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ABSTRACT

The instrument described in this paper investigates the models used by subjects to divide their social universe into two mutually exclusive systems of interaction. This is done by means of motion picture films which portray three geometric figures in action and elicit stories about animated beings as they move in social space from informants. The responses provide data on the relationship between language, culture, and personality. Two of the assumptions supported by the evidence are that culture is transmitted in two differential lines of transmission and that these two differential lines of transmission remain, for the mature adult, differentiated into two complementary and mutually-exclusive cognitive systems which can be identified by linguistic coding systems. The paper describes the instrument and the use of films. Details on administration, scoring, content analysis, computer use, and results are provided. Examples of full text responses are presented along with a discussion of implications and suggestions for further research. A bibliography is included. (Author/VM)

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LINGUISTIC EVIDENCE FOR
THE MATHEMATICAL STRUCTURE OF
SOCIAL ORGANIZATION

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LINGUISTIC EVIDENCE FOR THE
MATHEMATICAL STRUCTURE OF SOCIAL

ORGANIZATION: RULE ONE

By R. Cecil Westerman.

ABSTRACT

Results elicited by an instrument from two sample populations support the theoretical position that all social interaction between individuals starts with a deterministic choice between deterministic models of social interaction and stochastic models of social interaction.

This paper presents a theoretical position, describes an instrument designed to test the theory, and summarizes the results obtained by applying the instrument to two sample populations. The paper assumes that deterministic models can integrate stochastic models and not vice versa. Thus, if the use of even one deterministic model is established as a necessary pre-condition of social interaction, then no integrated theory of human behavior can be stated in a stochastic model. The theory presented in this paper maintains that all social interaction starts with a deterministic choice between two sub-sets of models for social interaction. This rule is specific, and unless man processes social interaction with this rule, the analysis of input information in a reality situation will be deficient, resulting in inappropriate social responses. The deterministic choice of RULE ONE is between deterministic models of interaction based on social differences (i.e., kinship positions) or stochastic models of interaction based on

social similarities (i.e., peer group membership). The theory provides that the same individuals in a groups, as they move through time, may oscillate between the two available models during the process of interaction. For example, members of a family do not always deal with each other as individuated persons. They sometimes oscillate to deterministic models of behavior and deal with each other on the basis of the rights and duties of kinship position. The theory states that the definitive elements of the two models are not randomly transferable from one model to the other. The "either/or" oscillation functionally subsumes into two mutually exclusive sets of rules for interaction (deterministic/stochastic) a large number of sub-sets of rules for appropriate behavior. Since the deterministic models are available, human beings do not have to know each other well in order to effectively interact. Since the stochastic models are available, human beings who do know each other well can selectively choose to ignore or modify many of the rigorously defined rules of conduct contained in the deterministic models. But social interaction is impossible between individuals who cannot process

RULE ONE.

The instrument elicits stories about actors-alike and about actors-different. The results are scored to isolate signal words and attributes that are assigned by tested subjects exclusively to stories about actors-different or

actors-alike. The results support the hypothesis that individuals do in fact define social perceptions into mutually exclusive categories on the basis of either social differences or social similarities. It can be inferred that informants (subjects) tested can organize their perceptions of appropriate social interaction on the basis of either of two contrasting schemata based on selective choices of elements (social likenesses/social differences) available in any real social situation. At any measured moment in time, tested informants (subjects) do not additively combine behaviors specifically appropriate when the social differences are the point of definition with behaviors appropriate when social similarities are the point of definition. For this reason, the instrumentally elicited data can be analyzed to define some of the rules of appropriate interaction assigned by tested informants to deterministic models (i.e., overt expression of strong emotion is permitted) as they contrast to rules of interaction with stochastic models (i.e., overt expression of anxiety is permitted).

In this paper, it is argued that the informants have performed mathematically deterministic operations to subsume into the set "rules for social interaction" two mutually exclusive sub-sets of rules (deterministic/stochastic). It is argued that the informants (subjects) tested have functionally subsumed into two mutually exclusive models for

social interaction a large number of sub-sets of rules for appropriate social interaction. These results offer one explanation of the variations found between ethnographic descriptions of ideal behavior and ethnographic descriptions of observed behavior. Descriptions of ideal behavior have been formal statements of the rules contained in the deterministic models. Descriptions of observed behavior have attempted to contain the often contradictory behaviors that must be present in groups of individuals who oscillate from deterministic to stochastic models. The results reported in this paper tend to support recent theoretical innovations which have proceeded on the assumption that man uses serial ordering to organize his social relationships. These formulations of human behavior in terms of pure mathematics can be found in psychology in the work of Piaget,¹ Miller⁵ and Newell,³⁵ in anthropology in the work of Hymes,³ Goodenough³ and Wallace,³ in linguistics in the work of Chomsky² and Bernstein.²

INTRODUCTION

It will be important to the discussion to make explicit the distinction between two broad classes of mathematical models: deterministic and stochastic. A model which does not involve the concept of probability is said to be deterministic; otherwise it is stochastic. A stochastic model is either statistical or probabilistic if its representation is from the theories of statistics or probability. As it happens, no stochastic model can be made deterministic, but any deterministic model can be made stochastic by the choice of causal distribution functions. Thus deterministic models can integrate statistical models but not vice versa. If important variables in human behavior can be expressed only in deterministic models then general theories of human behavior will require deterministic models.

The formulation of human behavior in terms of pure mathematics can be found in psychology, in linguistics,² and in anthropology.³ There is a growing body of evidence to support the thesis that man must be able to maintain a capacity for minimal distinctions that can only be described

with deterministic models. Folk classifications such as kinship terminology tend to be made in terms of four or five binary discriminations. This, of course, opens up the interesting possibility that man uses serial ordering to organize his social relationships. Chomsky⁴ and Miller⁵ have applied deterministic models to some linguistic problems and concepts with partial success. They find that when language is thought of as a special form of pattern recognition, the recognition of syntactic patterns cannot be accomplished on the basis of probability statistics.⁶ The rules of syntax are specific and unless man processes incoming sentences with the rules, the analysis of this input will be deficient, resulting in incorrect responses.

Implicit in these results is a view of man as a machine, connected into a network and equipped to make the same distinctions of the same order in describable situations. Deterministic models applied to problems of human behavior to date cannot therefore explain reality without offending our common sense observation of things as they are. This is not meant to be in any way critical of the models which are themselves an obvious descriptive advance. But models are neither true nor false. All models have a range of convenient use, and any model can be said

to be better than another if it is better with respect to any of its properties. But the ultimate extrinsic property of a model is whether it is relatively consistent with a larger theory. It would be helpful to have a deterministic model which could integrate our knowledge of Homo sapiens as an individuated self into our knowledge of Homo sapiens as a processing machine.

The instrument described in this paper measures presence or absence of deterministic and stochastic models used by subjects to divide their social universe into two mutually exclusive systems of social interaction. The greatest advantage of a mathematical model is its power to indicate the type and amount of data that should be collected while at the same time making it possible to consider the entity as a whole. It provides a logical and systematic research approach. Known mathematical theories can be used effectively and integrated with other mathematical models because of their common language. This not only provides a precise medium for communicating assumptions but makes possible the use of electronic data processing techniques.

But every model requires existing mathematical theory and a moderate degree of mathematical knowledge or sophistication. Since the models and the mathematical theory have

no intrinsic scheme for evaluation, they produce and, perhaps, require over-simplifications. It is hoped that the over-simplification presented in this paper will prove to match reality well enough to be useful to the social sciences.

"Mathematical" is used here in the sense of the references cited. See Bernstein⁷ and Piaget.⁸

An instrument is designed to demonstrate that human beings organize their social relationships with two mutually exclusive schemata using for one deterministic models and for the other stochastic models.

I. BACKGROUND CONCEPTS

This paper examines the possibility of integrating mathematical procedures into the design of an instrument. This is done by elaborating on a single empirical fact: motion picture films, which portray three geometric figures in action, elicit from informants stories about animated beings as they move in social space. Even when the size and shape of the geometric actors are changed, informants, in reply to the question, "What did you see?," continue to describe the movement of animated beings in social space. When actors varies from film to film, then each film is complementary within the class "movement of geometric figures in space."

Results of a distributional analysis of lexicon as it is distributed between the responses to two films are included. In one animated film, the geometric actors, three triangles alike in size and shape, "move" at various speeds

and in various directions. The action sequence and background features of the first film are exactly duplicated in a matched second film. However, in the second film, the three geometric actors (a large triangle, a small triangle, and a disk) are not alike. They differ among themselves. The complementary relationship, for the two films, is between alike actors and different actors in a social context.

The Major Hypothesis

The major hypothesis of the paper can now be stated. When alike/different is not used by a population to organize social cognitions, describable differences will not be found between sets of text elicited by the two films; but when a population uses alike/different to organize social cognitions, then the two sets of text elicited by the two films will contain mutually exclusive linguistic and dynamic features. The major purpose of this paper will be to present evidence, from the populations included in the report, that one film elicits data about appropriate social behavior between actors who are alike, while the other film elicits a complementary set of data about actors who are different. The results support the thesis that individuals develop principles about interpersonal relations and about behavior in society. These

principles serve an adaptive function because they help the individual to predict, anticipate, understand, and take an appropriate part in alternate networks of social inter-relationships.

Social Schemata

The social schemata which characterize the alternating networks (actors-alike/actors different) have a number of co-occurrent features. Stories about alike actors ignore or rebel against the culturally prescribed rules based on social positions of dominance. The action is between persons as social equals, and the relations between actors are symmetrical ones like "talking." In stories about actors who are different among themselves, behavior is based on prescribed rules with respect to social dominance. Each actor is restricted to those alternates usually available to the occupant of a single, culturally defined, social position. The relations between actors who are different among themselves are asymmetrical ones like "hit" and "lock up."

The range of opportunity to focus, by selective attention, on either differences or similarities is probably wide in any real situation. But in the schemata abstracted from the stories of informants, social difference or

similarity between the actors is superordinate. Actors different observe rules that are restricted to social position. But among like actors the behavior is between social equals, and the rules are nonrestrictive and exploratory. Thus the same real male person in the same situation can be seen either as an individuated person or else as the occupant of a social position. Both possibilities are not included in the same cognitive system by the informants. It is the presence or absence of one of these variables that is measured by the instrument.

Intense emotion is the most remarkable co-occurrent feature found exclusively in stories about actors different. Among actors alike, affective behavior tends to be quite low-keyed. Consider this typical integration of the "eternal triangle" theme taken from (text) responses to the actors-different:

An enraged and jealous husband guarded his wife, the circle, from her supposed lover.....
(various episodes).

On the same "eternal triangle" theme, this (text) response was given to actors alike:

The males are fighting over a female... (various episodes)
...three are a crowd, yet which of the three constitutes the crowd is always in question.

Most of the differences between the two varieties of schemata

are captured in those two brief quotations. Notice the distribution of kinship terms. Their distribution, exclusively to the schemata of different actors, provides the empirical base for a major theoretical conclusion of this paper.

In one population of thirty-five males not one term of kinship position appears in text elicited by the film with alike actors. But the kinship term "father" was used twenty-one times, and the kinship terms "daughter" eight times. Since all informants are asked for stories in response to both films, the method can be said to demonstrate that all informants, even the ones who use no kinship terms, recognize a cognitive boundary which makes the dynamics specific to different actors appropriate for the behavior of individuals in assigned kinship positions like "father". By inference, the informants in making these distributions have organized their social cognition with the same mathematical relationships that are specific to the instrument. Every individual in the group can be seen to switch from one coded channel of communication to the other. The instrument identifies the linguistic signaling systems specific to each channel as used by all members of the defining population.

It cannot be too strongly emphasized that the unit

of analysis in this paper is not the individual. The unit of analysis is the describable characteristics of the entire population of texts given in response to the instrument. Most population studies in genetics, in archeology, and in linguistics have used parametric statistics. This study is perhaps unique in its use of inclusive and exclusive categories in a population study. The instrument clearly identifies, for the whole population, two levels of cognitive organization.

At one level, restrictive patterns of social behavior are available to simplify a situation which is either too intense or too complex to be easily assimilated. At the other level, nonrestrictive patterns are used which make it possible for the membership of the group to focus on the total personality of the participating individuals. This seems to integrate well with an early suggestion of Sapir⁹ that duality of reference is an inevitable part of human experience and of the method of the social scientist. He did not see the interpretation of a particular sequence of behavior as either social or personal. When confronted with familiar people in relaxed circumstances, interest tends to focus on the individual. In relationships that are either too intense, too distant, or too routine, interest tends to

focus on cultural and social obligations. Sapir¹⁰ argued that each type of interest is necessary for the psychological preservation of the individual in an environment which experience makes increasingly complex and unassimilable in its own terms. The results reported here tell something about how this duality is organized into social structure.

Differential Lines of Transmission

In particular, the structural evidence found in the distribution of kinship terms tends to support the formulation of Parsons and Bales¹¹ regarding the complementary function of family and peer groups. It has long been known that elements of culture can be transmitted either through adults to children or from one generation of age peers to the next. Boys rarely learn to play marbles from their fathers. No culture can depend, for its future preservation and development, on the productions of perfect parents. Perfect parents have, in every culture, an erratic and low incidence. Other variables for the production of health in children must be regularly provided. The process seems to be cross-phyletic. In experiments with animals, at least two types of experience are seen as essential to behavioral adjustment. The experiments of Harlow¹² on the macaque monkeys are a case in point. The opportunity to play with

age-mates in early childhood is a developmental prerequisite to the achievement of copulatory ability in adolescence. Deprived of both mothers and playmates, they are incapable of adapting to the motions of sexual intercourse, even when paired with gentle and experienced mates, and many aspects of their behavior are grossly distorted. But given only mannequin substitutes for the mother, quite satisfactory adjustments are possible if age mates are available throughout the developmental period.

For man, the distribution of kinship terms, with all of their structural implications, into one variety of schemata for social relations, constitutes powerful evidence that two differential lines of transmission remain, for the mature adult, differentiated into two complementary and mutually exclusive ways of viewing the world. The schemata is in each instance shared by all members of a culturally bound group. There is no reason to suppose that individuals must assign one another permanently to categories that require a sustained use of either variety of schemata. Indeed, the dynamic oscillation between two linguistically coded systems of social cognition may be the social invention which enables man to deal with strangers in cooperative enterprises. Marler¹³ has reported that in field studies of

nonhuman primates the communication network within the group is extensive and varied, while communication with or about "outsiders" is rare. How does man deal comfortably with so many strangers?

Beaglehole¹⁴ has suggested that, regardless of the complexity or simplicity of a society, no individual is capable of sustaining genuine relationships with more than thirty people. As Ford¹⁵ has noted, "Compulsions to be formal and to avoid treating others with undue familiarity are widespread...formality continually emphasizes and reinforces the rules which define social relationship."

Some of the more traditional ethnographic reports have been little more than a description of the organization of these formal and highly verbalized formal (i.e., restrictive code) structures. When informants are asked how people behave they tend to tell how people "should" behave. They give the investigator what sociologists have called the normative standards of the culture. The hazard is well known to anthropologists, but no really satisfactory conceptual system for describing the "informal" (i.e., non-restrictive code) structures has been devised. A different model for the dynamic integration of nonrestrictive schemata into descriptive ethnology will be suggested here. The

distributions of the linguistic codes, as described below, provide powerful evidence in support of two assumptions. They are: (1) that culture is transmitted in two differential lines of transmission; and (2) that these two differential lines of transmission remain, for the mature adult, differentiated into two complementary and mutually exclusive cognitive systems which can be identified by linguistic coding systems. The codes make it possible to understand observed behavior as the results of a creative oscillation of patterns of schemata learned and used in the complementary structures of hierarchical groups and groups of social equals.

The support and feedback provided by the culturally defined egalitarian groups enable the individual to adjust the tensions between "reality" and "normative standards" as he has learned them. This difference between two ways of viewing social action can be seen as the source of the distinction between rules and compliance with rules; between statistically normative and culturally normative customs. A description of Pueblo culture based on how informants say it works, and a description of that same culture based on extensive observation of daily life, when compared, vary enough to make the two descriptions seem

incompatible.¹⁶ An oscillating integration of systems, only one of which contains the restrictive features of the normative standards, accounts for the dynamics of flexibility or social slippage which makes behavior in groups possible. At the same time, it accounts for the discrepancies between descriptions of a culture based on its normative standards and descriptions of the same culture based on observations of existing behavior which integrates but modifies the normative standards.

II. THE INSTRUMENT

Can Social situations be culturally defined so that at any moment in time the members of a culturally-bound group treat as real either shared social similarities to the exclusion of differences or...differences to the exclusion of similarities? If so will there be sets of rules specific to appropriate behavior when the members focus on social differences? And alternately, will there be sets of rules for appropriate behavior for the participating members when the focus is on similarities? To examine these questions a paired set of motion picture films has been constructed. The design of these films makes use of results established in the discipline of experimental psychology. It has long been known that motion picture films which portray geometric figures in action sequences can be used to elicit stories about social interaction.¹⁷ In a film used by Heider and Simmel, the "movements" of several geometric figures (two black triangles and a black disk), as projected from a motion picture film, "moved" in various directions and at various speeds. Groups of college students were shown the film and instructed simply to write down what happened in

the picture. In one group of thirty-four students only one described the animated action in "objective" terms, i.e., as inanimate geometric figures in motion. Michotte¹⁸ developed an entirely different instrument for producing a visual field of dots in motion. He found that subjects reported impressions of one object chasing another in patterns of withdrawal and patterns of approach.

This paper describes an instrument for eliciting two sets of linguistic text so that complementary elements of "meaning" in each set of text can be specified. The film used in the Heider-Simmel experiment was used to secure one set of the responses reported here. In this film the actors are different (two black triangles and one black disk). To secure a contrasting set of responses, a second film was constructed in which the movements of the actors in the first film were repeated but each of the three geometric actors was of exactly the same size and shape as the other geometric actors in the film (three black triangles).

Each film runs for just over two minutes. Each film is shown and responses taken before the next film is shown. As it happens, each film produces its own specific and characteristic type of response. No matter which film is shown first, the responses characteristic to the film with

actors-different have specific attributes, and the responses characteristic to the film with actors-alike have a different set of attributes. As we will see these distinctive characteristics are found in the response to each film when they are shown to fourteen-year-old Spanish-speaking males in a junior high school in Los Angeles County.

The variables in both films are extremely limited. The "meaning" of the stimulus configuration is only slightly changed between the two films. The films can be used to examine the question "What systematic differences in "meaning" occur in the linguistic text elicited by a film with actors-alike as opposed to a film with actors-different?" Since the responses reveal the manner in which the informant habitually structures and integrates his social perceptions, the discrimination between the two stimulus configurations reveals the organization used when the informant has focused on the alike elements between actors in a social situation as opposed to the organization of social perceptions when the informant chose to focus on the differences between actors in a social situation. The two organizational focuses can be seen as part of the instrumental¹⁹ inventory of the informant when systematic differences occur in the contrasting sets of text.

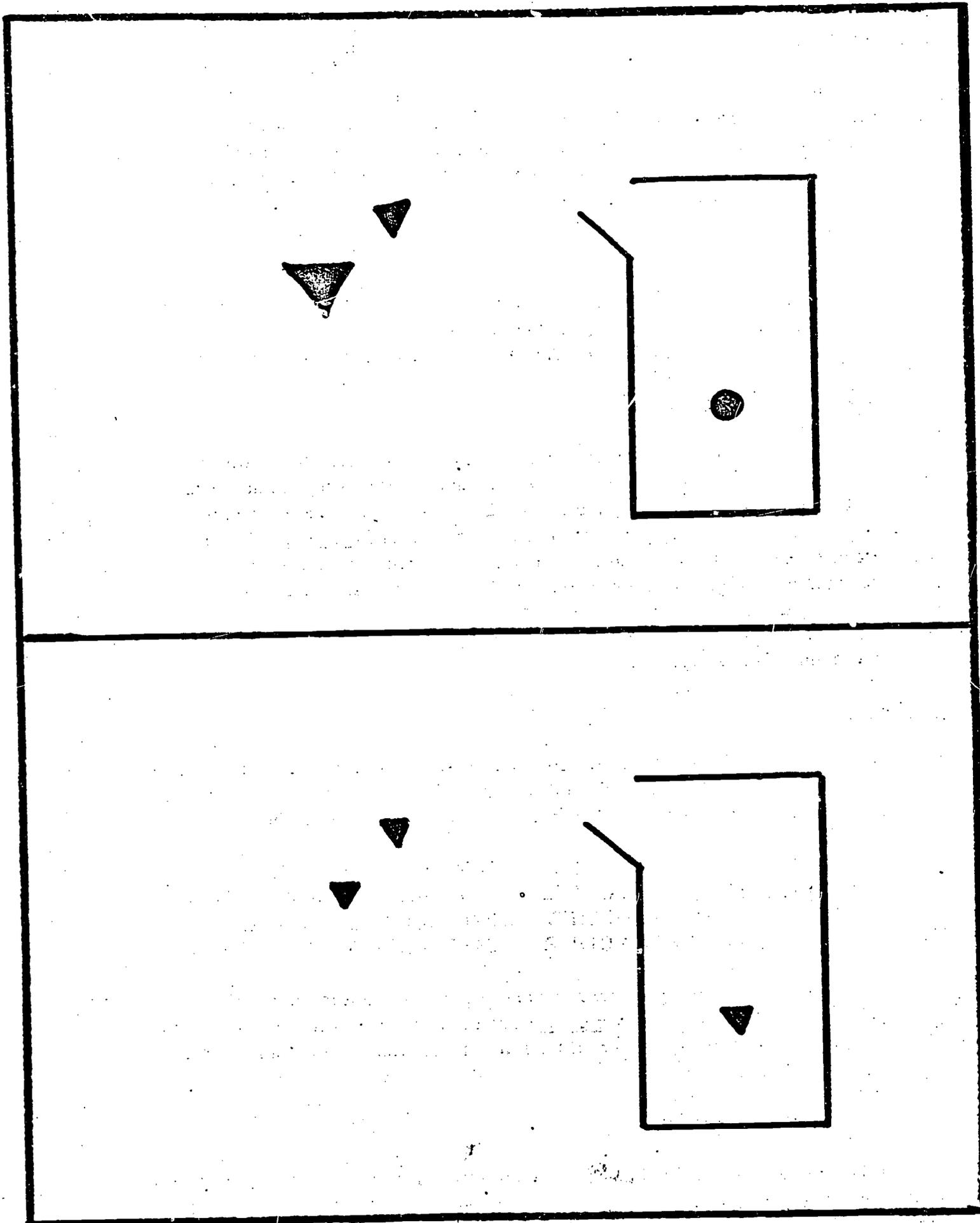
Antecedents Methods Used in the Analysis of Results

Antecedents to the methodology used to investigate the difference in "meaning" are to be found in the literature of anthropological linguistics. In essence, ethnoscience²⁰ has been used to refine and extend the discovery that motion pictures could be used to establish the dependence of a response on a stimulus configuration. The innovation presented here rests in the rigorous design it offers for the extension of the methods of ethnoscience into important areas of social dynamics.

At the risk of becoming tedious, the basic rationale will be summarized here. The research technique establishes the dependence of a "meaning" contrast (alike-different) on a matched set of stimulus configurations. For this purpose, a paired set of motion pictures has been constructed so that one animated film shows three geometric actors, alike in size and shape, as they follow a path of action that suggests conflict. This same action pathway is duplicated in a matched second film in which the geometric actors differ in shape or size. To verify the meaning that is tied to the stimulus configurations, contrast in the perception behavior of informants can be obtained by asking them to tell the difference between drawings of two matched frames from the two

films (See Figure A). Since the movements in each film enact exactly the same conflict situation between three geometric actors, the contrast in the perception can be compared to any unique elements of contrast isolated in the text of the collected responses. A frame of reference has been established in terms of which both the speech behavior and the non-linguistic behavior can be described or specified. Both the speech events (responses to the films) and the cognitive events (perception of differences in stimuli) are related to the stimulus configurations. The specification of the physical properties (alike-different) of the stimuli are related to the stimulus configurations. The specification of the physical properties (alike-different) of the stimuli served as a description of both types of events and is the basis of the contrast set where a contrast set is defined as "a class of mutually exclusive segregates which occur in the same culturally relevant environment (setting, context,, surroundings, situation, etc.)"²¹. The action sequence of the three geometric actors is the culturally relevant environment, and all sets of responses share this relevant environment as a defining feature. The design in the instrument can be elaborated. The important thing is that each elaboration in the visual field which

FIGURE A



produces regular changes in the linguistic responses of the informant can be identified as the cause of the regular changes observed.

Attempted here is only the minimal two sets in the same environment so that each has a unique feature of meaning. "Alike" is contrasted to "different." When this basic discrimination is extended by the informant to the range of the social relations, two varieties of social interaction are isolated which have co-occurrent dynamic features. As it happens, when "alike" is used as the basis for organizing social perceptions, nonrestrictive modes of social conduct are seen as appropriate. When "different" is used by the informant to organize social perceptions, restrictive modes of social conduct are seen as appropriate.

Administration

Administration is straightforward. For collection control, two colors of paper are distributed to the informants. One color is assigned to each film. The first film is shown, and the subjects are asked to "write down what you saw." Responses to the first film are collected and the next film is shown. Again subjects are asked to "write down what you saw."

Sample Size

In small sample populations, the words specific to each film are so dramatic that statistical statements about the distribution would serve little purpose. For this reason it is possible to eliminate the skewing of idiosyncratic responses by continuing the analytic work to units of from thirty to forty individuals. Let me show you what I mean. In one sample population used for purposes of illustration in this paper, father is used twenty-one times and daughter eight times in response to actors-different. Neither word occurs even once in response to actors-alike. This is a remarkable distribution of kinship terms to one set of responses. Thus the appearance of son in responses to both films need not mask the essential observation. This is particularly true when son has a high incidence in responses to the film actors-different and only one occurrence in responses to the film actors-alike. The justification for this type of sampling technique has been most adequately established in econometrics. It will not be fully examined in this paper.

Scoring the Results

A special KWIC program has been designed to produce a key-word-in-context index of a sample of text. In such

an index, all occurrences of a word, together with several words that preceded and followed each occurrence, are printed alphabetically in a format that permits easy inspection. A sample from such an index is produced here:

BOY AND THE OTHER GIRL
BOY GOT HIT AND WENT T
BREAK UP AND THE OTHER
CALL HER TO GO INSIDE

As this display shows, the computer print-out starts and ends without regard for complete words, but the index is created after the center break in each line. The words break, boy, and call are indexed above. A separate index is prepared from responses of the same population to the film in which the actors are different. They would appear in the computer print-out as a second index in the same format as the first.

Stop Words in Scoring

At this point the texts, elicited by the film with different actors, have been used to generate a concordance. A complementary film in which the actors are alike was used to elicit the text from which a second concordance is generated. Words that appeared in only one of the two concordances are category words of the mutually exclusive segregates "alike" and "different." The isolated lexicon that is specific only

to stories about actors who are different can be seen as a glossary specific to a social context in which the actors are seen as different. To reduce each concordance to an identifying glossary, it is necessary only to exclude from each index all words that appear in both of the contrasting concordances. This problem will now be discussed.

Concordance of Schemata

To prepare the concordances, a stop-word sub-routine was written into the KWIC program so that the, a, and, and an are not indexed. When a large sample of texts is indexed, any word that appears in both concordances is keypunched and inserted into the stop-word list. When the stop-words are identified, key punched, and entered into the stop-word list, the full text of the protocols are indexed in the computer for a second time. The print-out reduces the concordances to defining word indexes so that the words in the two indexes are specific to mutually exclusive categories. Since the lexicon specific to each film can be related by inclusion into a category "perceived organization of interpersonal relationships," it is argued that they are complementary, and each set of lexicon can be said to regulate the amount of information that is appropriate for the actors to communicate, thus providing an efficient program for the

identification, filing and retrieving of significant information.

Once isolated, the category words can be described as signals. As it happens, they signal significant social groupings so that individuals are able to deal with one another in a culturally-defined situation. A capacity for dynamic oscillation between the two contrasting sets of terms (and the two social groupings they signal) is verified by the instrument since the data for each set comes from the same population. They are not the product of a class dialect. They are available to college sophomores and to fourteen-year-old males from a minority group population. The same aggregate of individuals oscillates from one lexicon to another in giving responses. The unit of analysis is not the individual response, but the entire aggregate of text that is given in response to the instrument by a population. Most population studies use parametric statistics for analysis. In this study, inclusive and exclusive categories are the criteria of analysis; and, for this reason, the discriminations isolated can be called signaling systems.

Content Analysis

Content analysis, as used in the social sciences, is one technique of studying verbal behavior. In contrast to

GENERAL INQUIRER SYSTEM TYPE OF CATEGORY CONSTRUCTION

TABLE I

WORDS EXCLUSIVE TO RESTRICTIVE SITUATIONS

(Exclusive to film in which actors are different)

GENERIC LANGUAGE CONCEPT	TAG CATEGORIES	ENTRY PHRASES
Actors		
Perceiver Perceived Target	Hero Villain	little guy rapist
Behavioral Process	Role Obligation	protect wife guard wife little guy rapist
Qualities	Good Evil	bad guys better type
Control instrumented by	Force	trap capture pulls intimidate
Psychological	Positive Emotion Negative Emotion	level furious gets mad tantrum

GENERAL INQUIRER SYSTEM TYPE OF CATEGORY CONSTRUCTION

TABLE II

WORDS EXCLUSIVE TO NONRESTRICTIVE SITUATIONS

(Exclusive to film in which actors are alike)

GENERIC LANGUAGE CONCEPTS	TAG CATEGORIES	ENTRY PHRASES
Actors		
Perceiver Perceived Target		
Behavioral Process	Exploration Risk	romped around wanted to see what it was like
Control	Consensus	guided
Psychological Status	Anxiety	unable to decide couldn't stand the pressure
	Affiliation	live together work together join up

ethnographic reports or census enumerations, its primary data is some record of verbal symbols which makes up the context of communication. The techniques of content analysis are diverse and have been broadly defined as "any technique for making inferences by systematically and objectively identifying specified characteristics of messages."²² It aims to be exact and repeatable and to minimize the judgments of a single investigator. It employs an explicit plan for assembling the data and for classifying the data assembled. It attempts to measure concepts, to examine patterns and interrelationships and to interpret the findings.

The mutually exclusive glossaries specific to actors alike/actors different can be used as dictionaries in the computer compatible system of content analysis called the General Inquirer System developed by Stone.²³ All key-punching and scoring operations discussed to this point are compatible with the available subroutines in this system.

Research that is developed in statements which meet the requirements of this system have an available data bank of over six million words on IBM cards. Previous users of the General Inquirer System have prepared over fifty studies in which the investigator's theory and assumptions are

confined within the dictionaries of several thousand words. The incidence of the dictionary words in the raw data of a data bank is then used to make inferences. Data key-punched for these studies do not include the theory and assumptions of the completed studies.

The procedure suggested here for dictionary construction is an exact reversal of usual procedures. In the past, dictionaries have been constructed by developing word lists that seem to fit the categories of the investigator. For example, if the investigator wanted to construct a dictionary to isolate the restrictive elements in a transcription of social interaction, certain research categories might be selected. The investigator might select "hero" and "villain," "defined behavior," "good and evil." Having selected the categories, the investigator would then fully develop word lists which he intuitively assigned to the subcategories which he had intuitively developed to identify "restrictive" elements.

Suggested here is a complete reversal. The major categories "restrictive" and "nonrestrictive" are instrumentally elicited. It makes little difference to the construction of the dictionary if these categories are relabeled to read "more tightly structured" as opposed to

"less tightly structured" or "behavior transmitted by enculturating agents" as opposed to "behavior transmitted in the peer group." The word list is constructed empirically. The names of the categories are conveniences which identify attributes of the word list. These category labels most certainly do not determine which words will be selected for which category.

Content analysis has been productive to the extent that the categories have been clearly formulated and related to the problems investigated. For this reason, "the formulation and definition of appropriate categories take on a central importance"²⁴ in research designs which make use of content analysis as a technique for developing inferences from verbal data.

With the availability of the computer as an aid, the problem of standardization has taken on a new relevance. For computer use, categories must be clearly defined. Any investigator can inspect categories from a previous study to determine their relevance to his own problem focus. As a result, "packaged" content analysis categories derived from empirical data "could be used by different researchers in different studies to the end that studies would be more comparable and additive."²⁵

Comparison with Projective Techniques

Heider and Simmel contrasted the method used in this report with conventional projective methods: "...instead of presenting faces with the exclusion of the situation, we have presented situations and activities without a face."²⁶ This distinction will now be amplified to make explicit the departure of the instrument from the methods of psychological testing.

The film differs from the well-known Thematic Apperception Test.²⁷ The TAT provides the subjects with standard situations and faces. It elicits the Ss response to comparatively structured interpersonal environments. The extent to which the social situations presented are structured is revealed in the numerous modifications necessary to utilize this instrument for cross-cultural application.²⁸ The TAT samples the Ss capacity to identify these social situations. Using results of the test, the clinician has inferred interpersonal dynamics by identifying idiosyncratic deviations from normative responses. Thus, parametric statistics are at the core of the methodology with which responses from the TAT are made meaningful to the investigator. The research focus is on "modal personality" conceived of as an expression in parametric

distribution of the characteristics common to individuals in a group, and the unit of analysis in the methodology is the individual.

While the resulting evidence of regularities may be proper data for group analysis, investigators using this methodology for socio-cultural investigations have sometimes arrived at formulations strikingly similar to the commonplace dichotomy between individual and society. At a level that allows scientific analysis it is very difficult to do much with such a dichotomy. It lends itself quite naturally to an organic metaphor of society and has an extremely limited range of convenient use.

Heider's experiment departed radically from this methodology. His method of analysis was nonparametric. The variables presented in the film were extremely limited, and the elaborations of each story told by Ss were subsumed by a finite set of rules by which their variables could be extended to differentiate and organize social situations. Heider's objective was "not to determine the correctness of the response, but, instead, the dependence of the response on the stimulus configuration."²⁹ He argued that the organization of causality in the stimulus response was tied to the perception by the story teller of persons as the cause of

social action. The experiment became one of the classics of experimental psychology and has stimulated an enormous body of research into the way individuals perceive one another.³⁰

The research technique described here consists of a paired set of motion picture films. One film centers on similarities among the actors and the other centers on differences. Each film enacts the same conflict situation on the same background. For this reason, the recognition behavior can be compared to the speech behavior. The responses to the film with actors who are alike are said to contain stories about appropriate behavior between people who are alike. The responses to the film in which the geometric actors are different are said to contain stories about behavior based on social differences.

Frames of Reference

A frame of reference has been established in terms of which both the speech behavior and the non-linguistic behavior can be described or specified. The speech events (responses) and the cognitive events (perception of differences) were related to the stimulus configurations. The specification of the physical properties of the stimuli served as a description of both types of events and is the basis

of defining the meaning of the oscillating set alike/different
in its social context.

III. THE RESULTS

When the Actors are Different

In the responses to the film in which the actors are different there is confirmation of the parameters that were present in the often repeated experiment of Heider and Simmel.³¹ For example, the actors in the stories tend to accept prescribed roles which determine action on the basis of known and explicitly stated standards. The glossary reduced from the stories of nearly 900 American college sophomores reflect the pattern as do the more extended text of fourteen-year-old, Spanish-speaking high school students. A sample from the texts of the American college sophomores is given first to demonstrate the range of the instrument. These phrases indicate that the actors are assuming obligations assigned to a prescribed role:

Guarding his wife
Protecting his daughter

When actors are different, there are phrases which apply the good and evil construct to the organization of social possibilities:

Foiled because bad guys always lose
Went for the small triangle because he was the
better type

There are stories with the hero and the villain in which the hero clearly identifies with the standards of the community:

The rapist
The little guy comes to her rescue
Saved the day

The lexicon specific to the film with different actors reflects to a remarkable degree many of the features that Basil Bernstein³² has assigned to "public" language. The actors are described with linguistic forms which maximize the means of producing social rather than individual symbols. All in all, the actors are sensitive to an authority which is legitimized by the form of social relationship rather than by the more complex considerations of interaction between two persons as persons. These actors have, in a word, internalized the social system. This can best be illustrated by quoting, in context, some of the lexicon specific to actors who are different.

From the population of thirty-five, fourteen-year-old, Spanish-speaking males, the following phrases are selected for illustration in context of words that had a high frequency of appearance, specific to the film with different actors. Daughter appeared eight times.

Faked out appeared six times. Father appeared twenty-one times. Hit was used four times. And lock was used twelve times.

DAUGHTER (used 8 times):

The father tries to separate the daughter and the boy in a room.

One was the mother and the other two were her daughter and son.

The bigger one is the father and he's chasing the the young male away from his daughter.

FAKED OUT (used 6 times):

He faked the big guy out.

The round thing faked the bully out and then. . .

The dot fakes it out and then the two objects go and lock.

But the little boy was too fast for him and he faked him out.

The bully went in to go get the girl and she faked him out.

The boy faked the big guy out and locked him in the room.

FATHER (used 21 times):

The father catches a boy and girl kissing on the porch.

The father wouldn't let the girl and the boy get married.

The father locks up the daughter.

They lock the father in and get all happy.

The father is holding out his daughter.

HIT (used 4 times):

The big triangle started hitting himself.

He kept hitting the two others.

The mother was scolding them and started hitting the daughter.

The boy hits the bully.

LOCK (used 12 times):

They both ran out the door and locked it.
 The circle locked the big triangle in the rectangle.
 Then they locked him in the box.
 The boy manages to get inside and get the girl out
 and locks the father in.
 The father locks up the daughter.
 They lock the father in and get happy.
 The couple locked him in there.
 The guy came and helped the girl and locked the big
 guy in.
 The boy faked the big guy out and locked him in the
 house.

Hit and lock are typical of the verbs used to describe actors-different. They tend to be asymmetrical on the basis of positions of social dominance. The action is rarely, if ever, reciprocal. Other verbs exclusive to actors-different appearing only once in the sample are: distract, forced, give, holding, manages, outsmart, pretends, save, succeed, whip. Verbs appearing twice are corner and eloped.

In the film in which the geometric figures are different, the strategies are win or lose, the action is based on power plays between actors who, by the normative standards of a culturally-bound population, are either good or evil. The mathematical characteristics of the interpersonal equation make it simple to assign to the actors the

dynamics very like the theories of classical physics. The fields of force are lawfully determined. The interpersonal relationships tend to be asymmetric and well ordered. The social world is composed of points of social reference each of which has a definite position and a definite momentum. It is enough to measure present positions and momenta in order to calculate future positions. Social relationships are seen as either warm and inclusive or, alternately, as harshly rejective and exclusive. By staying within culturally prescribed and explicitly defined roles the actors are insulated from guilt. They seem to escape personal responsibility for what they do. Guilt is assigned to those who violate the appropriate rules for behavior in the social position to which they are assigned in the story. Aggression to maintain the social order seems to be permitted, and the momentum of the actor can be determined by the social position he occupies.

From a sample of thirty-five texts given by fourteen-year-old males whose family spoke Spanish in the home, the following words appeared only in response to the film with different actors:

Again	Guess	Relations
Against	Happy	Related
Almost	Happening	Represented
Big-Bigger-Biggest	Heading	Round
Both	Heart	Save
Brother-Brothers	Hits	Shark
Bully	Holding	Sister
Cage	If	Size
Cannot	Kids	So
Circle	Lady's	Still
Corner	Large-Larger- Largest	Succeed
Daughter	Laughing	Teaming
Different	Little	Than
Distract	Live	Think
Dolphins	Lock	Those
Dot	Manages	Toy
Down	Married	Triumph
Evil	Mother	Typical
Eloped	Next	Unite
Enough	Objects	War
Faked	Old	Ways (of doing)
Fast	Outsmart	Whip
Father	Picture	Who
Find	Person	World's
Flash	Pretends	Wrong
Forced	Proceeded	Young
Forgot	Quick	Yelling
Give	Reach	

The following list gives the number of appearances for each word that appears more than once in the text given in response to the film with different actors:

Big-Bigger- Biggest (34)	Dot (5)	Hits (4)
Both (2)	Evil (3)	Large-Larger- Largest (8)
Brother (2)	Floped (2)	Little (22)
Bully (18)	Faked (6)	Lock (12)
Circle (39)	Fast (2)	Married (2)

Corner (2)	Father (21)	Mother (7)
Daughter (8)	Heart (2)	Next (2)
Dolphins (2)		Represented (2)
		Round (4)

When the Actors are Alike

It is the remarkable contrast found in the stories about the actors who are alike that makes the method so relevant to anthropological problems. In these stories social needs and the opportunities of the situation tend to determine social action. The standards for action are determined by exploration and risk. Guarding and protecting, good and evil, and the hero and villain have no place in these stories. The following phrases from a sample of American college students are exclusive to the protocols to the film in which the actors are alike and are intended to illustrate, to some extent, the range of the instrument:

wanted to see what it was like;
 explores with reservation;
 begins to explore;
 explores this outside triangle;
 decided between;
 caused the two triangles to explore;
 carefully explored and romped around with;
 decides between 1 and 3;
 explores this triangle.

In the world of alike actors, the participants face many of the difficulties usual to quantum mechanics. It is not possible to measure present position and momentum with

equal precision. When we measure the electron's position, it is struck by a light quantum so that its original position is altered by an uncontrollable amount. The more precise the measurement of the electron's position, the less accurate the measurement of its momentum and vice versa. In much the same way, actors alike measure each other as total personalities; the more accurate the measure of the person, the less accurate is the ability to predict momentum. The very act of personal interaction between the total persons disturbs the measurements of the participants. The content of the texts given in response to the film with alike actors seems to have largely escaped explicit statement in ethnography. Cultures have been described in the more colorful and explicitly stated terms that organize the response to the film in which the figures are different. Indeed, the responses to the film of alike actors are most interesting for a remarkable absence of rules for social behavior that are rigid and explicit, their exclusion of status and role as orienting cues, their exclusion of conformity to symbols of solidarity which reflect a loyalty to cultural norms and aspirations.

In contrast to the text given above for the

different actors, the lexicon specific to the behavior of actors who are alike reflects a more individuated style of social interaction. Normative standards do not appear to be internalized. The villain is the cop and the society he represents. The actors deal with each other largely on the basis of the more complex considerations of individuated personalities. They talk together and decide and follow and find out how to do things. Some of the lexicon specific to actors alike is given in context below:

TALK (2):

Three nations talking about peace.
Then he goes out and talks to the other girl.

TOOK OFF (2):

So one of them got up and said he would be right back and took off with the other triangle.
Another boy came and the girl took off with him to the soda shop.

HOW (2):

A social crisis in which one is in the high class of society and how some persons are able to get their social adjustments.
One that is out shows the other how to get out.

DECIDES (3):

The boy decides to go pillow and then he changes his mind and stays.
One of the triangles was free so the other followed and then the other followed but the last one was like a mamma's boy or girl so it went in to get in trouble.

EACH OTHER (5):

I also liked when the triangles were trying to pick on each other.

The two that were in the room didn't like each other.

JAIL (2):

Then they put one in jail and then one breaks out.

It was a jail break. The first thing went off to escape.

Then he beat up the cop that was outside the prison.

A complementary lexicon specific to the texts of the same population in response to the film with alike actors is itemized below:

Adjustments (social)	How	Shop
Alone	Jail	Should
Another	Jealous	Sits
Appearance	Jumped	Social
Black	Lust	Society
Brighten	Loser	Soda Shop
Bumping	Makes	Sort of
Class	Mama's (boy)	Stays
Cop	Microorganism	Stopped
Crisis	Mind	Strongest
Cut out	Missiles	Surroundings
Dark	Money	Sun
Decides	Moving	Supposed to be
Dies	Must	Talks
Dislikes	Nations	Telling
Dog	New Generation	Third
End	Obey (not)	Till
Enemy	Own	Time
Escape	Pad	Tired
Family	Part (of it)	Took
Figures	Peace	Train

First	Prejudice	Trouble
Followed	Prison Gate	Yard
Funny	Put	You
Game	School	Walks off
Gate	Screen	Weakest
Home	Scrambling out	Well
	Second	Worth

The following list gives the number of appearances for each word that appears more than once in the text given in response to the film with alike actors:

Alone (2)	Home (2)	School (6)
Black (5)	How (2)	Social (2)
Cop (3)	Jail (2)	Stays (2)
Decides (3)	Jumped (2)	Talks (2)
End (2)	Makes (2)	Till (3)
First (4)	Moving (7)	Took (2)
Followed (3)	Prejudice (2)	Yard (2)
	Put (2)	Walks Off (2)
		Weakest

Full Text Responses from Thirty-five, Fourteen-year-old, Spanish-speaking Males to Both Films

The full text of all available responses in English by fourteen-year-old, Spanish-speaking males follows. D = response to film in which the actors are different. A = response to film in which the actors are alike. The texts are included to illustrate dramatically the profound differences between the two categories of social focus isolated by the instrument.

D = Protocol from film with different actors.

(D1) Like a person that wanted to punish these two other

ones. I guess that those other two had done something wrong because the way he kept on hitting the two others and the two little ones seemed like they were brother and sister because of the way they help each other.

(D2) A bully picks on a boy. Then goes into the room and gets the girl. She tries to get away. The boy hits the bully then they lock the door on the bully. The boy and girl have fun then the bully gets out and chases them.

(D3) This little boy was laughing at a big guy to distract him from beating up on a little boy. This big guy got mad and ran after the little guy. The little guy closed the door but forgot to lock it. The big bully opened the door and cornered the little boy. The other boy who had almost got beaten up came to help the little boy. He faked the big guy out and they both ran out the door and locked it. The big bully got mad and broke down the door and ran after the kids. They ran away and left the bully inside.

(D4) It looked like two men and a girl and the two men were fighting over the girl.

(D5) It seems that the biggest triangle was trying to get the circle which was a female. The smaller triangle was trying to save the circle. Finally the smaller triangle

and the circle went off and left the biggest triangle going around square which was to me as a home.

(D6) There was a big triangle, a little triangle, and a circle. The big triangle was chasing the circle. Then the circle went into the triangle and the big triangle chased him in the rectangle. Then the small triangle and the circle locked the big triangle in the rectangle but got out and chased them.

(FOR THE REMAINING RESPONSES TO DIFFERENT ACTORS IN THIS SAMPLE GC TO APPENDIX A)

A = protocol from film with alike actors.

(A1) There are two girls and a boy. The boy goes with one of the girls in the box. Then he goes out and talks to the other girl. He then starts getting friendly with the girl. Then the girl in the box sees them together and gets mad. The girl starts chasing the boy and then he goes into the box. Then the two girls leave and the boy decides to go follow but then he changes his mind and stays.

(A2) I saw some triangles going into a box and they kept breaking the box. And I also liked when the triangles were trying to pick on each other.

(A3) Two triangles fighting. Then they put one in jail

and then one breaks out.

(A4) Three nations talking about peace and then the arguing two start fighting the weakest sits and watches. One was beaten off and the strongest and the weakest walk off together.

(A5) I seen in the film a rectangle box with one end of the long end with an opening that would open and close. There was two triangles helping each other against the one third enemy.

(A6) A train, a dog, two people kissing and the sun and shows you funny figures.

(A7) It was like two people together and no part of it.

(FOR THE REMAINING RESPONSES TO ALIKE ACTORS IN THIS SAMPLE GO TO APPENDIX B)

Full Text of Responses by College Sophomores to the Film
in Which the Geometric Figures Are the Same

Actors different elicit much the same response with equal elaboration in the college sophomore and the fourteen-year-old Spanish-speaking group. They will therefore not be listed in this paper but are available from the author. Because responses to the alike film are more richly elaborated by college sophomores than by fourteen-year-olds, some of their responses are included to illustrate the

the elaborations possible in this code.

(A1) The representation of life forms can easily be accomplished by simply showing any inanimate object in motion. Purposeful direction with simulation of desire in this motion can heighten the symbolism of life forms. This film has used three triangles silhouetted in black to achieve simulation of an alive entity.

(A2) This is a story of two friends, both inside a box together, both similar in ideas, looks almost identical people. One realizes a solution to get out of this box not only for escape but also to meet a person that they can see outside. The person they see outside also looks like the two inside: so when one escapes, he goes over to meet him, only because he cannot believe that three can look the same and also have the same ideas. After meeting him, he realizes that this guy is dumb, stupid, and corrupt. Signaling his friend to come out of the box, he does and both leave. Proving how stupid the one outside was, he went into the box only to realize that he is trapped forever.

(A3) There were three figures in this film. It seemed as though the figures represented people. The two triangles

in the box were female, and the triangle outside was male. When the first female came out of the box, she met with the male and checked him out. Meanwhile the other female was emerging from the box. As the second female made herself aware, the male moved aside, and the first female came down to meet her. After checking her out it seemed that the story was coming to the close. The two females went finally off together establishing a lesbian image. The defeated male went back to the box defeated, as it was learned he was frigid. Too bad.

(A4) The square was the body of a spore-forming plant. The triangles were the spores parting from plant. As time came in the year for the reproduction cycle to begin, one of the spores left the plant and went about its random journey to unite with another spore. This happened much like the journey of the sperm cell in human reproduction, the second spore, or sperm, couldn't make the partnership; and returned to its origin. This doesn't necessarily have to be a correct technical explanation of the processes, briefly mentioned, but skips from one realm to the other. Basically, the film reminded me of some sort of sexual action involved in reproduction.

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(A5) It looked like a picture might be representing three animals, two males and one female.

(A6) It's about three individuals and their relation to society and each other. Two of them are bounded by society and the other is outside of it and completely free. At first this person tries to get in but finds society impermeable and remains content with his position. Of the two inside, one is quite active and seeks to get out but can't. The other is immobile and passive, apathetic, etc. When the door opens to the active one, he decides not to go after all because he is content. But the inactive one decides to leave to find out what lies outside. He then interacts with the individual outside, and they leave together.

(A7) I saw two people, or two something, being trapped inside the square and seeking escape. When one finally does escape, he is repelled and forced back. While they are battling, the third triangle seeks to escape. However, the first one that escaped is not as easy to be repulsed. He and the other triangle doing the chasing seem to join up and go on their way as companions rather than enemies.

(FOR THE REMAINING RESPONSES TO ALIKE ACTORS IN THIS SAMPLE

GO TO APPENDIX C)

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IV. DISCUSSION

On the basis of results obtained to date, a relatively simple system of interrelated hypotheses can be used to describe the relationship between language, culture, and personality. These hypotheses are grounded in a common theoretical position in respect to adequate statement of descriptive results that is shared by Goodenough³³ for culture, Chomsky³⁴ for language, and Newell, Shaw, and Simon³⁵ for psychology. In each case, powerful arguments are given for the statement of descriptive results in terms of the shared rules used by a population for the organization of reality.

In the most general terms, actors who are alike tend to elicit rules that are transmitted within the structure of a peer group. On the other hand, actors who are different tend to elicit rules that are transmitted by enculturating agents within hierarchically structured groups. The most important result of this study is the demonstrated oscillation of the sampled populations between two mutually exclusive sets of rules or schemata. The co-occurrent features specific to each variety of schemata are used to demonstrate that informants, at two stages of maturity, continue to contain within mutually exclusive cognitive systems any feature

transmitted in one or the other of the two systems of cognition.

Linguistic signaling systems are identified which make it possible for the participating membership of a group to shift between two ways of organizing social behavior. The individual finds validation of normative rules of behavior when a group is hierarchically structured. He finds validation for a modification of these rules when the group shifts to an egalitarian structure. But the egalitarian structure, based as it is on the interaction of individuated persons, cannot function without close and continuous contact among the participating membership. For typical and reoccurring situations and for situations that are intense enough to be disruptive, normative rules seem to be adaptive. But the rules are categorical, and situations often arise in which conformity to the normative rules can only dwarf individual and group goals. The results of this study tell something about how the individuals in a group can violate the normative standards without eroding trust or undermining motivation.

Since the individual is not the unit of analysis, the ability of all informants to oscillate from one to the

other focus suggests several more or less radical theoretical innovations which cumulate quite naturally into an assault on the old problem, "How can cultural change be explained without embracing a dichotomous conflict between the individual and society?"

Evidence has been presented that "restrictive" and "nonrestrictive" glossaries signal differential channels of communication, and that the social dynamic they signal is transmitted in two contrasting varieties of social situation. Culturally, the differentiated social dynamics are transmitted in different lines of transmission so that the adult-child line of transmission establishes the dynamics of one style and a peer-group line of transmission establishes the alternately available dynamics. When adults are the enculturating agents who transmit a set of values and attitudes appropriate to a particular role, that role will tend to change very little from generation to generation. But when a social group de-emphasizes adult transmission of a particular role, and when most of the content of a role is transmitted in the age-group peer lines, that role will be subject to an accelerated generational shift in definitions of appropriate behavior. Thus certain structural features

of a social group can be related directly to the speed and intensity of change both of the participating individuals and of the group itself.

The rate of change in role definition is not the only result of an emphasis on one or the other of these two differential lines of transmission. Items transmitted in the adult-child line tend to be treated by the participating individuals as "shoulds" from which no deviation is tolerable. These "shoulds" are the area of behavior that can be described within the available theoretical structures of the social scientist. A full description of the items of cultural organization which in this study are isolated by the film actors alike belongs to the future.

Much more than a difference between the rules of the game and the way the game is played is involved. There seems to be a continuum of cultures which can be described as ranging from the tightly organized to the loosely organized. Only the tightly organized features of these cultures have been adequately described. Successful and populous cultures such as that of the Kamba of Africa have seemed colorless and amorphous to the anthropologist. Yet these people have been highly adaptive and are firmly

committed to their way of life. It is exactly these neglected cultures which can provide natural laboratories for the investigation of human behavior in a social structure that is transmitted largely outside the authority line of the restrictive code.

Where differential lines of transmission can be established, a theory of change can take into consideration the ethnostructural conditions responsible for the context in which change takes place. Theories which omit ethnostructural considerations can hardly provide the behavioral scientist with many predictions beyond those directly observable in the laboratory. The impact of this consideration has already been felt among psychologists. Recent theories of changes have focused on intra-individual determinants such as the incongruities between choices professed by the individual and the choices he is forced to make;³⁶ or between what he wants and what he perceives as efficient behavior.³⁷ Sociologists have concentrated on an attempt to relate structural elements of society to culture.³⁸ The evidence developed in this paper suggests a method by which it may be possible to integrate an ethno-structural model of "formal" and "informal" roles into a dynamic model on the basis of

the following theoretical position:

Basic Assumptions:

1. That there is systematic variation in the realm of cultural phenomena.
2. That social systems, to function, must permit flexibility in the behavior spheres for a creative movement into novelty.
3. That some roles are defined in a complementary set which is called a construct.

Hypothesis:

1. That culture can function in constructs that organize differences-and-likenesses at a perceptual level.
2. That organizing either pole of a construct extended into life situations of the behavioral sphere becomes varyingly inappropriate in the organization of reality.

Since the "informal" structures isolated by the instrument are the central new evidence for the arguments, the more elaborate responses of male college sophomores were included in the chapter, "Results," for contrast

with the same "informal" responses of the four ten-year-olds. It is now possible to see that each information channel would be inadequate if it were required to carry the full burden of organizing reality. The "informal" channel requires that all elements be structured from information available in the immediate situation. In the more restrictive channel it is possible to exploit the imperfect designs that are culturally defined.

Methodological Considerations of Validity

The variation into complementary sets has been elicited by known variations in the nonverbal stimulus configuration. Since only the attributes of these complementary sets have been identified at an analytical level, this discovery technique satisfies the objections to antecedent methods. The contrast set in ethnoscience is formally defined as a class of mutually exclusive categories which occur in the same culturally relevant environment, but, as Bright³⁹ has argued, "Cultural relevance is exactly what the ethnographer is trying to identify." The definition begs

the question about how to proceed to identify the contrast set. To overcome these difficulties, the instrument described here incorporates several restraints. First, the number of variables used to elicit responses are severely limited, and the relative value of different stimuli in eliciting culturally relevant responses is determined by experimentation. This limitation in the number of variables employed in the construction of the instrument makes it possible to demonstrate that the elaborations contained in the stories are subsumed by a finite set of rules for organizing the variables seen in the films.

The two films moved us directly into the respondent's cognitive management of perceived social realities. Since the two oscillating sets are related by inclusion into a category "perceived organization of interpersonal relations," they are complementary and can be said to regulate the amount of information communicated, thus providing an efficient program for the identification, filing and retrieving of significant information.

What do we have? Has the instrument, to this point of analysis, bypassed the problem of cognitive saliency?⁴⁰ Certainly the investigator has not imposed the definition⁴¹ of the domain boundary⁴² with which the subject segregates

the use of signal words in a social context. Even analysis by inspection dramatizes the interesting possibility that highly verbalized typologies of social relationship, even when they can be properly assigned to persons in the reality situation, are treated as out of awareness when the focus of a social group is on "alike." This would seem to expand the possibilities for a systematic investigation of social interaction in which verbalized normative standards are treated by a group as irrelevant to the situation. It dramatically illustrates the interesting possibility that highly verbalized typologies of social relationship may linguistically signal the introduction of one of these two ways of structuring interpersonal relationships.

The isolation of hierarchical terms into one of the two sets of responses would seem to satisfy for anthropological purposes a second theoretical objection to antecedent methods of analysis. They have been excessively preoccupied with hierarchy and "there are many other kinds of . . . relationship which are equally important."⁴³

The complementary set isolated by the instrument does not place hierarchical terms in complementary relation to each other, as have antecedent methods. Rather,

hierarchical terms and co-occurrent relations are contained exclusively within the extensional definition of one set of responses. Isolated in complementary oscillation is a second set of responses in which many other kinds of equally important relationships are included but from which hierarchical terminology is largely excluded.

Even without instruction to do so, informants create systematic differences in the stories they tell in response to the two films, and they do this regardless of the order in which the films are shown or of the time interval between showings. They do not say that this is what they are doing, but the results show that the differentiation is too consistent and too regular to be a chance phenomenon. Thus the complementary set is elicited by known variables and the complementary relation between the two sets is instrumentally determined. The identification of the specific attributes that are co-occurrent in each set of responses is made by an analysis of the specifications made by the subjects in their responses. There is no need for the investigator to establish a contrastive relationship in the mind of the informant. Logical ordering does not have to be established by analysis since this function has been performed by the

instrument. The Aristotelian logic that is implied in a relation of "contrast" is avoided. What is called a contrast set in antecedent methods is called an oscillating set, and "contrastive" here is used in its literary and not in its logical sense.

Starting from the extensional definitions (the total element in collected responses to either film that is exclusive to that film), the next step in a distributional analysis would be to specify by intensional reduction those definitive attributes which segregate the responses.⁴⁴ "To segregate" the responses is assumed to mean "to separate (them) from the main body and collect in one place."

The first intensional reduction was achieved by introducing stop-words into the indexing program so that words which appeared in responses to both films could be excluded, so that each concordance thus becomes a film specific glossary. Within the oscillating set isolated subsets can be specified. Evidence has been presented in this paper that one subset with describable features specific to each film can be related by inclusion into a category: "appropriate standards of behavior determined by." In this subset, unique responses to the film in which the geometric actors are different are used to make explicit a rule for

appropriate behavior in a group when the focus is on social differences among the participants: actors should accept prescribed roles to meet expectations for appropriate social behavior and should guide their conduct by standards of good and evil after locating the heroes and villains in the situation. The standards are known and eternal.

In contrast, responses unique to the film with geometric actors who are alike indicate that standards are discovered by exploration and risk. The rule for appropriate behavior in a group when the focus is on social similarities would be: standards of conduct are discovered by individual experiments by trial and error in a social environment which produces experience. Behavior should be sensitive to the opportunities of the situation and the needs of the group members. Standards should be appropriate to the immediate situation. Thus a cautious experimentation with the parameters of the situation would seem to be the most valued form of social behavior when a group is organized in an equalitarian structure.

The essential "meaning" of the superordinate set, alike/different, is established by the instrument. The validity of the subsets must be established by sensitive field work. But the elicitation techniques needed for

validation are well developed and have been reviewed by Conklin.⁴⁵ The purpose of this discussion is to establish the validity of the major dimension meaning which is instrumentally defined.

Cross-cultural Considerations

In cross-cultural analysis, it is the attributes "alike" and "different" which must be compared. The total impression of the message has been formed according to Gestaltlike principles and must be analyzed by an appeal to Gestaltlike laws. One of the problems is to locate the organizational focal points of culture. In the formal viewpoint the particulars are subsumed within the general in a patterned, structured, and determined manner. The pattern of these relationships is expressed in formulae in which the relationship, rather than their quantitative value, is significant. The emphasis of the formal viewpoint is structural. Empirical observations determine whether formal models—and ultimately the theory on which they are based—should be rejected or retained. The concern in this paper was with the creation of a formal model which can account for the social slippage of cultural reality and which organizes the basic matrix of cultural organization to permit its

orderly integration into mathematical models both formal and probabilistic. The model could easily be universally distributed. Everywhere in life there are mechanisms of variation (producing a new variables) and mechanisms of continuity. But the instrument cannot be expected to identify the organizing mechanism of all cultures.

In a cross-cultural comparison, the question is not whether or not the two schemata are present in all societies. The question is not whether or not the two schemata are present in some societies. The question is whether or not the societies investigated use "alike" and "different" as a complementary construct for the superordinate organization of social relationships. Traditional methods of eliciting the rules of linguistic behavior simply cannot be applied to this problem.

In an attempt to capture the obvious advantages of clarity and rigor to be gained from an application of the axiomatic method, kinship studies have recently utilized the symbolism of mathematical logic. As it happens, among culturally-defined systems those of kinship and language are perhaps the most resistant to change. They consistently reveal a narrow span between the cultural norm and the

cultural reality. It is not surprising to find that in studies of kinship and language stable models seem to work better than for most cultural data. Suggested here is a model for the integration of the more dynamic features of culture. The defining mechanism is found in the more stable patterns of language. These have been isolated by using formal logic in the design of an instrument.

But there is absolutely no evidence that cultures have universally elected to elaborate their social organization by using alike/different as a basic discrimination. Seeing social difference in terms of the contradictory opposites of alike/different is one possibility; but the same opposites are seen in the more complementary relationship of male/female. The process mechanisms which determine whether or not a cultural invention is adaptive may be subject to the same operating rules as somatic traits. The ones that are distributed in Western civilization need not be the only adaptive combination.

New methods of analysis and new approaches to synthesis⁴⁶ have made systematics one of the focal points of anthropology. Fundamentally, the problem of systematics is that of detecting evolution at work. A great deal of

diversity produced by isolation is irrelevant to the main trends of evolution. The main trends depend upon the basic biological facts of reproduction, mutation, and selection. The base on which the universals of culture have been elaborated must be subject to these biological facts. The identification of a minimum base for adaptive behavior in culture should make it possible to isolate the vital from the stylistic elaborations. It would then be possible to ask how the discontinuity of cultural groups is introduced into this biological continuum and how continuous change is effected in a group even when some new discontinuity is not arising?

There are two dimensions along which comparative research varies, each of which contains a paradox and both of which are important to an understanding of the research reported in this paper. Anthropologists influenced by the cognitive movement have emphasized the importance of culture-specific; and a central theme of comparative anthropology continues to be the variation in the solution of problems (i.e., kinship) presented to different cultures. Yet to the degree that a solution is culture-specific, to that degree it becomes difficult to specify the characteristics

of a common process underlying the variation from cultural group to cultural group.

A parallel difficulty appears in the distinction between ethnographic descriptions and experimental/theoretical study with an artificial manipulation of stimuli and data. Field observation typically results in a more highly organized description of the culture so that stylistic elements cannot be segregated from the vital core that is biologically necessary and thus universal. The experimental/theoretical investigation of culture might permit a better estimation of the operation of selection but may remove the isolated variables so far from their context as to destroy the efficiency of the analysis.

Neither the conflicting demands of culture-specific analysis and the analysis of the underlying process, nor the conflicting demands of ethnographic and experimental study, are fixed obstacles in the development of comparative anthropology. However, these problems are indicative of the difficulties that lie in the way of setting up rule-functions relating the behavior of individuals to the behavior of social groups to the universal behavior of man. Only as such rule-functions or theories are elaborated with

consideration of common processes and specialized differences will anthropology become truly comparative.

At an intracultural level, generalization can be attempted with confidence only when the recorded observations between cultures refer to rigorously defined variables that require no contextual specification. A lack of clear alternatives dictates that we should stick to the problem. A critical recognition of the inherent weakness of taxonomic standardization developed for the use of trait analysts in the thirties does not solve the theoretical necessity that critical variables must be isolated before systematics can be productively carried to an intracultural level of generalization.

Conclusion

This paper has demonstrated that the human being can order social relationships with mathematical logic. For the populations studied, it has been demonstrated that the mathematical ordering establishes a complementary relationship between the social dynamics which encourage variation and the social dynamics which preserve continuity. Each set of social dynamics has a specified linguistic signaling system which permits groups to orient themselves to

one or the other of the two systems.

Suggestions for Further Research

The integration of the results from several disciplines is possible within the theoretical structure that is implicit in the data. The treatment here follows the more traditional boundaries of each of these disciplines.

In Anthropology:

1) At least in some cultures, the instrumental identification of the dynamics and the content specific to the nonrestrictive channel of communication should make possible the study of the dynamics of tolerable social slippage without the negative implications and methodological difficulties of the concept of deviance.

2) Since the instrument identifies one channel of communication in which social changes are more easily facilitated and the signal words specific to that channel, the study of micro units of change could produce results that can be generalized.

3) The identification of differentiated channels of communication makes it possible to attempt functional analysis within mathematically-defined limits. For example, if the male and female roles are defined in a myth, it is

possible to describe the integration of these ideals into the culture as a choice function as defined in set theory so that elements of the myth function into a class male/female, which in turn functions into one of the two channels of communication. This would seem to be more rigorous than a statement that "myth" functions (trigometrically) into "culture" as the word "function" is used by Malinowski.

4) Cross-cultural limits of the instrument need to be determined in order to test the basic hypothesis of this paper.

In Linguistics:

1) The level of analysis of the two styles of language isolated by the instrument has in this paper been attempted only at the most primitive level. The analysis of these two linguistic samples for presence or absence of depth structure could prove to be productive.

2) Since differentiations can be made both by male and by female informants, the analysis of the results from these two samples groups could reveal something of the styles of social communication that are specific to each sex.

3) The evidence that the instrument in this model has isolated elements of additive meaning needs to be examined in other contexts. If the phenomena are widespread the

implications for a theory of meaning must account for this phenomena.

4) Other methods can be devised for eliciting linguistic text so that population studies can be made without the introduction of nonparametric statistics.

In Sociology:

1) The results suggest an integrated definition of formal and informal role structures. The theoretical implications of this integration need to be exhausted.

2) The description of the results in terms of symbolic interaction is an interesting possibility.

3) The signal words isolated by the instrument could be used, in the analysis of transcripts of group interaction, to identify changes in group climate.

In Psychology:

1) The conflict between nondirected therapy and more traditional methods of psychotherapy can be to some degree resolved. The traditional methods have attempted to resolve guilt by an attack on the "shoulds" of the patient. The client-centered therapy has trained the patient in the use of the dynamics of the nonrestrictive relationships. The results of this paper suggest that the two methods of therapy

are complementary. Research should confirm that any changes attempted in therapeutic sessions must find validation in real life egalitarian relationships to be of lasting benefit to the patient.

2) The demonstration that the informants use mathematical concepts to order their social relationships needs to be studied in terms of developmental history. The instrument should identify the age at which this mathematical ordering becomes possible.

3) The introduction of color into the instrument should make it possible to question the theory that color responses are tied to emotional content. This is true because emotional responses are assigned by informants only to actors who are different.

4) The introduction of increasing numbers of actors into the film should make it possible to determine the point at which the interaction is explained in terms of group interaction.

5) In the reported results, only alike actors are permitted anxiety by the informants. This suggests a structural definition of anxiety. In nonrestrictive groups indecision is permitted. The individual is not expected to know what to do. But in the restrictive code the actor knows what he

should do. He can feel guilt, but not anxiety.

Research Development of the Instrument

The development of the instrument will continue to make single variations between animated films so that a "meaning contrast" in the stimulus configuration can be tied to a "meaning contrast" in the responses of the informants. To this end films have been prepared which contrast black and white with color, films which vary the relative positions of the colored objects, and films which add more figures to the scene so that the dynamics specific to four persons or five persons can be determined.

It should be mentioned that there is no claim that universals are being isolated by the original instrument. It is predicted, for theoretical reasons beyond the scope of this paper, that the Navajo and the Japanese will not organize their social perceptions on the category alike-different and that their responses to the two films (alike actors/different actors) will be random.

SUMMARY

In summary, results elicited by an instrument from two sample populations support the theoretical position that all social interaction between individuals starts with a deterministic (i.e., either/or) choice between deterministic models of social interaction and stochastic models of social interaction. The paper has accepted the assumption of all theoretical mathematics that deterministic models can integrate stochastic models and not vice versa. In effect, the investigation has assumed that individuals trained in formal mathematics refined a mental process which they shared with individuals who had little sophistication in academic mathematics. It is argued that the use of even one deterministic models has been established as a necessary pre-condition of social interaction demonstrates that any integrated theory of human behavior must be stated in a stochastic model. For this reason the rule stated in this paper is presented as RULE ONE of an integrated theory of human behavior. RULE ONE maintains that all social interaction starts with a deterministic choice between two sub-sets of models for social interaction. This rule is specific, and unless man processes social interaction with this rule, an analysis of input information in a reality situation will be deficient, resulting in inappropriate social responses.

The deterministic choice of RULE ONE is between deterministic models of interaction based on social differences (i.e., kinship positions) or stochastic models of interaction based on social similarities (i.e., peer group membership). The theory states that the same individuals in a group, as they move through time may oscillate between the two available models during the process of interaction. For example, members of a family do not always deal with each other as individuated persons. They sometimes oscillate to deterministic models of behavior and deal with each other on the basis of the rights and duties of kinship position. The theory states that the definitive elements of the two models are not randomly transferrable from one model to the other. The "either/or" oscillation functionally subsumes into two mutually exclusive sets of rules for interaction (deterministic/stochastic) a large number of sub-sets of rules for appropriate behavior. Since the deterministic models are available, human beings do not have to know each other well in order to effectively interact. Since the stochastic models are available, human beings who do know each other well can selectively choose to ignore or modify many of the rigorously defined rules of conduct contained in the deterministic models. But social interaction is impossible between individuals who cannot process RULE ONE.

The instrument elicits stories about actors-alike and about actors-different. The results are scored to isolate signal words and attributes that are assigned by

tested subjects exclusively to stories about actors-different or actors-alike. The results support the hypothesis that individuals do in fact define social perceptions into mutually exclusive categories on the basis of either social differences or social similarities. It can be inferred that informants (subjects) tested can organize their perceptions of appropriate social interaction on the basis of either of two contrasting schemata based on selective choices of elements (social likenesses/social differences) available in any real social situation. At any measured moment in time, tested informants (subjects) do not additively combine behaviors specifically appropriate when the social differences are the point of definition with behaviors appropriate when social similarities are the point of definition. For this reason, the instrumentally elicited data can be analyzed to define some of the rules of appropriate interaction assigned by tested informants to deterministic models (i.e., overt expression of strong emotion is permitted) as they contrast to rules of interaction with stochastic models (i.e., overt expression of anxiety is permitted).

In this paper, it is argued that the informants have performed mathematically deterministic operations to subsume into the set "rules for social interaction" two mutually exclusive sub-sets of rules (deterministic/stochastic). It is argued that the informants (subjects) tested have functionally subsumed into two mutually exclusive models for social interaction a large number of sub-sets of rules for appropriate social interaction. These results

offer one explanation of the variations found between ethnographic descriptions of ideal behavior and ethnographic descriptions of observed behavior. Descriptions of ideal behavior have been formal statements of the rules contained in the deterministic models. Descriptions of observed behavior have attempted to contain the often contradictory behaviors that must be present in groups of individuals who oscillate from deterministic to stochastic models. The results reported in this paper tend to support recent theoretical innovations which have proceeded on the assumption that man uses serial ordering to organize his social relationships. These formulations of human behavior in terms of pure mathematics can be found in psychology in the work of Piaget,¹ Miller⁵ and Newell,³⁵ in anthropology in the work of Hymes,³ Goodenough³ and Wallace,³ in linguistics in the work of Chomsky² and Bernstein.²

APPENDIX A

DIFFERENT ACTORS

- (D7) It was about the big bully. The round thing hid from the bully the triangle was being beat up by the bully. Then the bully went to beat up the round thing. The round thing faked the bully out then the triangle came and helped the round thing. They got out of the box and ran away from the bully. Then they locked him in the box.
- (D8) There was a small triangle and a big triangle and a small circle. All of them were not in the box. The big triangle started pushing the small triangle then the circle went in the box. Then the big triangle went after the circle and started pushing it the small triangle went to the opening of the box then the circle got out as fast as it could and then the small triangle and the circle closed the opening of the box and the big triangle started hitting himself all against the box.
- (D9) One person having an argument with two other persons and its like the way people live.
- (D10) It started out with two triangles. One was larger than the other and also a circle was included, and a square. The circle was going in the square and the larger triangle was sort of like hitting the little triangle, then with a quick flash the large triangle went after the circle and as quick as a flash went in the square, but the large square went in and was going after the circle, and its little triangle went in the square and was helping the circle. It was like as if the larger triangle was going after the circle and the little triangle.
- (D11) A boy, a girl, a father. The father catches a boy and girl kissing on the porch. The father dislikes the boy and chases him. The girl pretends to go into the house, but she keeps looking at the father. The father leaves the boy outside and goes to give the girl a heart-to-heart talk. The boy manages to get inside and get the girl out and lock the father in.
- (D12) The father wouldn't let the girl and the boy get married so they eloped.
- (D13) Three different size. Large playing father, second to the largest playing daughter and circle playing the boy-friend. The father tries to separate the daughter and the boy in a room. The father locks up the daughter and the father chases away the boy. The father opens the room starts yelling to the daughter. The daughter runs out the door and locks father in.
- (D14) I saw two brothers running away from their father and one was caught and the other was in the next room and then the father went after the one in the next room and the boy ran out and they lock the father in and got all happy and then the father got out and proceeded to go after them.
- (D15) That the big triangle was chasing the smaller circle and triangle. Like a bully picking on a smaller people.
- (D16) This one is like a shark after some dolphins and the dolphins outsmart by trapping him in a cage.
- (D17) It appeared the circle and the small triangle were mates. The large one was like this world's typical "bully."
- (D18) I saw three triangles one was the mother and the other two were her daughter and son. The mother was scolding them and started hitting the daughter and the son was hiding in the room looking. Then the mother started heading towards the room so he hid. Then the mother found him and started chasing him around the room. When this was happening the daughter snuck up and they closed the door on the mother and started laughing.
- (D19) There was a big triangle and a small triangle and a circle. The big triangle was beating up the other triangle. After he beat him up he went into the room to beat up the circle and the circle kept out of his reach and the little triangle went to the door. The circle and the little triangle started running and the big triangle locked in the room forced the door open and ran after the others.
- (D20) The two objects (small triangle and dot) are being chased by the other object (large triangle). Then the little dot leaves and the big triangle starts to beat up on the little triangle. Then the dot comes to help the small triangle and the big triangle starts chasing it. Then the little dot goes in the box and the big triangle goes and looks for the dot, and the dot fakes it out and then the two objects go and lock the big triangle in the box and run away.

DIFFERENT ACTORS

- (D21) That one group of people are out for was and two groups that are being chased unite and form together to trap the other and not letting him succeed in what he wanted to do.
- (D22) To me this film represents one evil attacking to meek persons and shows that evil cannot triumph.
- (D23) The two people are fighting because one is bigger than the other. The big person is trying to get the little circles people but the little ones end up teaming together to get the big people.
- (D24) I saw two triangles and a rectangle and a circle. It look to me that the triangles were having an argument and the circle wants to see, then the big triangle goes after the circle, and the circle come out and they lock the door then the triangle comes out and starts chasing the circle and the triangle.
- (D25) Three people having an argument and running away from each other.
- (D26) They are trying to elope. One young female, one young male are trying to run away so they could get married. The bigger one is the father and he's chasing the young male away from his daughter. It also resembles two brothers running away from their father after the father is trying to spank the little brothers.
- (D27) The circle resembles a boy and the small triangle resembles a girl and the big triangle is the father and the father is holding out his daughter because she likes the boy and the father doesn't think she's old enough to go around.
- (D28) Two triangles, one circle and a rectangle.
- (D29) The two triangles represented two men and the circle represented a woman. One of the triangles was related to the circle and he saw the other triangle having relations with the circle. So he gets mad then tries to hit the triangle that was not related to the circle. They got away.
- (D30) I saw one big triangle one little triangle and a small circle. The big triangle was getting the small one and was chasing the other around the house. He was hiding around the corner. This big one couldn't find him so he went to work on the circle. When he was getting the circle the little triangle came in so the little circle came out and they closed the door on the big bully.
- (D31) There was a bully in the picture and he was beating up the other youngster and his girl was watching at the door then the bully went in to go get the girl and she faked him out and the couple locked him in there.
- (D32) There was a boy that got into a fight then he hid and got away. The big guy went and chased the girl then the guy came and helped the girl and locked the big guy in then he got out and chased them around.
- (D33) It looked like a man was trying to get a lady's son, and whip him. But the little boy was too fast for him and he faked him out. So his mother was waiting for him outside and when the little boy got out of the house his mother got him and they ran away.
- (D34) A big guy beat up the boy and went after the girl and the boy faked the big guy out and locked him in the house. And outside the boy and girl started kissing and the guy started running after them again.
- (D35) He was kissing her and then she ran so he went to the other one and opened the door and closed it then he was chasing her.

APPENDIX B

- (A8) Two groups of people prejudice over another group, picking and pushing around them, making them hide away till they leave them alone. Waiting till the other groups are away, for they could do the things they want, not being interrupted because of prejudice or dislikes or surroundings or appearance.
- (A9) It looked somewhat like rats or microorganisms. It appeared that one was a female and the other two males. It appeared that the female was first with one male and then left him for another.
- (A10) I saw three triangles, two were in a room and one was waiting outside. The two that were in the room didn't like each other so one of them got up and said he would be right back and took off with the other triangle. The triangle that was waiting got tired of waiting and left. All to me this film represents a social crisis in which one is in the high class of society and how some persons are able to get their social adjustments.
- (A12) The bugs are trying to get out of the trap. One that is out shows the other two how to get out. The first one to go out makes friends with the one that is already out. The second one in the trap is undecided and finally decides to go with the others. They die and the new generation takes over, but this time there is only one bug.
- (A13) People playing some sort of crazy game.
- (A14) To me these were missiles coming out from their pad bumping into each other. They were also like people coming in and out of a world of their own.
- (A15) People as triangles and a house as a rectangle. There is going in and out of the house.
- (A16) First it starts as one triangle is moving then it is trying to get out of the box. Then the other triangle starts moving. After all the triangles start to move, one is already out of the box. After they start scrambling out then the two leave and one goes back in the box.
- (A17) One square and three triangles moving. The triangles moved back and out of the square.
- (A18) Three triangles moving in and out of a square. One triangle stays in the box and the two others leave. And it looked like two people kissing and one out and leave one alone.
- (A19) Triangle block resembling male and female and two triangles resembles two girls and one triangle resembles a boy. The boy likes one girl so the other girl went away.
- (A20) I saw three triangles and a square and one triangle not wanting to make friends and the other triangle picking friends then the others left and the triangle that didn't want to make friends got jealous and went after them.
- (A21) I saw three triangles and a square. Each triangle resembled a person. One male and two females. The male liked one female but the other female liked the one male and the male didn't like the two females and the one male and the female split.
- (A22) I saw a large square with three triangles and the triangles were moving around and the square was opening and closing.
- (A23) It seemed as if the triangles were two girls and a guy. The guy wanted to kiss the girl. She got mad. So he went with the other girl.
- (A24) Three triangles and a rectangle. One triangle is on the outside and two are inside. Two leave and one remains in the rectangle.
- (A25) I saw something which to me seemed like two men were fighting over the triangle which was in the square. She would often go out to try to break them up. The men finally decided that the girl was not worth fighting for and made friends and left.

ALIKE ACTORS

- (A26) One of the triangles was free so the other followed and then the other followed but the last one was like a mamma's boy or girl so it went in to get in trouble. They were outside when they weren't supposed to be.
- (A27) This boy came out to plan and a girl wanted to kiss him. He didn't want to kiss her so he kept running away. Finally he went in the house to hide. Another boy came and the girl went off with him to the soda shop. The boy thought, I should have gone.
- (A28) I saw three people at school two boys and one girl and a school yard. One boy was kissing the girl and the other boy came out and fought with him. The loser went back into the school yard and the couple went home.
- (A29) It looked like two persons arguing about something and then the one in the box came out to argue too and then the other two chased him back into the box and then they left so the one in the box left too.
- (A30) Well all I saw was three triangles that seem to act like family telling their son to stay at home but he did not obey them.
- (A31) I saw these boys in school and then one guy snuck out and one guy jumped for his money then the guys friend came from in the school and helped him then put the guy that jumped him in the school.
- (A32) I saw three triangles. Two were in the rectangle and one was outside. Then the two inside got out. Then one of them went back.
- (A33) It was a jail break. The first thing went off to escape. Then he beat up the cop that was outside the prison gate. The other one went out of the gate and got caught by the cop who had been beat up. The cop took him to another jail. The other guy went back to jail. He didn't want to get caught so he sneaked back into jail.
- (A34) I saw a square and three triangles and the triangles were moving.
- (A35) I saw three triangles. They were in a rectangle that opens at the door to let the triangles out. When the film got dark the triangles stopped moving and when it brightened they moved around. At the end the triangles made one triangle go in the house and they went out of the screen and left one there.

APPENDIX C

ALIKE ACTORS

A8) Two triangles in a box are trying to get out. There is a third triangle outside the box. One triangle finds out how to get out of the box and begins to have war with the triangle already out of the box. After awhile, the second triangle in the box gets out. The two triangles that were originally in the box leave the scene, and the third triangle outside the box then moves into the box.

A9) One triangle, as the leader, guided the other out of the box, then after they were out, he selected one that he wanted. After this, he tricked one of the triangles into going back into the box and then cut out with the other triangle remaining outside of the box. The triangle left in the box realized he could leave at the end but he didn't.

A10) Observation of the unknown caused two triangles to explore their external environment from the safety of their internal environment. With triangle one, the most aggressive of the two, it did not accept the external environment and proceeded back to safety in his finite world. Triangle two accepted the external environment and went off with triangle three, the external entity, leaving triangle one behind who wondered if what he did was in his best interest.

A11) Well, at first there were these two being wrapped up within their own little biological niche. Finally one broke away from this realm with the help of an individual outside of their realm. Then finally the first one went out of the box, then soon after the other one began to explore but found that it would rather stay in its sheltered ways than to try and break loose from them. So the last one stayed on the edge of things as a compromise between the two. Not realizing that if you don't go one way or the other you'll be a frustrated individual, in fact you won't be an individual.

A12) It seemed like two studs in a corral turned loose on a filly. Each made his pass, and finally she chose one and took off with him, leaving the other in the corral.

A13) The film was about three people who were at first confined and then set free one at a time. There were 2 men and one chick. It ended up that the guy that got out first lost out to the other guy.

A14) Two triangles seemed to have liked each other, but the third one didn't like the other two, he liked it better in the safety of the box. The two outside the box were mature enough to get together and face up to life on the outside in the world. With the bond formed between these two outside, they were able to face the infinity of the world.

A15) The story of a family, 3 children were represented by the 3 triangles. One by one the children broke away from the family, but not without some kind of struggle. The last child had a very hard time with his initial break-away, while the others after getting away were very happy and well adjusted. The third just couldn't break away completely and after a short time on his own couldn't stand the pressure and ran back to the security of the family.

A16) Striving for the security of the home, A first tried to overcome the aggressiveness of B while C lay silent. Once B was chased off, C saw its chance for becoming the overlooker of the estate. C was also defeated and in the end A was unhappy with his overseer position and returned to the box.

A17) In the beginning, one object was on the outside, object A. Inside a confined area there were two other objects, B and C. Object B emerges from the confined area and has sort of a close scene or one like that of mating. Later object C emerged from the confined area. Object B and C left the screen and object A entered the confined area.

A18) Two beings inside the square wanted to see what it would be like on the outside and the one on the outside wanted to see what it would be like inside. They all decided that new surroundings were better and switched places. The single being couldn't decide if it wanted in or out; and as the film ended, it was still undecided.

A19) Two triangles were in the box and one was outside the box. The one outside wanted both of the ones inside to come out. They both came out, but after much jumping around, only one went with the other triangle. The other one went back in the box.

A20) The two triangles worked together to let the 3rd triangle into the box, after their job was done, #1 and #2 disappeared.

ALIKE ACTORS

- A21) The two triangles that were at first trapped in the box get away and forced the free triangle into the box. The two triangles then leave together.
- A22) Three people living together inside. One leaves and the second one goes out to bring number 1 back. Number 2 thinking to decide between 1 and 3 and this breaks up the trio. Number 2 kisses 3 goodby and goes off with number 1 leaving number 2 to live by itself.
- A23) Three triangles and a rectangle: one triangle outside, two triangles inside. One triangle from inside exists the rectangle and explores and encounters the outside triangle. The triangle from inside wavers at exit of the rectangle. Leaves. Two outside triangles force 3rd triangle back inside of rectangle. Two triangles leave site. Third triangle still wavers at rectangle exit.
- A24) There were three bodies, two inside and one attempting union. Finally one of the inner bodies broke free from its "prison" and met the outer body, carefully explored it and romped around with it. The 2nd inner body escaped to cause the other two some concern. It was forced back, the two left the scene together and then the lone inner body again emerged.
- A25) The door creaked shut, pushed by someone outside. The couple inside shivered with fear of the unexpected. Listening carefully, it became evident that whoever, or whatever, shut the door had moved away. In a he-man approach, the male ventured outside to discover what was prowling about the exterior. Outside he met an unknown force within himself--his conscience. Did he meet the new challenge? He backed away, turning his back on his mistress, unable to cope with himself; left alone to be a nothing.
- A26) The two triangles in the box seem to be trying to escape into the outside world of the third one. One does escape but shuts the door before the other can get out. He immediately begins to explore with some reservations. The last triangle gets out but comes back to stand in the door unable to decide on risking the outside world or keeping the safety inside the box.
- A27) A rectangle containing 2 triangles with a third triangle on the outside of the rectangle. The lower right hand corner opens up and one triangle leaves. The corner then closes leaving two triangles on the outside and one inside. The corner again opens. This time the other triangle leaves the rectangle leaving the rectangle empty. While the corner is still open, the triangle that was originally on the outside goes to the inside of the rectangle. The corner of the rectangle closes and the triangle moves to the upper left-hand corner of the rectangle. The two triangles on the outside come together and leave the picture at the lower right-hand corner.
- A28) A rectangle holding two triangles with one triangle outside. The escape of one triangle from the rectangle and interaction between the triangle outside. The triangle outside first then enters the rectangle. A third triangle escapes the rectangle leaving the two triangles once within the rectangle outside and the one outside at first, inside. A reversal of the outset of the flick. The two once contained inside leave with the one triangle remaining inside the triangle.

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