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Tailor-made Experiments and Evaluating the Intellectual Consequences of Apprenticeship Training

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In order to investigate the transfer of learning skills from an instructional context to a context in which the learning must be applied, an analysis is needed of crucial social and informational features of relevant daily tasks. For example, in studying transfer of learning among traditional tribal tailors in Liberia, West Africa, I have found that it helps a great deal to know how familiar to those tailors are the problems I use to assess learning. Familiarity is not a single, easily observed attribute of objects or events: to arrive at a reasonably accurate description of daily tasks and to rank the familiarity of a set of experimental tasks with respect to them requires extensive observation in tailor shops and discussion with informants, at the very least.

Much of peoples' understanding of what is being asked of them in a given situation comes from contextual cues—the setting, the role characteristics of others in that setting, interactional cues about the texture and quality of requests/responses, etc. Formal experiments are extraordinary in this regard. It might be said that a good experiment is designed in such a way as to minimize contextual cues. So long as "white room with chair, table, and psychologist" is itself a familiar context, which it undoubtedly is to many college sophomores, subjects and experimenters will understand each other reasonably well. But where neither the situation itself nor the expectations implicit in it are mutually understood, experimental situations are probably in general harder to "crack" for their social implications than are other forms of interaction, because of their contextual impoverishment.

Recent attention has focused on various strategies for coping with the drawbacks of experiments as interactive vehicles for exploring human thought processes. For example, see Labov, 1970, on observing people in natural situations, or the work of Scribner (1976) and Cole and Scribner (1974) on situating experiments through manipulating conditions, interviewing subjects about the experiment, and so on. There is, of course, a long-standing sensitivity in anthropology to differences in cultural categories and content differences across cultures.

Yet another tool for improving the validity of experimental techniques is proposed here: I want to suggest that it is useful to predicate the design and interpretation of particular experiments on knowledge of the culturally typical situations in which particular cognitive operations are performed on particular content within culturally appropriate formats. It seems to me that the content, the "subject matter," on which a subject is asked to perform mental operations, and those operations themselves, can be adjusted rather easily to take account of cultural differences. More subtle, and probably more important, difficulties arise from differences in formats via which a problem is encountered in everyday life, and whether the operation in question is customarily applied to the content.

The first step in applying these ideas to experiments seeking to assess transfer of learning in different educational environments is to identify the major learning situations that appear to have pervasive influence on cognitive skills. For the tailors in Liberia, two such situations—apprenticeship training and Western-style schooling—have selective impact on children over and above general socialization processes. The next step is to collect information which will make it possible to rank possible tasks with respect to their familiarity, through daily experience, in each learning situation. Among the tailors with whom I worked, experimental tasks had to be placed along two different continua of familiarity to the problem-solvers, because both school and apprenticeship training are important organizers of daily activities. And, of course, the familiarity ranking in one context might not have been applicable in the other.

Almost every task given to the tailors involved a graded series of problems. These were designed to range from very familiar to very atypical, even absurd, problems with respect to content. But the correct answers were common to both the familiar and the absurd variants of the task.

A description of one such set of tasks may make the procedures clearer. This set, involving quantitative reasoning skills, included estimating linear distances, extrapolating a simple function, performing arithmetic operations, and matching two-dimen-

sional figures for similarity of proportions.

For the first of these tasks, the tailors were asked to estimate the size, in inches, of the waistbands of two pairs of trousers; estimate the size of loops of string, then lengths of string, then pieces of wood. This series of problems is ordered in familiarity of content with respect to tailoring practice; it involves the same operations in all cases. The format for presenting the problems was suggested to me by the tailors themselves, as I watched them challenge each other to trouser-waist estimation contests.

The second task included 18 problems in which the tailors were asked to assign values to hip and fly measurements for trousers, given only a knowledge of waist measurements. Some familiar and some quite unusual waist sizes were used. Once again, the format, much of the content, and the operations were borrowed directly from the tailors themselves. Only the unusual content of very large and very small waist sizes fell intentionally outside customary usage.

The third task was arithmetical, and included number recognition and naming; understanding ordered relations between numbers; and adding, subtracting, multiplying, and dividing. Apprentices learn these skills when they are taught to use a measuring tape, and apply them in cutting out and sewing clothes. The familiar problems in this set followed the format by which these concepts were taught to the apprentices and the format in which they were applied. But neither context was so highly focused and readily identifiable as were the two previous guessing-games.

The fourth task required tailors to choose one of three figures that was most similar in proportions to a fourth, reference figure. Some of the two-dimensional pictures were of trousers, others of geometric figures. Whereas matching proportions probably occurs in tailoring because garments are of different sizes, the experimental task that used drawings on cards and presented four figures simultaneously was different from the three-dimensional, serial presentation familiar to tailors.

The next step was to rank-order the tasks (Table I). Our hypothesis is that the more unfamiliar the problems, the less we should find learning-transfer effects from tailoring experience. The Table presents the rank-ordering of the same tasks from two points of view—school-taught skills and tailor-apprenticeship learning. The same general hypothesis applies to both the tailoring and the school-ordered tasks; however, the tasks are differently ordered.

A set of predictions relating learning context to performance follows from the two kinds of rank-ordering. We expect tailoring experience to have a

TABLE I

	Familiar Tasks → *Unfamiliar Tasks*			
TAILORING	waistband estimates	string loop estimates	string length estimates	wood length estimates
	extrapolating waistband measures to hip/fly measurements (familiar waist sizes)			extrapolating unfamiliar waist sizes
	tailors' arithmetic problems			nontailors' arithmetic problems
				matching two-dimensional proportions, trousers, geometric figures
	Familiar Tasks → *Unfamiliar Tasks*			
SCHOOL EXPERIENCE	nontailors' arithmetic problems	tailors' arithmetic problems		estimating lengths of waistband, string loops, and wood
				extrapolating waistband measurements to hip and fly
				matching two-dimensional proportions, trousers, geometric figures

major effect on waistband estimates and a gradually decreasing influence on ability to estimate the other items accurately. Formal schooling should have no effect on such estimations, because tailoring is not taught in Monrovian schools. On the extrapolation task, tailoring experience should have a strong effect on familiar sizes and a decreasing effect as sizes become less and less familiar. Again, we would not expect schooling to have an effect. On the arithmetic problems, both tailoring experience and schooling should make a big difference, although the major impact of schooling should be on those problems that have no counterpart in tailoring practice. The content and the format in which the "nontailor" arithmetic problems were presented were similar to school-book problems, and should lead to considerable transfer, even though the content is buttons and spools of thread. The two-dimensional figures task is unfamiliar from both apprenticeship and school points of view. The task was only tenuously related to tailoring, and geometric ratios and proportions are not taught in their school. Thus, neither school nor tailoring experience should account for variance in the task.

The analysis of the data is still in progress. However, my preliminary results, based on regression analysis, in which tailoring experience is used to predict test performance, support the predictions made above. The amount of variance predicted by apprenticeship and school experience fall in the ways predicted from the two task orderings in the Table. My purpose here is to illustrate an approach to the study of transfer in particular and experimental design in general that draws heavily on a detailed knowledge of the circumstances in which skills are acquired and used outside the experimental situation. A familiar context borrowed for experimental purposes is probably worth a thousand words of literal-minded explanation in conveying the experimenter's intentions.

It was relatively easy to utilize native formats and familiar content/operation combinations in the transfer experiments I have sketched here, because the cognitive operations in question were not narrowly specified ahead of time, but only at a meta-operational level of transfer. People in all cultures "experiment" with each other every day—play at discovering someone else's skills and mental processes. Bending within-culture, customary experiments for psychological investigation seems a worthwhile use of anthropological field techniques. The next step, of course, is to work with native thinkers on ratings and rankings on scales of familiarity to consult with them in developing variations on native experimental designs.

[ED. NOTE: A long-standing problem in educational psychology, currently recognized as a central problem in cross-cultural psychology, is to determine the extent to which knowledge gained in one setting can be applied to other settings. In educational psychology, this centers around the concept of transfer of training: do certain training techniques result in more, or broader, transfer than others?

In cross-cultural psychology, two aspects of this issue arise. First, there has been a good deal of interest in how education affects cognitive development. This has been addressed by comparing schooled and nonschooled populations with respect to their performance on selected cognitive tasks. In the present context, this method can be viewed as a means of assessing the transfer of school-based learning versus community-based learning. However, such a procedure assumes that performance on the tests reflects general transfer of cognitive operations, not transfer that is specific to knowledge applicable only within the school context. This assumption is strong and, quite possibly, unwarranted.

The second aspect of the transfer problem in cross-cultural psychology is closely linked to the first. We need methods for determining transfer both inside and outside the specific domain in which the "transferable" experiences occurred. If we could solve this problem, we would simultaneously learn more about the generality or specificity of our tasks. Looking at the problem of transfer from this broader perspective, it becomes possible to ask questions about both the transfer of school-based learning and learning produced by a variety of educational contexts. Professor Lave, a social anthropologist by training, continues a tradition that dates back at least to Gregory Bateson in her discussion of the transfer of apprenticeship-based, as well as school-based skills among Liberian tailors. For further details concerning this work-in-progress, the interested reader should write directly to the author.]

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The Development of the Conception of Social Class

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Although a number of investigations have been concerned with the effects of social class on performance, little is known of the child's view of the stratification system. Theories of the function of stratification often make implicit assumptions that persons share a

consensus as to the criteria of class membership and the causes of mobility. The study of conceptions of social class is also concerned with the development of conceptions of social justice—an area of moral or ethical development largely ignored by psychologists. The present study dealt with the development of conceptions of economic inequality in children between five and seventeen years of age. Two hundred and thirty white, middle-class children and adolescents were either interviewed individually or responded to open-ended questionnaires. They were asked to describe rich and poor people, to indicate their similarities and differences, to explain why some people were rich and others were poor, whether and why inequality should exist, how inequality should be changed, and how they and a poor person could become rich. An extended description of this study can be found in Leahy (Notes 1 and 2). Only the data for selected questions are reported here.

Descriptions

A content-analysis system was developed in order to categorize responses to all questions. Descriptions of rich and poor were categorized along seventeen dimensions derived from sociological analyses of class (e.g., Bottomore, 1966) or dimensions of person perception (Livesley and Bromley, 1973). Motivation (or effort), law violations, life chances (opportunities made available or denied by class), educational status, and occupation were more frequently used in describing poor people. Use of money (spending or saving habits) and attitude toward persons from different classes ("class consciousness") were more frequently used in describing rich people. Poor people were described by their perceived deficits, whereas the rich were seen as looking nice, having more possessions, wise with money, and snobbish. These data suggest that children attribute more negative characteristics to the poor (especially lack of motivation) and view the rich as people who are nonegalitarian (i.e., snobbish). It is interesting to note that occupation and education (often used as indices of class membership) were used by fewer than 10 percent of all subjects in describing rich and poor.

Reference to class consciousness of rich and poor people increased with age, with none of the five-year-old subjects using that category. This may reflect developmental changes in role-taking (Selman, 1971), which leads to an awareness of snobbishness in the rich. However, these middle-class subjects appear to be relatively unaware of the feelings or attitudes of the poor toward the rich or toward the class system, perhaps suggesting that the emphasis on egalitarian attitudes in interaction style (i.e., not being snobbish) is a pervasive norm in American society, whereas recognition of consciousness of class conflict in the poor is either beyond the realm of their experience with the poor or in conflict with their own class position and interests. References to possessions and appearances decreased during adolescence, reflecting decreasing emphasis with increasing age on peripheral or external aspects in person descriptions (Livesley and Bromley, 1973). However, reference to appearances increased between five and ten years of age, suggesting that during middle childhood there is a growing awareness that clothes or appearance symbolize status. References to motivation or effort increased substantially during adolescence. This emphasis on the motivation of persons parallels the findings on the kinds of explanations and justifications of inequality used by adolescents in this sample.

Explanations

The five-year-old children did not understand the question of why there are rich and poor people, so only the data on subjects between ten and seventeen are discussed here. The most frequently used explanations for inequality were work, effort, and others as a source of money (usually inheritance). Race was used by only 4 percent of the subjects. Most explanations could be construed as comprising three general forms: luck or inheritance, equity-individualism (effort and ability), and societal structure (demographic, ownership, or class structure). Luck-inheritance did not change with age, but both equity-individualism and societal-structure explanations increased in frequency during adolescence. The most frequent explanation at seventeen or eighteen was equity-individualism.

These findings suggest that white, middle-class adolescents perceive the class system as open to social mobility (effort is the most common attribution during late adolescence), and that equity (input-output) establishes a basis for the justification for inequality. This emphasis on an equity theory of stratification may reflect the need to view the world as a just place, in which consequences (rewards and punishments) reflect the characteristics of victims and winners (Lerner and Mathews, 1967; Sampson, 1975). The parallel development of societal explanations reflects developing abstractness of political concepts (Hess and Torney, 1968) and the imminent questions of legitimacy that are raised by these attributions.

Justifications

Responses to the question of whether inequality of income should exist took several forms, including justifications which are behavior-contingent (incentive value of stratification), challenges to inequality in terms of the consequences to the poor ("The poor should not suffer"), and sociocentric challenges ("Poverty creates social problems"). A fourth category (which could be interpreted as a justification)

was the fatalistic response ("That's the way the world is—it can't be changed"). The most common response to the income-inequality question was the behavior-contingent justification, with a substantial increase in this response during adolescence. Challenges to inequality in terms of the negative consequences to the poor *decreased* with age, with the five-year-old subjects viewing inequality as unjust because people suffer. Fatalistic responses increased with age (especially at the age of seventeen), which would appear to conflict with the tendency of formal operational adolescents to hypothesize alternative possible realities (Inhelder and Piaget, 1955). Sociocentric challenges to inequality were used by almost none of the subjects.

These data reflect a tendency of white, middle-class children to become less concerned with the poor with increasing age and to come to believe in the legitimacy of extremes of wealth in our society. The general trend of our data (for explanations and justifications of inequality) suggests that these children and adolescents develop a just world ideology to find social justice in the stratification system. Although with increasing age they become more aware of the differences between rich and poor in life chances, these differences are not seen as important in challenging the stratification system. A major goal of any social system is to establish a sense of legitimacy for its authority and distribution of resources and power (Easton and Dennis, 1969), and for this sample the task appears to have been accomplished.

Our approach in this study was concerned primarily with developmental trends, although we are aware of the crucial dialectic between cognitive development and the political socialization of different segments of society. Our epistemology of stratification conceptions is that persons occupying different positions in the system will develop different conceptions of cause and justification—that with increasing development we would expect less consensus of legitimacy for different classes and ethnic groups and greater divergence in challenges and justifications of inequality. This year, our work will concentrate on racial and class differences in the conception of inequality in American society.

[ED. NOTE: The problem of specifying psychologically meaningful characteristics of groups of people defined in such terms as "social class" and "ethnic origin" is one of the most vexing issues facing comparative psychologists concerned with human development. There has been a distressing tendency in the literature to assume that each of these terms has equivalent meaning for groups defined in terms of one of them (for example, Blacks and Whites are "equated" with respect to socioeconomic status). This research by Professor Leahy, who used an interview technique, initiates the study of how children come to acquire beliefs about the nature and causes of the social order around them. The editors invite interested readers to send in their thoughts on alternative ways of sharpening the issues embedded in this complex problem.]

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When is a Context? Some Issues and Methods in the Analysis of Social Competence

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In order to know whatever they need to know to operate in a manner acceptable to others in society, children and adults must know what forms of verbal and nonverbal behavior are appropriate in which social context. This requires knowing what context one is in and when contexts change. We think that the capacity for monitoring contexts must be an essential feature of social competence (Hymes, 1974). We will detail some theoretical and methodological issues in our ways of studying how people are able to decide *when* a context is, as well as *what* it is.

How do persons assess what context they are in? What features of context do they seem to be attending to? Contexts are not simply *given* in the physical setting (kitchen, living room, sidewalk in front of

drug store) nor in combinations of personnel (two brothers, husband and wife, firemen). Rather, contexts are constituted by what people are doing and where and when they are doing it. As McDermott puts it succinctly (1976a), people in interaction become environments for each other. Ultimately, social contexts consist of mutually shared and ratified definitions of situation *and* in the social actions persons take on the basis of those definitions (Mehan et al., 1976).

These interactionally constituted environments can change from moment to moment. With each change, the role relationships among participants are redistributed to produce differing configurations of concerted action. Sociolinguists have been studying such configurations, called participant (or participation) structures by Philips (1972, 1974), and have shown them to be marked by ways of speaking, ways of listening, ways of getting the floor and holding it, ways of leading and following. Differing participation structures may not only be juxtaposed back to back across time in getting from one social occasion to the next, e.g., from playing cards to riding the fire truck, but differing participation structures can also alternate within a single occasion, e.g., a card game may contain the primary constituent "slots":/getting ready/, /playing/, and /winding up/ (Mathiot, 1976; Pike, 1967; Goffman, 1974). Each slot can be expected to be marked by different distributions of speech events and speech functions.

Language-centered analysis here articulates with the postural-kinesics (body motion) research of Scheflen, whose pioneering "context analysis" of group psychotherapy interviews (1973, 1974) stands to date as the most comprehensive treatment of the sequential juxtaposition of differing participation structures within a single interactional occasion. Scheflen identified differences in interactional activity from one principal part of the therapy session to the next, and identified the major junctures between primary parts. He found, as did Kendon and Ferber (1973), McDermott (1976a, 1976b), Schultz (1976), and Bremme (1976), that during junctures between principal parts of occasions, major reorientations of postural configurations (positions) occur among participants, and that across the duration of a principal part, these positions are sustained collectively. We have reported a related finding for changes in interpersonal distance (proxemic shifts) between speakers (Erickson, 1976a).

Postural and proxemic configurations are instances of a general class of culturally conventional signals, termed contextualization cues by Gumperz (1976). These signal how messages are to be interpreted from moment to moment. Some cues usually apply as diacritical marks to behavioral slots of relatively short duration, such as words or phrases. Other cues, such as postural shifts, seem to mark the boundaries of slots that are longer in duration. At any rate, what one sees and hears at the junctures between principal slots is a redundancy of contextualization cues (Fitzgerald, 1975). The multimodal nature of communication produces great modality redundancy across the verbal and nonverbal channels (Cook-Gumperz and Gumperz, 1976). Many dimensions of difference in performance form, in addition to the postural and the proxemic, can have contrastive relevance as contextualization cues—changes in voice tone, pitch, and other features of speech prosody; changes in linguistic code, style, and topic; changes in the tempo and rhythmic organization of speech and body motion; changes in gaze direction and facial expression; changes in the number of speakers and listeners (c.f. Hymes, 1974; Birdwhistell, 1970).

In addition to modality redundancy, participants can also rely on the sequential relationships among different behaviors to inform them of their context. It is only in sequential context that shifts in performance form, such as rate of speech, can have potential for contrastive relevance; a shift to "faster" speech is only a shift in terms of the rate of speech immediately prior to the faster rate. The combination of temporal and modality redundancy in contextualization cueing seems to function as an interactional fail-safe mechanism. It insures that, despite individual differences in interactional competence, whether due to difference in culture, personality, or level of acquisition of competence (c.f. Cook-Gumperz and Corsaro, 1976), and despite differences in individual variation in focus of attention at any given moment, members of the interacting group are likely, both collectively and individually, to "get" the socially important message that something new is happening.

Despite the redundancy of cues, it usually is not possible to determine (in informal occasions in the United States, at least) an exact moment when the definition of situation has changed. It is only after the cues for a change in context have occurred that it is possible to determine that something has indeed changed. Thus, it would seem that it is by retrospective evaluation that persons determine that the context has changed. While the change is developing, persons may perceive that something new is happening and that a change in their behavior may be called for. They may infer expectations of what will happen next. Then subsequent events may help progressively to make the definition of situation unambiguous; their expectations will be progressively confirned or disconfirmed (Mehan and Wood, 1975; Bremme, 1976). There are limits to the range of options for what can appropriately happen next. Once the selection is made and the context changes, what follows may be entailed in the selection itself.

Some evidence suggests that not only is social behavior hierarchically organized from large slots down to small, embedded slots of microsecond durations, but that processes of interactional inference or social cognition are similarly organized. As experienced in social performance, hierarchically organized activity can be apprehended only as relationships of succession across time. The relatively undifferentiated complexity of the myriad slots of activity of short duration that are strung together in interactions, like beads, in succession across time is reduced by a *plan* into a simpler order; into *slots* of proportionally long duration and high social salience within the whole occasion.

In the inferential work of interactional competence, it is as if the string of constituent events, while continuous in time, were made by social salience discontinuous in mass and texture across time. Interactional inference could be compared with fingering one's way along a rosary, rather than along a string of perfectly matched pearls.

But, because interaction is not an object but a social accomplishment, interactional performance cannot be compared with the rosary itself. Rather, it is as if all participants in interaction collectively create and sustain the rosary in feeling along it with their fingers—by what ethnomethodologists call reflexivity (a mutually constitutive interplay between expectation and action, Mehan and Wood, 1975)—the *participants become the rosary*; their collaborative doings constitute the social organization of the event. By identifying differences in the texture of their activity across time and by specifying the alternative choices that are culturally appropriate at the points of change in texture, the analyst can describe the inferences which participants make in producing a social occasion. Recent attempts at such modeling can be seen in the analysis by Sacks, Schegloff, and Jefferson of turn-taking in conversations (1974), in McDermott's analysis of the organization of classroom reading lessons (1976a, 1976b), in Mehan's studies of teaching sequences (1976), and in Erickson's analysis of the social and cultural organization of paying attention and explaining in counseling interviews (1976b).

A research group at the Harvard Graduate School of Education has been working in this area, as well, studying the social organization of such classroom activities as playing a board game (Shultz, 1976), talking with the teacher in the "circle" at the beginning of the school day (Bremme, 1976), and being interrupted during classroom events by visitors (Florio, unpublished). Recently, we have been interested in identifying shifts in participation structure within such occasions and within lessons, shifts from less formal and instrumental activity to more formal and instrumental, and back again. We find these shifts occurring between principal parts within occasions that both observers and participants in the classroom label as undifferentiated wholes when they give an initial answer to the question "What /time/ is it now?"— /lesson time/, /snack time/, /first circle time/. Within the occasion, e.g., /lesson/, we find constituent "times" of differing participation structure, with differing rules of appropriateness for paying attention, getting the floor, maintaining topical relevance, fidgeting. When children "miss" such situational shifts within an occasion, especially the shifts from less instrumental to more instrumental activity that can be glossed as "getting down to business," they are sanctioned for situationally inappropriate behavior by the teacher and by other children.

Essentially, our procedure for discovering the constituent structure of occasions consists of making judgments of *same/different* and *next* across real time. We work from audiovisual behavior records—sound film or videotape that is shot continuously with the camera moving as little as possible, keeping all the participants in the occasion within the visual frame. Usually, we begin our recording at least five minutes before the occasions we are studying begin and continue recording until after those events of interest end.

If we are using videotape, the behavior records collected at a site arrive back at the laboratory as one-hour or half-hour reels of tape. We then begin a six-stage process of viewing the tapes analytically. (These are listed in abbreviated form here. A fuller account is available from the authors.)

Stage I. This stage follows the pattern by which the material was shot in the first place. We view each reel throughout, stopping it only very occasionally, taking most notes as the tape is running continuously. These intentionally sparse notes become an index of all the major occasions on the tape, showing (by tape-deck counter numbers) the approximate location of occasions and of the transitions between occasions. At this stage, we may index a number of reels before moving on to the next stage.

Stage II. After a corpus of tapes is indexed, it is searched for analogous occasions of theoretical interest, e.g., all /lessons/, all /snacks/, or whatever. We choose one instance of a kind of occasion for more detailed analysis, record it on a copy tape, and use a time-date generator to print digital-clock numbers on the tape to insure an accurate analysis of timing. At this stage, we attend mainly to the junctures between parts, rather than to the parts themselves, both because the junctures have theoretical salience for us and because the pile-up of temporal and modality redundancy at junctures makes these moments discontinuous in interactional texture from those preceding and following them in time. During the juncture, one sees the most intuitively obvious

shifts in communication behavior form, nonverbally and verbally, including changes in postural configuration.

The following two procedures have proven useful at this stage of analysis. First, we organize our descriptions on a chart with a continuous horizontal time line, indicating on the chart the approximate temporal location of junctures between principal parts and characterizing the parts themselves in terms of very general features of participation structure and topic, or main, activity. This chart provides a synoptic "wide-angle" picture of the structure of the whole occasion.

Second, we interview participants in the occasion in a *viewing session*, asking them to stop the tape as often as they can while viewing it with us, as often as they sense something new is happening. As they stop the tape, we elicit their characterizations of what is happening and what could reasonably be expected to happen and *not to happen* next. By this procedure we get a sense of the participants' points of view as members.

Stage III. Here we locate precisely the junctures or transition sections between primary parts of the occasion, and identify specifically the differences in participation structure across the junctures. We note the changes in postural position, speech prosody, and any other features of speech style and topic that occur before, during, and after the juncture. Often we diagram the postural positions and distance relationships among the participants, the direction of gaze and shifts in gaze, and transcribe along a time line the speech of all participants. All this information is organized onto a second chart, which is like an enlargement or close-up photograph of one portion of the wide-angle picture of the whole occasion that was provided by the synoptic chart prepared at Stage II of the analysis.

Stage IV. Here we attend primarily to the participation structures ahead of the junctures we have focused on in detail in Stage III. We go to each principal juncture of interest and rewind the tape back to the next previous principal juncture. In replaying the whole segment between the two junctures, we characterize the participation structure between them in fairly broad strokes, relative to the level of detail with which the subsequent juncture and its immediate surround was described, i.e., we may not transcribe all the speech or chart all the gestures of all participants for the whole participation structure between junctures. Rather, we try to attend to the intuitively "biggest" things that are happening—what postural positions are sustained, what the topics of talk are, who does most of the talking and listening, what general interactional strategies are occurring across the whole segment that can be glossed in ordinary language, e.g., /getting ready to start/, /dealing with the main issue/, /taking time out/. We do not attempt exhaustive description, but analytic description for the purpose of model construction.

Stage V. At this point, we attempt an initial test of the validity of our model of interactional structure. In the previous stages, we have been constructing a model derived from analysis of a single case—*a type-case analysis*, in the terminology of Gumperz (personal communication). In the type-case model, we propose to show principles of social organization underlying the surface form of communication behavior in interaction. In particular, we are interested in demonstrating the contrastive relevance to participants of contextualization cues at principal junctures within an occasion.

There are four types of evidence from which inferences can be drawn as to the social significance manifested in particular configurations of performance form. These are the requisite testing points for a single case-derived model of interaction:

1) During those moments the model designates as moments of transition, descriptively specifiable shifts in interactional performance form are occurring.
2) After a moment of transition, specific forms and functions of communication behavior—ways of listening and speaking, topics, postural positions, etc.—are differently distributed in contrast to their frequency of presence or absence and their sequential position of occurrence during the time prior to the moment designated by the model as a moment of transition.
3) After the moment of transition, kinds of interactional behavior, which, before the juncture were sanctioned if present (or absent), are no longer sanctioned by participants if these behaviors are present (or absent), and kinds of behavior previously not sanctioned are now sanctioned, i.e., participants behave as if rules of appropriateness differ from before the juncture to after it (Mehan and Wood, 1975; McDermott, 1976b).
4) If, in a viewing session, the participants themselves or other informants are shown the juncture and its immediate surround, their accounts of what is socially appropriate before and after the juncture agree with analytically descriptive evidence of types (2) and (3) above.

Stage VI. This final stage involves establishing the generalizability of the single case analysis conducted in the previous five stages. Here we search our indexed corpus of tapes for analogous instances of whatever kind of occasion we were investigating. We view all the occasions and locate all instances of whatever phenomenon we are investigating, e.g., all shifts from less instrumental to more instrumental activity within a lesson. Then we examine all instances in the corpus (or a systematically selected sample of them), noting the distribution of communication forms and functions before, during, and af-

ter the juncture, as in Stage III, above, but now limiting our attention only to those communication forms and functions that had structural salience in the model derived from the single case. If, in the analysis of multiple instances, the same types of evidence obtain as those discussed in Stage V, the generalizability of the analytic model has been initially demonstrated, i.e., we have shown that the single case is typical at least within the corpus investigated.

Conclusion

We have described a theoretical and procedural approach to the study of the social organization of interaction. We have specified methods of working analytically from the top down through the structure of interactional behavior to construct models of social organization of behavior. We think these models are congruent with the ways participants in interaction must be construing interaction as it happens, attending first to longer segments as gestalts and then to shorter ones embedded within the larger frames. Type-case models of interactional structure point to what a collectivity of members needs to know in order to produce the interaction.

The methods we have described can apply to a range of problems in the analysis of communication structure and interactional competence.

A theory of the interactional construction of social contexts is crucial to an understanding of how communication forms come to manifest social, as well as referential, meaning. One way of studying how contexts are socially generated and sustained in face-to-face interaction is to study the processes of organization by which contexts change from moment to moment and the processes of social cognition—interactional inference—by which participants monitor verbal and nonverbal indicators of such change.

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The Cultural Underpinnings of Psycholinguistics: A Comparative and Developmental View

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Because psycholinguistics once was defined as a merger of learning theory, information theory, and pre-Chomskean linguistics, it is perhaps not surprising to find the sociocultural dimensions of language virtually missing from the theoretical and empirical work of the field. The old definition provided an unfortunate and overly circumscribed definition for the field, as suggested by a close reading of sociolinguists of the last decade (Gumperz and Hymes, 1972; Labov, 1972). To combat the notion that a single cultural group has a single language, sociolinguists focused upon the structural variation inherent within a language community. The demonstration of lawful variation as a function of such factors as the social situation and the participants' relationships to each other carry vast difficulties for the conventional approach to psycholinguistics.

In particular, it raises the following problems. Do we learn just one "deep" grammar, wherein a different subset of the rules applies to each special language variety, or do we learn a whole set of separate grammars for each situational variety and only later come to view the set as representative of a "single" grammar? When can we first detect the presence of language variation in first-language acquisition, and does this variation occur at all levels of language—phonetic, morphemic, stylistic, etc.? Does the child learn one variant first, or does he gain competence in all variants simultaneously? How does he learn to focus on the variants—through situational comparisons? How are these different variants of language stored in memory? Does the psychological similarity of one variant interfere with the performance of another closely structured variant; is there some developmental "transfer of training" across the variants or are the variants learned separately? To what degree are language-users overtly aware of the rules by which to convert some stylistic variants into other variants?

Many, many other questions can be generated by applying the sociolinguistic perspective to conventional psycholinguistic topics. My purpose in raising these issues is to suggest that a broader theory of psycholinguistics is in the making, and is a necessary extension of current theory. In the remainder of this article, I shall survey a few of the results that could aid us in redefining the field.

Multi-sentence discourse contexts. A volume edited by Freedle and Carroll (1972) in part broke new ground by suggesting that the string of sentences which comprise the meaning of a discourse text are not related simply to the string of words in the sentences. There is also information outside of the sentence that is brought to bear on the meaning of the text. A clear and important demonstration of this principle within a more sociolinguistic perspective has been provided by Nix and Schwartz (1977). They attempt to demonstrate that different semantic presuppositions and discourse frames operate for individuals who come from nonmainstream language communities. The following passage was read aloud by Black and Chicano students in New York City; each student, who was individually tested and interviewed, had to complete the passage by choosing which word makes the most sense at the end of the section: "Sally loved animals. She brought home every stray animal that she could find, no matter what it looked like. Her mother declared that she adopted any animal as long as it was: A. lively, B. alive, C. large, D. lame."

Most members of the majority culture pick option B (alive), but members of the minority subcultures tend to choose option A (lively). To investigate why this happened, an extensive interview was carried out to see how each person justified his or her choice.

It is difficult to do full justice to the novel analysis that Nix and Schwartz bring to bear on their data, but the gist of their findings is that when option B (alive) was chosen, the passage was subjectively organized into a topic-comment discourse frame; when option A (lively) was chosen, it was internally represented as an action-reaction discourse frame. The knowledge that was activated—cultural schema activation—to explain why they chose *lively* was that "lame animals cause expenditures of money and it is not a behavior indulged in by sensible people," whereas when *alive* was chosen, the rationale was that "bringing home disabled animals is humane behavior sanctioned by the community." With regard to normative language use, the option *lively*, rather

than *alive*, was adduced as correct because *alive* represents a truism and thereby is a violation of normal language use. However, the normative use of *alive* by the majority group elicited a stance of hyperbole and exaggeration that is consistent within the group's interpretative schemata. The point is that each answer is correct when one knows which cultural organizers are operating at the discourse-frame level. Nix and Schwartz further explore an extensive semantic network method to clarify the complexity of this representation.

Another consequence of the sociolinguistic perspective at the discourse level was examined by Freedle, Naus, and Schwartz (1977). The social variable of interest to them was the *age* of the listener to whom the experimental subject (an adult) had to retell some passages. Dramatic changes at the intonational, lexical, sentential, stylistic, and discourse-frame levels were found. When an expository passage was to be retold to a four-year old, for example, a narrative mode, sing-song ("baby-talk") intonation, dramatic lexical simplification, and an attempt to engage the listener actively in dialogue rather than to carry out the retelling in monologue were used. But when a narrative passage originally intended for a child was to be retold to an adult listener, increased complexity occurred and an expository mode was adopted—in short, a formal language-register regulated all levels of language usage. Furthermore, many aspects of these language variants were directly accessible to the experimental subjects; they were able to verbalize many of the "rules" which they had used to make their retellings conform to the age characteristics of their listeners. The study raised further issues concerning how the memory for the "raw" surface assertions of the discourse had been affected by the social-age variable.

Kernan (1974) studied formal and colloquial language styles to ascertain their effect on first-language acquisition of Samoan children. He found, surprisingly, that although the colloquial style was directed primarily at children, those children first learned the formal style. The developmental progression of how the two styles were mastered by individual children was fairly complex, and the interested reader is referred to the original article. However, Kernan's work shows the need for making developmental psycholinguists aware of the higher-order properties of social discourse that are demonstrated sociolinguistically. The many cognitive issues he raised about how children focus selectively on the existence of these language varieties, and how they then selectively learn one or more of them at a time, is of the utmost importance. For a further discussion of this work from a psychosocial and methodological perspective, see Freedle (1975, 1976).

Single-sentence contexts and cognitive dialect structuring. In a number of publications, William Hall and I (Hall and Freedle, 1973, 1975) have explored the cognitive consequences of individuals who are members of an embedded subculture within a dominant majority culture. The results of one study, in which single sentences were presented in either of two dialects (Standard or Black English), suggested that cognitively the dialects are separately represented in the older children studied (eight- and ten-year-olds), but may be represented as a single system in preschoolers (five-year-olds). A model of the cognitive decisions that result from such social variables as race, age, and socioeconomic status (SES) were presented in Freedle and Hall (1976). This work indicates the need for adding more higher-order cultural levels to the information-processing models that currently dominate the psycholinguistic literature. A way to explore the cognitive effects of bilingual language-learning in either a mono- or bicultural environment is discussed by Riegel and Freedle (1975).

Prelinguistic development and the origins of language variation. Whereas Kernan's results described above point to the need for exploring stylistic variation in first-language acquisition, the work of Freedle and Lewis (1971, 1977) and Lewis and Freedle (1973) suggests that even at the pre-language stage (age three months!) one can detect systematic *variation* in the probability of an infant's emitting a vocalization as a function of its situational setting, its sex, and the SES of the family. Of course, a monotonic ordering of the probabilities of a vocalization is not always found as a function of these social variables. But *situation* serves eventually as an eliciter of formal and informal styles in adults, and SES further orders the magnitude of many sociolinguistic measures (Labov, 1972). That both situation and SES relate to an infant's vocalization strength raises the intriguing possibility that these primitive vocalizations may already carry language-variation information within them. Some of the prelinguistic measures do correlate significantly with such global indices of language development as mean-utterance at age two years (Freedle and Lewis, 1977), but what remains to be demonstrated is a link between the language variants that appear at age two (situationally and topically defined) and the pre-language probabilistic variations that have been observed to occur at age three months.

Overview. A new and socially more mature psycholinguistics seems within our grasp. To accomplish it, we must supplant post-Bloomfieldian linguistics with sociolinguistic measures obtained from naturalistic study, and we must also supplant information theory with what I have called nonlinear decisional systems (see Freedle, 1975). The replacement of S-R learning theory with a cognitive processing

orientation is, of course, already one of the achievements of a new psycholinguistics.

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Remediation of Psychometric Artifacts in the Measurement of Differential Deficit: A Comment on Traupmann's Critique

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Because schizophrenics show a generalized performance deficit, most investigators of cognitive deficit in schizophrenia have not attempted to specify a simple deficit in a single ability, but rather a differential deficit, that is, a greater deficit in one ability than in at least one other. In previous publications (Chapman and Chapman, 1973a, b; 1974; 1975), we have pointed out that most published studies of differential deficit in schizophrenia suffer from a shared defect of design. Psychometric characteristics of two tasks result in a lower score on one of the two, simply as a function of generalized deficit. Specifically, the task with the greater true-score variance, which is the product of the reliability and the obtained-score variance, is expected to yield a greater disparity in mean score between the better-performing and the poorer-performing groups of subjects, regardless of whether one group is schizophrenic. Schizophrenics usually perform more poorly than normal subjects, and would be expected to differ more from normal subjects on the one of the two tasks with the greater true-score variance. (Traupmann stated that the test with the greater variance will be the test that is less sensitive to group differences. Actually, the reverse is true; the test with the greater variance of observed scores is generally the more sensitive to group differences because the greater observed-score variance usually reflects a greater true-score variance.) The solution is to match tasks on variance and on reliability. Both variance and reliability are highly sensitive to item difficulty. If an investigator matches two tests of the same format and type of content on distribution of item difficulty, he will usually find that he has achieved adequate matching on both variance and reliability. The 50 percent level of difficulty yields the optimal, that is, the highest, reliability and variance for free-response items, but higher accuracy is optimal for multiple-choice items. This difference between multiple-choice and free-response format reflects the greater contribution of chance to a correct response on multiple-choice items. Further details are spelled out in our earlier publications.

Traupmann (1976) objected to matching tasks on the grounds that it leads to selection of atypical items. We will discuss his objections for two types of studies of differential deficit—those in which the items of

two kinds of tasks differ inherently in difficulty for normal subjects because of the nature of the variable being studied, and those in which the items of the two kinds of tasks do not so differ. The difficulty of the two tasks usually differ when the same items are given under two different conditions. As an example, Traupmann pointed out that several investigators, including himself (Traupmann, 1975), found that schizophrenics recall fewer items than do normal subjects, but are closer to normal performance on a recognition task. He stated that normal subjects also are more accurate on recognition tasks than on recall tasks, and he objected that "psychometric doctoring," undertaken to equate recognition and recall tasks for difficulty, would result in selection of items that are atypical of the total pool of items. He concluded that our recommendation of the matched-task design is inappropriate.

We would never wish to recommend such simplistic matching for this kind of study. Matching tasks on difficulty is only a means of matching on true-score variance. Matching a free-response test with a multiple-choice test on difficulty would be unlikely to result in equal true-score variance, because a different difficulty level maximizes reliability and variance of items of these two formats. In addition, we would agree that if two kinds of items differ inherently in difficulty for normal subjects, one ought not choose atypical items in order to match subsets of the items on psychometric characteristics. One solution for such cases is the design of two matched variables, which we have described previously (Chapman and Chapman, 1973a; 1974; 1975). In Traupmann's example, the experimental variable would be that of recall vs. recognition. We maintain that the second variable should be one which, the investigator hypothesizes, has less to do with schizophrenic deficit than does the experimental variable. The second variable might, for example, be obscurity of the word. Each variable is a stimulus dimension of difficulty for normal subjects. The investigator matches paired subsets of items at various points on the two dimensions of difficulty. He selects items for the two variables so that the two error curves of normal subjects are equivalent. One subset of items should be as reliable as the other at any given level of accuracy. The tasks are given to a new normal control group, as well as to a schizophrenic group. The hypothesis is that an increase in difficulty on the experimental variable will produce a greater increase in errors for schizophrenics than will an increase in difficulty on the control variable, despite their equivalence for normal subjects. Figure 1 shows the hypothesized result.

The price one pays for avoiding a psychometric artifact in this case is a more complex hypothesis. Instead of simply testing whether manipulating an

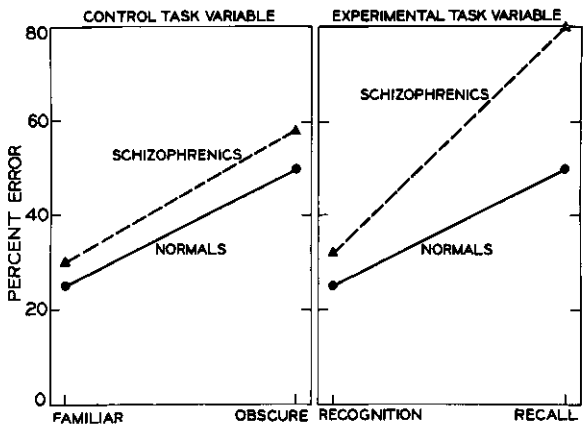

FIGURE 1.
A hypothesized result, using the design of matched variables.

experimental variable (e.g., recognition vs. recall) produces a deficit for schizophrenics, one tests whether schizophrenics will show a greater increase in deficit in response to the experimental variable than to a control variable (e.g., obscurity of words). More than one control variable is desirable to support the generality of the conclusion that the experimental variable taps a process which is more important than other processes in schizophrenic deficit. (The interested reader should see our earlier discussion of this design for fuller explication.)

Traupmann also extends his criticism to cases in which the two kinds of items do not differ inherently in difficulty. (This is his discussion of two tests that do not consist of the same items presented under two conditions.) Traupmann again objects that the matching of tasks will be achieved by systematic selection of atypical items. He did not offer an example, so let us illustrate the point with our own study (Chapman, Chapman, and Daut, 1974) of the hypothesis that schizophrenics have greater deficit in defining emotional than neutral vocabularies. We achieved equal variance and reliability of an emotional vocabulary test and a neutral vocabulary test by selecting items for the two tests with equivalent distributions of item difficulty. Traupmann suggested that "the particular form that the group X test interaction takes may be due entirely to the particular items selected." We must disagree completely. The kind of item-selection involved in matching such pairs of tasks on variance and reliability is no different from that involved in many other experiments in which one manipulates a variable.

For example, Traupmann (1975) presented four lists of words in which he simultaneously manipulated susceptibility of the words to imagery and to the ease with which the words could be categorized. Thus, he matched his high-imagery and low-imagery

words on the ease with which they fell into categories, and simultaneously matched his high- and low-categorizability lists on imagery. In addition, all four lists were matched on meaningfulness. He obviously had to choose some words and reject others to manipulate such variables. In fact, more extremely atypical words would appear to be required for, say, a list of high-imagery but easily categorized words of specified levels of meaningfulness than for a list of emotional words of specified levels of difficulty. We do not suggest that Dr. Traupmann's selection of atypical words was other than exemplary experimental procedure. Our point is, instead, that selection of words for matched tasks is no more hazardous than conventional applications of the experimental method. Any objection to matched tasks on the grounds of systematic selection of atypical items should be extended to manipulation of other variables.

Traupmann has suggested that an alternative strategy for combating psychometric artifact in differential-deficit designs is the study of processes that account for schizophrenic deficit. We would point out that the principles of design that we have advocated for demonstrating differential deficit of ability are equally applicable to the study of the processes that account for deficit in ability. If an investigator manipulates an experimental variable, he may produce, in effect, a series of subtasks that differ on true-score variance for normal subjects. These subtasks will then differ on the mean difference that they yield between the more able and the less able subjects.

The use of matched tasks does not require an exotic selection of items. For testing most hypotheses concerning schizophrenic cognition, tasks can be matched with a small amount of effort and without selecting items that are atypical on relevant psychological characteristics. We believe that anyone who tries the method will agree.

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HEIDER, E. R., CAZDEN, C. B., and BROWN, R. 1969. Social class differences in the effectiveness and style of children's coding ability. *Project Literacy Reports*, No. 9, pp. 1–10.

This follow-up study to Heider's Harvard doctoral thesis is relevant to the concerns of students of comparative research. Heider had found strong social-class differences in encoding style: middle-class (MC) children gave more analytical descriptions, lower-class children more holistic, metaphorical descriptions. One possible explanation of these differences might be that MC children have been somehow socialized to give attributes or dimensions to their environment, even when not required to do so. We tested this hypothesis in an analysis of the latent learning of 11-year-old White boys. The hypothesis was not confirmed: we received virtually the same information from the two social-class groups, but there was a significant social-class difference in the number of questions the listener had to make in order to elicit the requisite information. Our concluding remarks have general relevance: "This finding raises questions about social class differences which arise in experimental situations or classrooms where such controls (on the amount of probing) usually exist. There are undoubtedly class differences in dispositional and motivational variables; and there are undoubtedly class differences in cognitive abilities as well. One important problem—in research as well as in education—is how not to get the two mixed up." If the original publication is not available, see pp. 194–5 (in section on coding ability) and p. 267 (in appendix on tests) in Cazden, *Child Language and Education* (New York: Holt, Rinehart and Winston, 1972), for more details.

COURTNEY B. CAZDEN

VULPE, S. G. 1977. *The Vulpe Assessment Battery, Developmental Assessment, Performance Analysis, Program Planning for Atypically Developing Children.* Toronto: National Association for Mental Retardation, York University Campus, 4700 Keele St., in press.

One aspect of assessment is to determine the range of situations in which a child's competencies are manifest. This requires sampling on some principled basis. Vulpe and her colleagues have attempted this in their assessment

system for children with special needs. Their "performance analysis scale" is based on the concept of "engagement" as an expression of child/environment interaction. Rather than rating only behaviors that the child demonstrates under fixed conditions, it includes procedures for looking at the ways in which changes in the social or physical environment effect changes in the child's pattern of response. Although the scale is designed for children under three years of age, the underlying ideas have more general application.

COURTNEY B. CAZDEN

McGARRIGLE, JAMES, and DONALDSON, MARGARET, 1974–5. Conservation accidents. *Cognition*, 3(4):341–350.

Piagetian research on cognitive development has been applied to studies of children and adults in many cultures. Inferences drawn from such studies relate to the logico-mathematical ability displayed by the subjects on certain standard tasks. Some of the most well known are tests of conservation, in which subjects are asked to display their understanding that substances or objects remain equivalent despite the perceptual transformation of one of the entities. (For example, one of two plasticine balls may be rolled into a sausage shape.) The results of such tests are used to help establish the onset of logico-mathematical, operational thought. While such tasks are now taken as standard within both psychological and educational settings, misgivings have been expressed by some as to the universality of the inferences about cognition that can be drawn from the results.

What does the child believe he or she is being asked to do? How is the problem interpreted? Are there ways of interpreting the problem which are "logical" in senses other than those Piaget would allow? These are the kinds of problems that have begun to worry researchers.

The study by McGarrigle and Donaldson extends this work by showing that nonconservation responses in conservation tasks that usually are interpreted in terms of perceptual dominance can, in fact, be seen as a function of the child's interpretation of the nature of the task itself.

McGarrigle and Donaldson gave children standard conservation of length and number tasks, but also varied the child's interpretation of a task by, in one condition, introducing a "naughty teddy bear" who "messed up the game," and so permitted an accidental transformation, rather than the intentional transformation of the conventional procedure. Only 13 out of 80 five-year-olds conserved in the intentional transformation, but 50 succeeded in the "accidental" procedure.

These findings suggest that conventional Piagetian tests may underestimate performance, and also point to the interpretation of context as a central feature to be considered in explanations of both performance and development.

VALERIE WALKERDINE

WOLFRAM, W., and CHRISTIAN, D. 1976. *Appalachian Speech*. Washington, D.C.: Center for Applied Linguistics.

The final chapter, "Educational Implications of Dialect Diversity," includes an excellent section (pp. 133–145) on sociolinguistic perspectives on test bias. Differences in linguistic form, testing as a social occasion, and task bias are discussed with extensive analysis of examples.

COURTNEY B. CAZDEN

MILLER, ROY A. 1975. Do the Japanese know how to tell time? *Journal of the Association of Teachers of Japanese*, 11: 1–18.

Miller tackles some apparent inconsistencies in the use of past and present verb forms in contemporary Japanese fiction to show a deeper order in the use of tense markers to convey a sense of "whether a given action was or is completed." Of course the Japanese know how to tell time. But the particulars of what they know, that is, the particulars of how they manipulate the tense markers of their language to convey certain messages, are more difficult for an analyst (including native speakers, apparently) to discern. Miller breaks the impasse and carefully demonstrates how the Japanese use the contexts afforded by surrounding verbs and the larger passages in which they appear to accentuate certain temporal aspects of their verb forms. This kind of careful analysis of language use can speak to cross-cultural researchers who want to move too quickly from an analysis of grammatical form to a conclusion about cognitive style. Without an accompanying analysis of how grammatical forms are used in the negotiation of meanings in particular texts, given particular contexts, cognitive conclusions are not viable.

R. P. MCDERMOTT

KIRK, LORRAINE, and BURTON, MICHAEL. 1977. Meaning and context: A study of contextual shifts in meaning of Maasai personality descriptors. Social Science Working Papers #115, November, 1976. *American Ethologist*, in press.

This paper won the 1976 Stirling Award in Culture and Personality of the American Anthropological Association. In it, Kirk (University of Missouri, St. Louis) and Burton (University of California, Irvine) investigate the relationship between ascribed personality traits and social identity categories among the Maasai of Kenya. Basic Maasai age/sex identities include young boy, older boy, warrior, adult man, young girl, and adult woman. Each of these social identities was used in a triads test, in which the three items to be compared were personality traits. In addition, one group of Maasai informants was given the traits without an associated social identity. Judged similarity measures for each test were scaled to produce a multidimensional scaling configuration for the traits. For example, it was found that in the context "young boy," traits which were valued positively included playfulness, success, bravery, respectfulness, cleverness, and disobedience, whereas a young boy was not supposed to exhibit stinginess, or to be realistic, skittish, alert, lazy, or fickle.

Three findings are of special interest to those engaged in cross-cultural research. First, the judged similarity of personality traits in isolation from any social identity nevertheless appears to relate to social identity with specific characteristics. The pattern closely resembles the trait pattern for the sex identities that are unmarked with respect to the major dimensions which emerge from

the study—marriageability, responsibility, and power. Maasai subjects appear to supply the social identity "typical married, responsible, but not powerful person" when no particular social identity is provided. Second, the salient dimensions in the scaling configurations are the social dimensions just described, not the semantic dimensions of sex and age, as Kirk and Burton originally expected. Third, a multidimensional scaling analysis was used to establish patterns of change over a time scale, in this case the life cycle. By comparing scaled configurations, it was possible to characterize the severity of changes expected in personality trait configurations across succeeding identities, and to specify the nature of these changes.

The results were surprising in that the degree of discontinuity in expected traits at different points in the life cycle was much more extreme than theoretically informed intuition might lead us to expect. Consider the sequence young boy, older boy, warrior. Young men in the warrior category cannot marry or control property, and are required to live apart from village family life. They are said by Maasai to be "like children." Kirk and Burton show that this is no idle metaphor. In fact, it accurately reflects the high degree of similarity of expected personality traits of young boys and warriors. This is especially interesting because older boys are expected to display quite different characteristics from the other two categories.

This paper should be of great interest to personality theorists. It should also be useful to cross-cultural researchers interested in working with groups of subjects who differ on socially shaped sex and age categories.

JEAN LAVE

LEWIS, MICHAEL, and ROSENBLUM, LEONARD (Eds.). 1974. *The Effect of the Infant on its Caregiver. The Origins of Behavior.* Vol. #1. New York: Wiley-Interscience.

This is the first volume of a series devoted to the study of human behavior from a developmental, interdisciplinary, and interactional perspective. Other volumes in this series deal with the origins of fear, the development of friendships and peer relationships, and the development of language competence.

The focus of this first volume is the growth of social relationships between infants and their caregivers. In contrast to those socialization studies which depict social development as a unidimensional transmission from the initiated to the uninitiated, the articles in this book examine how infants and caregivers reflexively influence each other's behavior.

Bell reviews current research which shows that infants play an important role in determining the caregiving activities of the parent. They play active parts in the development of social relationships by initiating, responding, and terminating social interactional "bouts."

Lewis and Lee-Painter challenge the validity of studying dyadic relationships by treating elements of either partner's action in isolation. They call for methods for studying sequences of interaction that are not atomistic, but are sensitive to the direction of interaction, its density and simultaneity.

Brazelton, Koslowski, and Main report that infants as young as three weeks distinguish between inanimate and human objects by marked differences in their attention, vocalizations, smiling, and motor behavior. They found that infants systematically withdraw from interaction after regular periods of attention to objects and people. When mothers are sensitive to this attention-nonattention cycle, they can develop a synchrony of interaction with their infants that leads to longer interaction, and what observers characterize as a sense of positive communication between them.

Caregiver-infant interaction is not restricted to a single modality. Fraiberg finds that blind children develop behavioral repertoires with their hands that become increasingly differentiated in the first six months. If the caregiver learns this language, attachment seems to develop that is similar to that between caregivers and sighted infants.

This series stands as a significant collection of studies for their methodological rigor, findings, and resultant theoretical position. Methodologically, we see the benefits of closely examining film of adults and children from a holistic perspective. The results are that infants are found to be more competent than previously reported in the developmental literature. Theoretically, this is a contribution which reveals human behavior to be mutually structured in sequentially organized interactional encounters.

MARGARET M. RIEL

BOGARTZ, RICHARD. 1976. On the meaning of statistical interactions. *Journal of Experimental Child Psychology,* 22:178–183.

Many psychologists involved in comparative research have urged the use of Groups X Tasks designs (with more than one level on each variable) as a means of making more firmly based inferences about group differences in cognitive performance. For example, in Ann Brown's work (Department of Psychology, University of Illinois, Champaign), retarded and normal children are compared on two kinds of tasks which differ theoretically in a specific process (verbal rehearsal) to test hypotheses about memory differences between retardates and normals. The difference between groups on one task and the absence of difference on the other is taken as evidence that the specified process does indeed differentiate the two groups.

Bogartz argues convincingly that the statistical treatment of interactions is moot in many cases with respect to process inferences. As an illustration, he uses a study of age differences in the effects of distractibility. One set of authors argues that a lack of interaction implies no differential effect of distractibility, but Bogartz demonstrates that the results could just as plausibly indicate a differential effect, depending upon assumptions about the relation between age and rate of forgetting.

This article deserves serious attention by anyone doing experimental, comparative research.

MICHAEL COLE