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The Compound Bilingual as an Agent of Language Change:
A Psychological Model of Bilingualism

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Dan Sperber (1975) has recently made a valuable contribution to the sorting out of differences and similarities between language and culture. Of the many ideas central to such a discussion, we are concerned here with the learning and use of language and culture, and we put the concepts of context and perception in a position of central importance. By "context" we mean specific situation settings, referred to here as "culture spaces", although reference is made to the meaning of a word or symbol in the general context of a language or world-view. The sort of perception we are interested in is that inherent in "reflex" judgment and interpretation, as these are often culturally determined; not in the oversimplified S-R registration of sounds and images by the brain so familiar in psychological literature.

In looking at the roles of context and perception in human life, the phenomenon of the compound bilingual takes on a special significance. The linguistic competence of such an individual is at a point where he understands and can use a second language, but experiences interference in the choice of lexical items in the second language. We maintain that the cause of this interference is not usually related to the grammar of a language, but rather to semantic categories and cultural cues in the symbolic sense (see Sperber 1975) which tell the individual what sort of judgment, interpretation, and perception of a particular situation is appropriate.

The problems entailed in any study of such semantic categories and cultural cues are well known to anthropologists. We do not, however, argue with any of the numerous, well-written, and often contradictory, anthropological works on this subject in this paper. We do take issue with the pioneers of research in this area, Susan Ervin-Tripp and Charles E. Osgood, and we are sincerely grateful for their courageous efforts on this frontier. We also thank Professor Akira Yamamoto at Kansas whose encouragement provided the vital impetus for the development of these ideas.

It is to Professor Yamamoto that we owe the term "culture space". It is a convenient shorthand for a concept that is referred to by Hymes (1962) as "context of situation", by Burke (1969) as "scene", and by J. R. Firth (1935) as "contexts of situation", but it also focuses attention on providing a means of delineating the relevant factors in the culture space for purposes of judging (by employing cognitive rules) the appropriateness of alternative responses to

stimuli in the culture space.

This paper was originally written in the fall of 1974. After several revisions, it was presented to the spring 1975 conference of the Central States Anthropological Society, and its form in this publication is essentially the same as it was at that time, although the ideas central to the paper have been further developed in the area of anthropological theory by the first author.

If we have made any progress from the starting point provided by Ervin and Osgood, it is only a glance in the direction of which we would take the next full step. In other words, this is truly a "working paper". It is also interdisciplinary, as any research in this area must be. The ideas which have converged to produce this paper are from the fields of cultural anthropology (Miller), educational psychology (Park), and linguistics (Carson and Park). Comments and questions will gladly be responded to by writing the first author at the Department of Anthropology, University of Kansas, Lawrence, Kansas 66045.

INTRODUCTION

We shall be concerned in the following with the nature of language usage among bilinguals, from the position that bilingual usage represents a special case of the relationship of language in general to the total cultural and psychological environment in which it is used. "Language-environment interaction which is psychological" refers to the relationships maintained between two languages in the mind of the bilingual speaker (Haugen, 1971:325). The general organization of thought which enables the individual to respond to his environment effectively and appropriately is cultural.

We begin by describing the various phenomena which are manifested when two not highly similar codes are potentially operative within the cognition of a single individual. These phenomena: interference, code-switiching, and borrowing testify to the cognitive interaction not only between the languages in question, but also between the languages and the physio-temporal spaces in which they are used. We will formulate in a general way a model of the bilingual speaker-hearer which illustrates the theoretical point of view of this inquiry. In the last two sections, we will 1) use our model as an explanation of languages in contact, and 2) give evidence from naturalistic observation to support it.

Any model of the bilingual speaker-hearer employing his languages within a natural socio-cultural milieu must be subject to the known variables pertinent to the individual concerning bilingual usage. These are language dominance (the relative proficiency the speaker shows in each of his languages), the manner in which the languages were learned[1], the age at which they were learned, the attitudes of the speaker towards each language, and the specialization in the use of each language by topics and interlocutors - the speaker's choice as to where, when and with whom to use each of his languages (Weinreich, 1968:3).

The speaker's attitudes towards his languages as well as language special-
ization by topic and listener are the societal variables which effect the
occurrence and frequency of code-switching. Code-switching occurs when a
speaker makes an intentional shift from one of his languages to the other to
agree with the physio-temporal spaces[2] in which he is operating. The frequency
and extent of code-switching along with language dominance and the age at
which the languages were learned, as well as the degree of structural differ-
entiation between the languages determine the nature and extent of interfer-
ence. Interference occurs when the speaker's utterance in one language
deviates from the norms of that language as a result of his knowledge of
another language (Weinreich, 1968:1).

An explanation of the processes of both codeswitching and interference
which will serve to predict the occurrence of these phenomena rests on the
theoretical relation of the unit of expression to a unit of content.[3] In
this regard, Ervin and Osgood (1954), drawing from Weinreich's earlier tri-
partite schema, distinguish between two types of bilinguals: coordinate,
where interference is minimized, and compound, where interference is frequent.
In the following paragraphs we will present their position.

The coordinate bilingual maintains two separate representational systems,
one for each language. Each expression system is defined as being structur-
ally and isomorphically related to its own meaning system. Ervin and Osgood
operationally define the coordinate bilingual as one who learned and used
both languages in totally different social situations. Ideally, coordinate-
ness in a bilingual individual is the product of having learned the two lan-
guages within the natural cultural context of each, and at differing ages
(Ervin, 1954). The coordinate bilingual would also maintain little, if any,
interaction with other bilingual speakers. In this case initial associations
between symbols and their referents are made independently and directly for
each language. Because of the coordinate bilingual's separate meaning sys-
tems, the spoken languages are kept apart. Code-switching and interference
are minimized, but still occur.

The compound bilingual, on the other hand, maintains one meaning system
for which there are alternant modes of expression. Ervin and Osgood operation-
ally define the compound bilingual as a product, either of a paired-associate
teaching methodology, in which the known signifiers of Language-1 are used
as mediators in comprehending new signifiers of Language-2, or of a socio-
cultural milieu in which both languages are spoken interchangeably to and with
the same people. Under these conditions the occurrence of code-switching and
interference is maximized, irrespective of the degree of structural divergence
exhibited by the languages in question. Meanings and their relationships are
identical in the two languages.[4]

In Ervin and Osgood's model, structural divergence is crucial for the
prediction of coordinate bilingual interference. For this type of bilingual,
interference is most likely to occur when the languages and cultures are close-
ly related, and culture space experience with each language is alike or highly
similar. Under these conditions there is a high probability that a large
number of corresponding signs from the two languages are translation equivalents
and/or cognates. A coordinate bilingual may become a compound bilingual under
conditions of prolonged two-way translation or interpretive practice, or
habitual interaction with other bilinguals with whom code-switching is common.

As a result of translation practice, the coordinate bilingual may devise shortcuts which tend to equate signs as translation equivalents and thereby bypass the second language's meaning system as a mediator of the sign (Ervin, 1968:19).[5]

The usefulness of the Ervin-Osgood model, however, is seriously limited by a behavioristic handicap, as pointed out by John MacNamara in his article "Bilingualism and Thought" (1970). Ervin and Osgood make no distinction between denotative and connotative meaning. This problem, which appears most obviously when comparing the model with semiotic theory, has some rather awkward implications for translation, as MacNamara observes (see also Jakobovits, 1970, pp. 173-177).

In an attempt to hold to a behavioristic point of view, Ervin and Osgood suggest that differences between translation equivalents in two languages are relatively slight. We do not agree with this position. The Ervin-Osgood model does allow for elaborate connections between a coordinate bilingual's two meaning systems, but we are led to assume that these connections could do nothing more than exchange the lexical representations of the two languages which apply to the same referent. As a result, the coordinate bilingual would be able to express in English that which he heard in French, but he would not be able to compare and contrast an utterance in French with its translation equivalent in English. Another implication of this behavioristic problem is that the bilingual could not use context to select between two distinct meanings for the same term.[6]

In essence, then, the Ervin-Osgood model has the effect of cancelling out a distinction between compound and coordinate bilingualism, since two lexical symbols, one from each of the bilingual's languages, can represent the same referent, even for the coordinate bilingual. This notion of translation equivalence is a direct implication of the definition of compound bilingualism.

MacNamara holds a rather skeptical attitude towards the compound-coordinate distinction, labelling it a "conceptual artifact". We agree that it is a tool used in dealing with bilingualism, but we also maintain that it is a useful tool. The model we present is, in part, the product of an attempt to clarify those issues which become problems in a behavioristic approach to bilingualism, and to utilize the compound-coordinate distinction in an explanation of second language learning.

Our model is based on the hypothesis that the bilingual speaker-hearer maintains one meaning system for the initial categorization which produces perceptions of reality (once the information has been received through the senses), and two systems (one for each language) of linguistic categorization, or semantics, for the expression of perceptions. We maintain also that second language learning progresses through developmental stages described by 1) the structure of the perceptual meaning system and 2) the relationship of the linguistic meaning system for Language-1 to that of Language-2. These stages of language learning can be represented as existing on a continuum and marked as "subordinate", "compound", or "coordinate" as the individual's competence in the second language progresses from elementary to advanced.

The definition of "subordinate", "compound", and "coordinate" stages rests upon the explanation of the following information processing model:

Reality / / (Categorization-1 --> Perception --> Culture Space) Process A
                                                 Evaluation

L$_1$ (Categorization-2 --> Coding --> Expression)
                                                                Process B
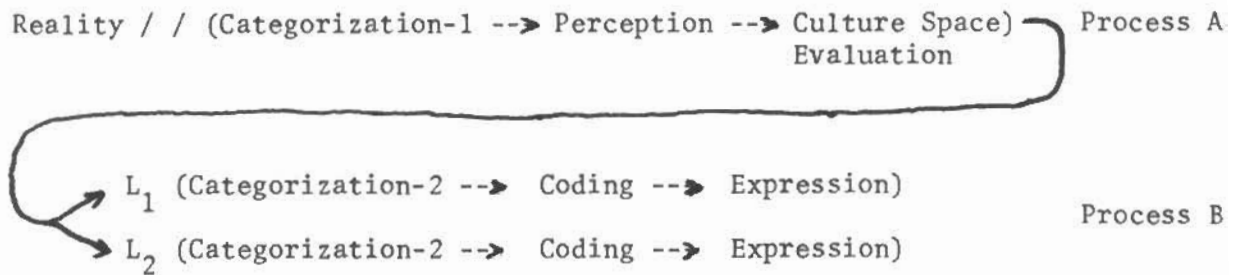L$_2$ (Categorization-2 --> Coding --> Expression)

Figure 1: An explanatory model of bilingualism -- the coordinate bilingual.

According to this schema, each individual experiences reality through an
initial categorization process (Categorization-1). This Categorization-1
mechanism has two essential characteristics: 1) it is a grid (a sort of
socio-cultural filter) through which one views elements in reality, and can
identify those elements as belonging to various domains of perception; 2) all
domains in the grid are interconnected directly or indirectly by culture-linked
semantic ties (or associational ties). The sense data obtained from reality
are, at this stage, given form and meaning in the mind of the person experienc-
ing reality, and perception - the recogition of reality as specific things,
events and ideas - is possible.

It is the Culture Space Evaluation stage which predicates the act of
perception. At this point, the perception is weighed against the culture space
knowledge of the individual. Important factors here are 1) the past experience
of the individual in culture spaces similar to the one he is now operating in,
and 2) the immediate past, i.e., the sequence of things and events in the
immediate past giving rise to the moment at hand. The perception may prove to
be harmonious or incongruous with the culture space in reality. If the per-
ception does not agree with the individual's knowledge of waht he can expect
to take place in that culture space, then he has misunderstood the nature of
the culture space, and the organization of the grid through which he is viewing
reality must be revised.

Thus, the Process A serves to re-organize the grid in accordance with
continuously changing culture spaces (the change may be very slight, but is
continuous). If the individual has misunderstood the culture space he finds
himself in, this reorganization of the grid can serve to admit new possibili-
ties and aspects to him concerning the nature of that culture space. In the
case of code-switching, it is within this Process A, at the Evaluation stage,
where the coordinate bilingual discovers which of his two languages is most
appropriate to use in forming perception of the reality being sensed. Adjust-
ments can then be made in the Categorization-1 mechanism to allow the individ-
ual to perceive inone language or the other. In this process, the same infro-
mation may be perceived and evaluated several times before the appropriate
'frame of reference' is established.

If an individual chooses to respond in some way to the reality perceived,
the 'thought' moves into the Process B. If he has correctly assessed the
nature of the culture space he is in, then his response will be appropriate.

If he has misunderstood the nature of the culture space and chooses to respond before he corrects his perceptions, then his repsonse will be inappropriate.

The thought in the Process B is, first of all, re-categorized. The Categorization-2 process modifies perceptions by organizing them into linguistically codable units. This pattern is then further modified to accord with the rules of grammar for the language chosen, and the thought is expressed.

AN EXPLANATORY MODEL OF BILINGUALISM

The Mechanism and Process of Categorization-1

Categorization-1 represents an intermediary sequence of reality interpretation between sensation and perception. Every individual interprets his sensations from reality through a grid (cultural filter) which is a meaning system representing his knowledge about the ways in which the things in the world are organized. Thus, the grid is the product of an individual's past experience in various culture spaces (through direct participation and indirect observation, e.g. television).

Domains

The grid allows the individual to perceive reality as being broken up into entities which are interrelated in specific ways. It organizes reality into categorical domains. Domain, as it is used here, means:
1) Those things, events, and ideas which can be represented by a single lexical item.
2) Those things, events and ideas which cannot be referred to by a single lexical item, but whose character may be represented by a phrase or a sentence. These will be called "overlapping domains". An example of this is the phrase: "Roland Barthes' ideas concerning semiotics". This single concept has meaning only as it is associated with other domains, such as philosophy, anthropology, psychology, and literature.

It is our opinion that hierarchical arrangement of domains is sometimes helpful, but is necessarily an artificial tool, and not a property of the domains themselves. Thus, BEHAVIORISM is a domain separate from that of PSYCHOLOGY, but interconnected with it in a given way. Componential analysis is not a subdivision of cultural anthropology, but a separate entity in the mind of the speaker-hearer, with given interrelations existing between the two domains. RED BOOK can be seen as a domain in itself. It is not primarily red, nor is it primarily book. It is the color red which is manifested in the form of a book, and it is a book which has the quality of being red. Thus, RED BOOK is an example of an overlapping domain.

Culture-Linked Semantics

All domains in the grid are interconnected by associational ties which we will call culture-linked semantic ties. For example, when one looks at a telephone, the culture-linked semantic ties with the domains NUMBERS and ELECTRICITY will probably be stronger than ties with the domains WOOL and SHEEP. The way in which the individual actually perceives the telephone is dependent upon the culture space he is operating in. The culture space

information will more or less dictate which culture-linked semantic ties are appropriate for a given situation. When an American views a bottle of wine, the ties with the domain INTOXICATION may be predominant. When a Frenchman views the same bottle of wine, the ties with the domain BOISSON would be stronger than those with the domain IVRESSE. When one looks at the color "red", the ties with the domain represented by the superordinate category COLOR will be implicit in the perception of red, whereas the perception of the texture of the thing which is red (shiny, dull, smooth, rough, etc.) will be relatively explicit in the perception. In other words, if the texture is important to the perception, then the sense data of those two features combined will be perceived in terms of an overlapping domain such as SHINY RED.

The Influence of Culture Spaces on Perception

The same objective reality is not always viewed through the same domain. During Culture Space Evaluation, rules used to determine the appropriate meaning of reality being viewed are selected from the culture space knowledge of the individual. An individual's predispositions (moral, esthetic, etc.) will come into play in how he perceives (via rule selection) and therefore reacts to the stimulii that are available in the culture space. Thus, the individual is constantly making adjustments in his Categorization-1 process to let his perceptions, and therefore his basis for reaction be more harmonious with the flow of reality he is perceiving. These rules, then, serve to guide attention selectively, and to strengthen or weaken sets of associational ties which affect the meaning of that which is being perceived.

Reality is viewed in its own unique context, as that context is defined by the knowledge of the individual concerning the culture space being perceived. Which culture space an individual chooses to perceive reality as existing in depends on the "thought pattern" of the individual as it guides attention selectively, and the judged appropriateness of anticipated responses in the culture space.

Culturally-Determined Differences in Grid Structure

This model explains culturally different evaluations of the same objective reality made by a bilingual in terms of grid structure and culture space rules available for a given culture. The meaning systems of any two different lan- guagues are rarely isomorphic with each other. Terms which are translation equivalents in two languages may not be completely interchangeable in their scope of reference. One example of this is the contrast of relationships between color terms for Portuguese and English.

Figure 2: Hypothesized grid structure for Portuguese and English monolinguals.
(⌒ = culture-linked semantic ties)
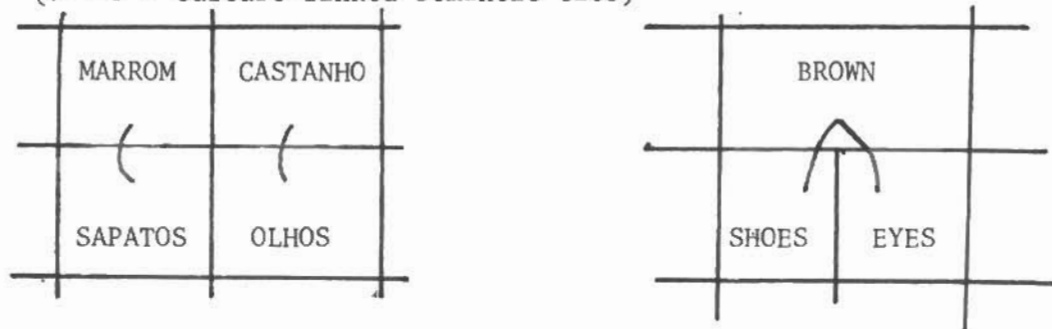
Portuguese and English speakers seem to divide the light spectrum in similar ways, but the organization of the semantic domains of the divided light spectrum is not completely identical. The domains MARROM and BROWN are translation equivalents with different scopes of reference. The same is true of the relationship between CASTANHO and BROWN. The domain represented by CASTANHO has contextual associational ties restricted to the domains OLHOS (eyes) and CABELOS (hair), whereas MARROM applies elsewhere. Sentences such as:

1) Ela tem cabelos marrons. (She has brown hair.)
2) Ela tem olhos marrons. (She has brown eyes.)

are grammatically, but not semantically, acceptable to native speakers of Portuguese. The native English speaker does not have a term for "color brown used to describe a person's hair and/or eyes".

In contrast to this case of two cultures dividing the same reality into different domains, the possibility of two distinct cultures seeing elements of reality as belonging to the same domains also exists, with those domains being interrelated via the culture-linked semantic ties in different ways. Since the culture-linked semantic ties are different for the two otherwise identical grids (grids being composed of domains interrelated by culture-linked semantic ties), these two grids can be said to be representative of two distinct cultures.

For example, the Brazilian Portuguese speaker may have a series of lunch counter food items (e.g., sanduiche, hamburgo, sundae) which are isomorphic referentially to the English terms. The domains covered by these terms, however, will not be perceived as being identical to their English counterparts because in Brazilian culture hamburgo is associated with lanches (translation equivalent: snack), but never with the idea of noon meal (almoco), whereas in American culture hamburger is associated with lunch (noon meal), but not usually with snack.

Process-A and Bilingualism

Process A in compound and coordinate bilingualism is a combination of the information necessary for perception in Language$_1$ and Language$_2$. In the case of the subordinate bilingual, perception is conducted only in terms of Language$_1$. In the compound, Process A is a fusion of the perceptual meaning systems of Language$_1$ and Language$_2$. The coordinate bilingual represents a case in which the knowledge necessary for perception in both languages is contained within the same system, which retains the ability to let the individual perceive reality in the context of each language separately through the influence of the Culture Space Evaluation stage on the culture-linked semantic ties. This results in the ability to perceive (and therefore to express one's perceptions) as a monolingual of either language would. It is the Culture Space Evaluation stage differentially strengthening and weakening the appropriate sets of culture-linked semantic ties which is responsible for the individual's ability to keep the two languages separated.

THE SUBORDINATE-COORDINATE CONTINUUM

The state of language knowledge possessed by an individual can theoretically be plotted somewhere on a continuum which ranges from subordinate

knowledge to coordinate knowledge. The model we present accounts for a distinction between subordinate and compound as being reflected in the Categorization-2 process. This Categorization-2 process involves the breaking up of perceptions into linguistically codable units, and depends entirely upon the Process A for meaning, since something that is not perceived cannot be expressed. We explain the distinction between the subordinate and coordinate states of language knowledge, on the one hand, and that of coordinate bilingualism on the other in terms of a structural difference in the Categorization-1 process related to the culture-linked semantic ties.[8]

The Subordinate Bilingual

The subordinate bilingual shows strong dominance of one of the languages over the other. In this situation the structure of the grid as well as all components of the Process A have the characteristics associated with and structured by the dominant language. The process might look like this:

Reality / / (Categorization-1 --> Perception --> Culture Space)
                                                 Evaluation

L_1 (Categorization-2) --> (Coding --> Expression)
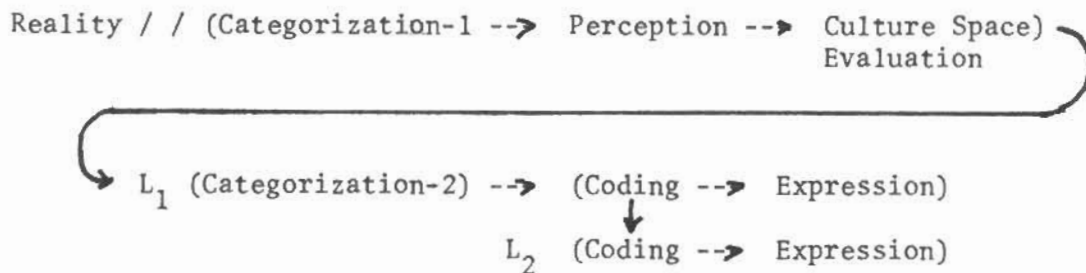
L_2 (Coding --> Expression)

Figure 3: The subordinate bilingual.

At Culture Space Evaluation, the subordinate bilingual has no choice as to 'language of thought', as the coordinate would when the culture space suggests that L_2 would be the proper mode of perception. Because the Process A is structured in accordance with his dominant language, his Categorization-2 process will only produce meanings from L_1, whether he chooses to express his idea in his dominant or his secondary language.

Subordinate bilingualism is the case where units of expression in alternate languages are made isomorphic to each other and the semantic structure of both languages is the same as that of the more dominant language. It is under these conditions that the bilingual uses his dominant language expression system as a mediator for expression of the second language. This causes the subordinate bilingual's second language utterances to look like direct translations from his dominant language. Incidences of interference will occur wherever the semantic domains of his second language are interpreted in terms of his dominant language. Thus, the meanings produced in the utterances of this speaker will be those of L_1, regardless of whether he is speaking L_1 or L_2. The relationship of Categorization-1 to Categorization-2, then, is a limiting one, since things can be expressed only as they are perceived.

The Coordinate Bilingual

The coordinate bilingual is the ideal case in which neither language dominates over the other, and the two languages are kept apart. In Process A (Figure 1), the coordinate bilingual assesses the appropriateness of language choice in relation to the culture space in which he finds himself. He then uses the language he has chosen as his 'language of thought'. The language choice in Process A determines the selection of rules which in turn act to select domains and selectively strengthen the culture-linked semantic ties in the Categorization-1 process and weaken those associations characteristic of the other language. The Process B for the coordinate bilingual, as shown in Figure 1, has the categorization and coding for expression in each language kept distinct from that of the other language.

The Compound Bilingual

Compound bilingualism represents the intermediate stage between subordinate and coordinate bilingualism. This is the case where the perceptual meaning system for L_1 is fused with that for L_2. Interference is therefore apparent in both languages. Culture space knowledge of L_1 has been applied in an adaptive fashion to be able to account for culture spaces of L_2; that is, the speaker/hearer attempts to understand L_2 in terms of L_1. Interference occurs when this adaptation of L_1 does not successfully approximate the culture space rules of L_2. On the other hand, if the culture space rules of L_1 have been expanded to such an extent that they are no longer acceptable in L_1 itself, interference will occur in L_1. As this adaptive application becomes more successful, the culture space knowledge of L_2 gradually becomes independent for L_1, and the coordinate stage of bilingualism becomes possible. Our compound bilingual does not succeed in keeping the two languages apart at Categorization-2, since they are merged at Categorization-1. He does, however, maintain separate coding systems according to the following representation:

Reality // (Categorization-1 --➤ Perception --➤ Culture Space) Evaluation

(Categorization-2) - L_1 (Coding --➤ Expression)

L_2 (Coding --➤ Expression)
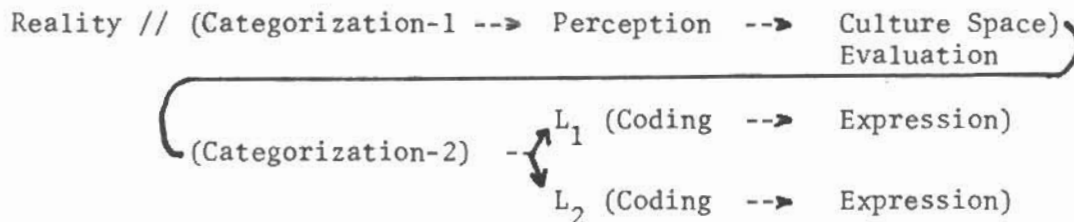
Figure 4: The compound bilingual.

Interference occurs primarily during the Process A, and has been minimized in Coding.

The subordinate-coordinate continuum, together with our information processing model, represent not only a description of the stages of language knowledge a person must go through to become 'ideally' bilingual, but also hypothesizes the process which the individual's meaning systems undergo in passing from one stage to the other.

We take the position that children who learn their languages sequentially and all adult bilinguals must pass through all stages in the second language learning process if coordinateness is to be achieved, irrespective of the cultural milieu or the method by which the second language is initially learned. Children who learn both languages simultaneously, however, will bypass the subordinate stage because, in principle, such children do not have a dominant language. The extent to which a bilingual progresses on this scale is ultimately determined by the extent to which he interacts with coordinate and monolingual speakers of the second language. If a bilingual's second language interaction is confined to less than coordinate speakers, progression will be held at the level of the speakers with whom the individual is interacting.

BILINGUALISM IN CULTURAL CONTEXTS

Large numbers of bilinguals may interact within physio-temporal spaces where at least two cultures are in contact. In these cases, the degree of interference and borrowing from one language into the other is conditioned as much by sociocultural factors (i.e., past experience in and about culture spaces) as by idiosyncratic proficiency levels of individuals (Weinreich, 1968:83).

In a given culture space a particular set of behaviors and one (or in some cases both) of the given languages are expected to be used by the speakers. Thus, rules for language usage can be expected to cover intimate, informal, formal and inter-group and intra-group relationships. There are also local constraints in the use of a language by bilingual individuals. The culture space may determine language choice in judging the appropriateness of using one code in preference over another in a given setting. Weinrich cites Raetoroman-German contact in Switzerland as a case in point. German is considered to be the language of acculturation in this case of bilingual contact. Thus, there is "a core of German unilinguals, but practically no Romansch unilinguals in the population." Romansch children learn both languages from parents who are not coordinate bilinguals. In this case the likelihood of interference from Romansch (the mother tongue) is "counteracted by the fact that the social control of speech mixture affects the two languages unequally" (Weinreich, 1968:85). Much interference in the form of lexical substitution is tolerated in Romansch, though not in German, and maintenance of Romansch is in difficulty.

Gumperz and Wilson's study (1971) of language contact at the Indo-Arian/ Dravidian border in India illustrates the case where three languages, Marathi, Urdu, and Kannada, have been in contact for at least four centuries (Gumperz and Wilson, 1971:253). In this community none of the languages enjoy a high degree of social prestige over the others. Gumperz and Wilson's analysis demonstrates a merging of these languages which has resulted in a word by word translatability among them. He hypothesizes that, "a model of linguistic competence (especially for men) must comprise a single semological, a single syntactic, and a single phonetic component and alternant sets of rules for the relation of semantic categories to morphemic shapes" (Gumperz and Wilson, 1971:271). In accordance with the model we have presented, the only difference a bilingual speaker in this situation would have to maintain between his languages to keep them apart would be that of lexical insertion during

the coding process. Categorization-1 would be the same irrespective of the
language chosen for expression. Gumperz and Wilson further show that the
direction of change is multidirectional and involves all three varieties
as a set.

The phenomenon of word by word translatability through language con-
tact can be explained by our model. Because culturally fused contexts pro-
vide interaction among bilinguals with varying degrees of proficiency we
would hypothesize that compound rather than coordinate bilingualism will
be fostered when social prestige of the language is neutral. Over long
periods of compound bilingualism the culture-linked semantic ties of the
grid will tend to become strengthened in the same ways irrespective of the
language of choice at the Culture Space Evaluation stage. The re-structured
grid of the compound bilingual will reflect a merging of both referential
and connotational meaning. Merging would cause translation-equivalents to
become true equivalents in usage by these compound bilinguals.

Lambert, Havelka and Crosby (1958) used Osgood's semantic differential
scale and paired associate learning paradigms to measure connotational
meaning differences and associative independence of translation equivalents
for English/French balanced bilingual adults. The group was stratified
according to experience in fused, separate, or bi-cultural (geographically
distinct) language contexts. The bilinguals with bi-cultural experience
showed the greatest meaning difference of translation equivalents. In the
associational independence task, however, only those with experience in
fused contexts treated translation equivalents as the "same" word. If we
can assume that people who have experience in bi-cultural and separate
(though geographically similar) contexts tend also to have greater iner-
action with monolinguals or other coordinate bilinguals than those with
experience in fused contexts, this study lends support to our compound-
coordinate hypothesis.

To illustrate culture space and topic as important factors in code-
switching we observed and tested the interaction of bilinguals--students
and professors of Portuguese at the Brazilian lunch table at the University
of Kansas--for two consecutive sessions from 11:30 to 1:30 on Fridays.
Three native speakers of Portuguese and eight native speakers of English
were present on both occasions. Two of the American speakers are professors
of Spanish and Portuguese at the University of Kansas, the other people
being students at the same university. In the first session we applied a
short form test where the subjects were asked to generate English synonyms
for a set of English words, and Portuguese synonyms for Portuguese words.
In another task they were asked to write down new words out of embedded
words (the original non-sense words could yield a minimum of three words
in each language). The tests were devised by Lambert (1955) and correlate
nicely with error on long form tests (R = +.80). The results of the tests
are summarized in Table 1 which indicates the extent of the proficiency and
language dominance. A copy of the instrument is in the appendix.

Table 1

Speaker	Native Portuguese	Native English
1.	+ 5 Portuguese	
2.	+22 Portuguese	
3.	+ 4 Portuguese	
4. (Portuguese prof.)		+ 4 Portuguese
5.		+11 English
6.		+20 English
7. (Port. prof., learned Spanish simultaneously)		+ 4 English
8.		+17 English
9.		+ 4 English
10.		+22 English
11.		+18 English

Statistical interpretation of this test is difficult because it could not be accurately timed in the situation, and because no standard scale is available for comparison. However, on both occasions those speakers who were native Portuguese together with speaker number 4 (Table 1) tended to form one interactive group, whereas native English speakers, and speaker number 1, formed a separate group. A score of +5 or less either way does not seem sufficiently large to mark the speakers as dominant in either one of the languages.

In the second session we recorded the lunch table conversation and observed code-switching happen once when a Portuguese native speaker (speaker 2) addressed the non-Portuguese-speaking interviewer. Interference from the first language (English into Portuguese) occurred once. Intrusions from English into Portuguese occurred four times for speaker number ten. In these cases the speaker, obviously English dominant, used English expressions as if set off in quotations because he was asking how to say these expressions in Portuguese (this is code-switching by our definition). Portuguese native speakers and those high in ability dominated the conversation while those low in ability (D-score more than +5 for English) did not participate much.

We feel that code-switching was kept to a minimum because of 1) the explicit rule of the table to speak only in Portuguese, and 2) the reluctance of nonproficient Portuguese speakers to participate in the interaction.

Interference Examples in Native Portuguese Speakers

All native Portuguese speakers in this study have had at least one year of active interaction with monolingual English speakers in an American community. It is safe to say from the results of the test that none of them

are English dominant. Nevertheless, all of them reported the subjective
feeling that their Portuguese has changed in some way due to their in-
creased interaction with English. All of these speakers have had experi-
ence teaching English in Brazil and are linguistically conscious about
keeping the two languages apart.

Examples:

A. The lunch table situation.

>   Speaker 4: <u>Como vão as aulas?</u> 'How are your classes going?'

>   Speaker 3: <u>Eu dropped sociologia.</u> 'I dropped Sociology.'

Native speaker explanations for this intrusion from independent informants
agreed that the use of <u>dropped</u> occurred as a loan word from English because
the idea <u>to drop a course</u> as known in the U.S. system has been a virtual
impossibility in Brazil, where 'dropping' implies withdrawing from the
course of study entirely.[9]

B. A telephone conversation between native Portuguese bilingual
    speakers.

>   Speaker 2: <u>Tive que fazer o papel.</u> 'I had to do a paper.'

The usual Portuguese rendition of this idea is Tive que fazer o <u>trabalho</u>.
This represents a case where the Portuguese sound cognate <u>papel</u> is trans-
lated directly into the Portuguese frame from the English model in which
<u>paper</u> has a broader scope of reference than does <u>papel</u> (literally something
to write on). This case is an extension of the meaning of <u>papel</u> and repre-
sents a re-organization of the semantic structure of <u>papel</u>.[10]

The informant felt she was understood only because her interlocutor
was bilingual and also understood those American culture spaces related to
writing a paper. A monolingual Portuguese speaker would have understood:
<u>Tive que escrever no papel.</u> 'I had to write on the paper.' A similar case
is described in Weinrich (citing Pap) for Portuguese immigrants in the U.S.
The word <u>papel</u> was extended to include the idea "newspaper" rather than
using the Portuguese word <u>jornal</u>.

C. Untested speaker: <u>Você não sabe   a tragédia que me preveniu
ir aí</u>. 'You don't know the tragedy that prevented me from going there.'
In this case, the sound cognates <u>prevenir</u> and <u>prevent</u> have been merged and
the usage is clearly English-based, since normative Portuguese would demand
usage of <u>impediu</u> (translation equivalent--impede). <u>Prevenir</u> covers the
idea of the English term <u>advise</u>. Thus <u>prevenir</u> has been expanded to include
part of the meaning of <u>impediu</u>.

The informants (interlocutors in this case) report that neither speaker
nor hearer interpreted the particular utterance as 'incorrect' or as a 'mistake,'

since both speaker and hearer shared knowledge of similar American culture spaces.

    D. On the street.

      Speaker 2, speaking to two Spanish/English bilinguals trying to find a store: "It should be on this side of the street because this is where they have the pair numbers." In this case the speaker used the proper syntax for English, but translated directly from the Portuguese expression numeros pares (even numbers). Par is used as a translation equivalent in phrases such as um par de sapatos (a pair of shoes). In this case par covers a more extensive range of reference than does pair and it is thus more difficult to keep the distinction in mind. The speaker realized she had made a mistake at the moment she uttered the phrase, and proceeded to correct it.

      These examples show that interference from the second language into the first occurs during interaction among compound or nearly coordinate bilinguals. It was not possible for us to obtain samples of their interaction in English. Speakers 1 and 3 stated that they never speak in English when they are together unless one or more participants in the situation is a non-Portuguese speaker and they wish to include him in the conversation. Speaker 2 agrees with this except when she speaks to a Brazilian friend who is married to an American.

CONCLUSIONS

      We have presented a theoretical information processing model which not only explains the ways in which concepts are related to their signs, but also the directionality of interference phenomena in bilinguals through the mechanism of differentially proficient stages of second language learning. These data suggest that the idea of a compound bilingual is a reality because interference occurs not only from the dominant language into the second, but also vice-versa under conditions of contact with other compound bilinguals. The instances of intrusion which we found among Brazilian Portuguese bilinguals give us the basis to formulate two hypotheses: 1) the compound bilingual can serve as an agent of language change through unintentional borrowing, or interference, and 2) that coordinate bilinguals may often intentionally borrow linguistic devices from one language to another, serving also as a potential agent of language change.

      The information processing model (Figure 1) gives us the means to formulate a generalized theory of semiotics by examining, in particular, the phenomenon of interference in bilinguals. One case in point is in the second example of interference given: Tive que fazer o papel. 'I had to do a paper.' Trabalho and not papel would be appropriate Portuguese language usage. In normal usage of Portuguese, the referent of papel is "a sheet of paper." The referent in this case, though, is that of the English word paper, as it is used by American college students. This

indicates that the referent of paper, in the Process A, was perceived in
an English frame of reference. The frame of reference being in English
would be caused by the result of the evaluation of culture spaces related
to the idea of a paper. The culture space knowledge of the individual would
suggest that the idea of a paper be perceived in an English frame of refer-
ence. The effect of all this on the utterance of a sentence that is es-
sentially Portuguese is the usage of the Portuguese sound cognate of the
English word paper.

The theory of semiotics to be derived from analyses such as this de-
fines "symbol" as the concrete lexical item, and "referent" as the domain
specified by the Process A. The meaning of a domain, both denotational
and connotational, is not only language-specific, but culture-specific
and culture space-specific. Semantic presuppositions are to be found not
only in the linguistic context, but also in the cultural context.

Notes

1. We maintain that the manner in which a second language is learned and the age at which it is learned do not imply any sort of difference in the learning process itself, although these factors may have a considerable effect on the speed with which one progresses in the learning process.

2. See Yamamoto (forthcoming) for a comprehensive definition of such physio-temporal spaces, or culture spaces.

3. The nature of this relation of the unit of expression to the unit of content is an important point in differentiating between the Ervin-Osgood model and ours, and will be discussed at greater length later in the text.

4. Again, we hold that the teaching methodology itself is not a causal factor of compound bilingualism. This notion aside, though, we are in basic agreement with this definition.

5. We agree that a coordinate bilingual may become, or at least appear to be compound if he produces "sloppy" translations. However, we also agree with Jakobovits (1970:173-174) that the opposite can also be true: ". . . continued interaction can act as discrimination training through contrast and forced differentiation and, in fact, experienced translators seem to be attuned to stylistic and connotative differences between translation equivalents to a degree not apparent in less experienced bilinguals."

6. For a discussion of problems related to anthropological understanding raised by behaviorism, and a discussion of the philosophical validity of some other approaches to understanding, see Hanson and Martin (1973).

7. i.e., the past experience of the individual in culture spaces.

8. We are postulating two categorization processes in this model: one for reality perception and one for linguistic coding because of the abundance of reported evidence in the literature of the past 70 years on word association. Cole and Gay et al. have shown, for example, that Kpelle natives associate words in ways which are almost isomorphic to an independent inclusive taxonomy describing their culture. These people, however, do not group the real objects which the lexical items represent in the same way that the lexical items themselves are grouped (Cole and Gay et al., 1971: Chapter III).

9. These speakers have not been exposed to a new system recently introduced in Brazil where "dropping" a course is now possible, without any insulting connotations.

10. Spiker (1963) has shown that the more highly similar names are in their phonemic sequences, the more the training required to use the names as discriminative operators to disambiguate ambiguous visual pairs.

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