1961, p.116).

Within morphophonemics processes such as consonant cluster simplification, assimilation, vowel harmony, and ablaut are described. Some of these have parallels in morphosememics: sememe cluster simplification (see sentences #1 and #4 above), assimilation, and perhaps concord (agreement in gender for example). Also within the realm of morphophonemics is the description of phonemic canon (permitted clusters, syllabic structure [parallel to phrase structure in morphosememics?], and the distribution of phonemes otherwise). Often called phonotactics, it is often given a separate chapter however. The description of the sememic canon may likewise be best treated in the morphosememics.

Chafe has shown (1970a, 1970b) that the meaning of a sentence as a whole is not an ordered sequence of semantic elements but an unordered amalgam. However there is still a need for a description of patterns of sememic distribution within the sentence and smaller units. This is the sememic canon (or co-occurrence restrictions or semotactics--to name some synonyms). (Chafe 1970a is a particularly excellent and complete treatment of Onondaga morphosememics, including the sememic canon.) My field work has not proceeded far enough yet to reveal any clear patterns to cite as Chilliwack examples. But this section would probably include treatment of things like which classes of sememes can occur alone as complete utterances, which classes have defective distributions, and which classes or sememes are mutually exclusive (negative assertions and their positive counterparts in the same sentence for example).

2.6. There are some additional elements needed to complete a semological description. Sound symbolism and onomatopoeia directly link semantic elements with phonetic ones. For example, Chilliwack has: [q'a:w] 'howl', [yæ't^h] 'vomit', [p^ha't^h] 'blow', and [hǣʃuw] 'sneeze' (all four are verbs), [x^wáttas] 'heavy' beside [wáwa f x^wáxwá] 'light(weight)', and [sæ'səxəm] 'bitter; sour' beside [q'æ'q'ət'əm] 'sweet'. When these links are systematic they should be described in the grammar (when they aren't systematic they can be mentioned as interesting phenomena but are best catalogued in the lexicon). Also providing a direct link between phonetics and semantics are intonation and rhythm (for example super-lengthening). For example, in Chilliwack:

5. 6 4 4 3 2 (intonation)
[li^ə qəx tə k^wə'áp] 'Are there many apples?'

6. 32 5 4 2 1
[li^ə qé:ːx tə k^wə'áp] 'There are an awful lot of apples!'

Such patterns should be fully described in the phonology and semology.

Meaning is also affected by things like "tone of voice", style switching, and other sociolinguistic effects. Irony is the communication of a meaning opposite from the literal statement, through the use of such sociolinguistic effects. These should be described in a full grammar, perhaps in the semology, perhaps in a chapter on sociolinguistic phenomena.

3.1. It is not my intent to suggest that semological phenomena are parallel to phonological phenomena in every respect. I have suggested one or two differences and there are surely more. But the number of parallels and their extent are remarkable. I believe these similarities can be of great help in field work and in working out a respectable semological description of a language.

The data from Chilliwack are not presented as conclusive proof of anything; they are far too tentative for that (semantically and even phonetically). I have given phonetic forms throughout. The Chilliwack is cited merely to show how the ideas might be applied. It is hoped that readers more expert in Salish linguistics can correct, add to, and perhaps amplify my examples from their own experience.

The theoretical orientation used is somewhat stratificational, but the similarities can be found and used in other frameworks as well, I believe. The advantage of stratificational description is that in describing linguistic structures and processes it errs on the side of overdifferentiating levels if anything. I have no objection to using transformations if there is solid evidence for them in the language, but I agree with Chafe (1970a, 1970b) that whatever deep structure exists is semantic (semological) rather than syntactic.

3.2. The question of psychological reality naturally arises with any theory of semological structure. In a discussion with a friend in experimental psychology, Robert Montgomery, we happened on a theory which seems to explain a number of things about semantics and memory. I do not know whether the theory has already appeared in psycholinguistic or psychological literature or whether it is merely our idea. At any rate it fits the present semological theory quite well.

A recent experiment (for which I regretably have no reference) involved training rats to go through mazes. Then chemicals were extracted from the relevant portion of the brains of the trained rats and injected into the same part of the brains of untrained rats. One chemical in particular was isolated which had the precise effect of allowing any untrained rat to learn many times quicker than ordinary rats how to go

through the maze. The particular chemical was not found in the brains of rats untrained on the maze. The success of this and several other similar experiments leads us to wonder whether the key to learning and memory is not chemical production. Others have felt similarly persuaded and articles have even been written on the future possibility of learning by pill.

Without speculating about pill-learning, suffice it to say that it seems likely that learning a new meaning or concept involves the electrochemical creation of a new chemical. This chemical is probably dissipated or possibly destroyed or inhibited by a chemical whose function is to destroy or neutralize such new chemicals after a short period of time. This would explain short-term memory. Many systems in the body operate this way, with a set of catalysts and anti-catalysts, including notably the transmission of messages across nerve endings.

But when the new meaning is encountered again a number of times, the new chemical is created each time, and soon there is enough of it (or a mutation is developed which resists the inhibiting chemical) so that the new chemical remains. This would be long-term memory. The new chemical further would have a structure allowing it to react or join with certain others. This inter-reaction is thinking, allowing us to relate ideas and meanings. Senility, like many other breakdowns of old age, could merely be failure to produce new required chemicals, or could be overproduction of the inhibiting chemical.

Of course it is premature to relate alloemes or semantic components to chemicals. The idea above is merely presented as an interesting possibility. It is not crucial support for the similarities observed between phonology and semology. Those similarities will stand or fall when measured against semantic structures and semological descriptions of real languages.

NOTES

1. One should say "meanings of a morpheme" here if it is shown that separate morphemes cannot be alloemes of a single sememe.
2. The fact that there is some kind of reduplication in the second word and none in the first leads me to believe that the words are different morphologically. The pattern of reduplication is common in verb inflection: $C_1V_1C_2V_2C_3$ for example is reduplicated with an infix, $-C_1\bar{e}$, i.e., $C_1V_1C_1\bar{e}C_2V_2C_3$ (as in [tæq'æt] 'put it down', [tǣtæq'æt] 'putting it down'). The root in [tə'a'tə'at̃] (probably tə'a't̃) is cognate with Kuipers' (1969) Proto-Salish *c'u/aλ 'cold' (since Chilliwack [t̃] and [t̃̄] are allophones of /t̃/ and since -̃ appears to be a suffix). At any rate, it seems best to treat the Chilliwack pair cited not as alloemes but as separate sememes. If further investigation shows that they are in complementary distribution in the morphology and alternate systematically with each other, then they can be described as sememes of a single morphosememe. It may be that one occurs only with particular morphemes or particular grammatical categories or particular grammatical constructions. Or it could be determined partially by sememic environment and partially by grammatical or morphological environment. A similar case may be the two verbs [mæqæ] 'snow₁' and [syfyæq] 'snow₂'. My first informant has not been able to remember how these differ in meaning or in use (morphologically).
3. A method is needed to distinguish narrow (semantic) glosses from broad (sememic) glosses and from morphosememes. One possibility is:

semantic	['narrow gloss']
sememic	/'broad gloss'/ or /'alloeme, alloeme'/
morphosememic	//'morphosememe'//

 (as for example: // 'screech owl' // < / 'screech owl' ~ / 'little ghost' / and / 'screech owl' / < ['kind of little screech owl which lives in ..., sounds like ..., and is very elusive and hard to see']).

BIBLIOGRAPHY

- BASSO, KEITH. 1968. "The Western Apache classificatory verb system: A formal analysis,"
- BERLIN, BRENT and DENNIS E. BREEDLOVE and PETER H. RAVEN. 1968. "Covert categories and folk taxonomies," AA 70.290-299.
- BERLIN, BRENT and A. KIMBALL ROMNEY. 1964. "Descriptive semantics of Tzeltal numeral classifiers," AA 66, #3, pt.2, 79-98 (in *Transcultural studies in cognition*, ed. by A. Kimball Romney and Roy G. D'Andrade).
- BLOOMFIELD, LEONARD. 1933. Language, Holt, Rhinehart & Winston, New York.
- BRIGHT, JANE O. and WILLIAM BRIGHT. 1965. "Semantic structures in northwestern California and the Sapir-Whorf hypothesis," AA 67, #5, pt.2, 249-257.
- CHAFE, WALLACE L. 1970a. A semantically based sketch of Onondaga, (IUPAL, no.25), Supplement to IJAL 36, #2, April 1970.
- CHAFE, WALLACE L. 1970b. Meaning and the structure of language, University of Chicago Press, Chicago.
- CONKLIN, H. C. 1955. "Hanunó color categories," SWJA 11.339-344.
- CONKLIN, H. C. 1962. "Lexicographic treatment of folk taxonomies," in F. W. Householder, Jr. and Sol Saporta (eds.), Problems in lexicography, RCAFL-P no.21, Supplement to IJAL 28, #2, pt.4.
- FRAKE, CHARLES O. 1961. "The diagnosis of disease among the Subanun of Mindanao," AA 63.113-132.
- GOODENOUGH, WARD H. 1956. "Componential analysis and the study of meaning," Language 32.195-216.
- JOOS, MARTIN (ed.). 1966. Readings in linguistics I, 4th edition, University of Chicago Press, Chicago.
- KATZ, JERROLD J. and PAUL M. POSTAL. 1964. An integrated theory of linguistic descriptions, M.I.T. Press, Cambridge, Mass.
- KUIPERS, AERT. 1969. "Towards a Salish etymological dictionary," a paper delivered at the Fourth International Conference on Salish Languages, Victoria, B.C.
- LOUNSBURY, FLOYD G. 1956. "A semantic analysis of Pawnee kinship usage," Language 32.158-194.
- NIDA, EUGENE. 1949. Morphology, (2nd ed.), University of Michigan Press, Ann Arbor, Michigan.

BIBLIOGRAPHY cont.)

- STURTEVANT, WILLIAM C. 1964. "Studies in ethnosience," AA 66, #3, pt.2, 99-131 (in Transcultural studies in cognition, ed. by A. Kimball Romney and Roy G. D'Andrade).
- SUTTLES, WAYNE and WILLIAM W. ELMENDORF. 1960. "Pattern and change in Halkomelem Salish dialects," Anthropological Linguistics 2, #7, 1-32.