



THE QUARTERLY NEWSLETTER OF THE  
*LABORATORY*  
*OF*  
*COMPARATIVE*  
*HUMAN COGNITION*



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Center for Human Information Processing  
University of California, San Diego

# THE QUARTERLY NEWSLETTER OF THE LABORATORY OF COMPARATIVE HUMAN COGNITION

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## Introduction

The contributions to this issue of the *Newsletter* address several issues of continuing interest. Suzanne Gaskins and Artin Göncü report data on symbolic play among Yucatec Maya children and discuss their implications for the developmental psychological theories of Lev Vygotsky and Jean Piaget. As described by the authors, the symbolic play of Mayan children is not valued by their elders, does not involve the kind of imaginative transformations characteristic of play upon which Vygotsky and Piaget's theories were based, and does not occupy much of children's time. Neither Vygotsky nor Piaget addressed the issue of possible cultural variations in this kind of activity, so the data are clearly of theoretical as well as empirical interest.

Although James Wertsch and Jennifer Bivens wrote their paper on the relationship between social and individual psychological process and not play, they too discuss the relationship between Vygotsky and Piaget in a manner relevant to the Gaskins and Göncü interpretation of the similarity between these two theorists' approach to play. It is difficult to understand, for example, how to reconcile the Gaskins and Göncü conclusion that Vygotsky views play as originating in individuals with the Wertsch and Bivens characterization of Vygotsky's ideas. At the same time, the Wertsch and Bivens article reinforces the need for the kind of research reported by Gaskins and Göncü.

Brian Coyle reports on an unusual experiment which attempts to use social science research and theory to guide an agricultural extension project in rural Sierra Leone. His work represents both an unusually sensitive relationship to the practice of research and an important cautionary tale about the application of ideas such as the provision of "appropriate technologies" in support of economic development in the Third World. His critical approach to his own efforts as well as to the broader area of policy that his work addresses, provides important lessons for all researchers who seek to relate psychological research to everyday practice.

We end this issue with a brief announcement from the Institute of Psychology, Russian Academy of Sciences, about their research interests and accessibility via e-mail and a report of work-in-progress about a project in international joint activity mediated by telecommunications networks.

## Cultural Variation in Play: A Challenge to Piaget and Vygotsky<sup>1</sup>

**Suzanne Gaskins<sup>2</sup>**

*University of Pennsylvania*

**Artin Göncü**

*University of Illinois at Chicago*

The symbolic play of a young child is thought to demonstrate newly developed cognitive capacities, serve important cognitive, emotional, and motivational functions, and by so doing, potentially influence the child's development. In a previous paper (Gaskins & Göncü, 1988), we considered the claims about symbolic play made by the theories of Piaget (1945) and Vygotsky (1978). We argued that the two theories differed in emphasis—Piaget focused on the developmental origins of play and Vygotsky focused on the developmental outcomes. In addition, we suggested that by focusing on the generic child, *both* theories are unable to speak to the implications of variation in play.

Since we are both interested in cultural influences on development, we take up the issue of variation in more detail in the present paper and consider the theories of Piaget and Vygotsky in light of data on variation in symbolic play in non-Western cultures. First, so we share an example of how young children's play might *vary*, we will describe the symbolic play in a Mayan village in Yucatan, Mexico, based on the field work of Gaskins (1990a, b). Then, we will make an effort to interpret the example by using the theories of Piaget and Vygotsky and address their shortcomings.

### **Yucatec Maya Children's Symbolic Play**

To understand Mayan children's symbolic play, four generalizations about the cultural context of all kinds of Mayan children's play must be made before turning to symbolic play. First, the opportunity for play of any sort is relatively limited for Mayan children. Even children as young as three and four are often given chores to do, and by age six or seven they are kept busy with work for long periods of time. In addition, starting at age five or six many children begin to attend school in the village, which occupies them for about six hours a day during the school

**Michael Cole**

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year. In short, Mayan children have relatively little time available for playing.

Second, they have a consistent but limited number of playmates. The social organization patterns of the adult culture determines who their playmates are. A young child is likely to live with siblings or young aunts and uncles to act as both caretakers and playmates. However, he or she is *not* likely to spend any time with children outside of his or her compound, for parents feel that visiting children may pose potential trouble for relations with neighbors. Play occurs, then, with a relatively small and consistent group of close relatives of various ages.

Third, older children often are the organizers and directors of younger children's play. Older children are at times freed from their other chores to take their siblings out of the house, giving the older children license to play in the course of childcare that they otherwise would not have. Here, the play agenda is always structured by the older children, and the younger ones are merely assigned a role to play.

And finally, play is not valued by adults in its own right. Men usually prefer to see their children engaged in some productive activity. Women typically tend to permit their children to play some, but they value play only for the work time it provides them, not for any particular value that play might have for the children.

These four characteristics of play—limited time for play, limited but consistent playmates, older children dominating play, and adult disinterest in play—are the result of the Mayan culture's specific beliefs and behaviors. They provide a backdrop for our discussion here of symbolic play in particular.

An instance of Mayan symbolic play, at first glance, might look remarkably like American middle class children's symbolic play. Children playing house in both cultures might spend their time pretending to cook dinner, even though the dinner they cook in one case may be tortillas and beans cooked over a firepit and in the other, it may be hot dogs cooked in a microwave oven.

When one looks at the overall pattern of play, however, differences emerge that suggest that play represents something fundamentally different for the Mayan child than it does for the American child. First, Mayan play themes are exclusively about adult activities that are frequently observed. A list of play themes collected from a group of girl cousins illustrates this. These three girls,

age 6-10, make tortillas, go to town on a truck to go shopping, take corn to be ground into tortilla dough, sweep, wash dishes, go to the cornfield, go to church, draw water from the well, prepare for a dance, wash clothes, go to the store, sew, ride horses, and have bullfights. Most of these are daily occurring adult activities, and the others are very important ones.

Secondly, there is little elaboration or introduction of variation or complexity during the course of play. Scripts and roles are repeated over and over, almost ritualized. These two characteristics, a limited number of themes which are focused on adult behavior and little elaboration of those themes, contrast with symbolic play in middle-class American children.

Other cultural differences are found in the types of symbolic play that do *not* appear to occur among the Mayan children. Mayan children do not pretend to be something other than people. They do not pretend to be babies or anyone younger than they are. And, they do not create imaginary people or things in their play, either as companions or as objects to act on. They rely on actual objects or co-players to fill symbolic roles.

In addition, adults do not participate in or seem to be entertained by children's symbolic play. They do not encourage their children to pretend, do not offer props or suggestions for their play, nor reward them for it with praise or attention. (See Göncü, 1987, for a description of the contrastive Western case.) In turn, children do not consult adults or monitor their reaction while playing. It is important to realize, at the same time, that because older children are actively engaged in symbolic play, younger children are shown how to pretend by the older children when engaged in joint play—receiving explicit instructions during the play sequence and given minimal leeway for expressing their own ideas.

The variations described above represent both quantitative and qualitative differences. Symbolic play clearly exists among Mayan children, but at the same time, it does not represent one of the child's primary activities. Symbolic play continues to be an interesting type of play for older children, who organize group play and participate enthusiastically. The limited number of themes seen in the Mayan child's symbolic play reflect frequently occurring adult activities. These activities are represented in play with little elaboration or variation, with no use of imaginary cast or props. And finally, symbolic play occurs only within the world of children, with older children modeling for and instructing the younger ones.

## The Theories of Piaget and Vygotsky

Such quantitative and qualitative differences as those that we have seen in the Mayan case raise important issues for both Piaget and Vygotsky. Some of these are the following: Why do such differences in play arise in the first place? Are the functions of play as articulated by the theorists universally accurate given the variations described? And does such variation influence play's role in development? Let us take each theorist in turn to consider these questions.

Piaget's argument is that symbolic play arises from the development of the symbolic function at the end of the sensori-motor stage. It is action-based support for not yet independent mental representations. Symbolic play is used for consolidation, for recapturing and reconstituting experience, as well as the pleasure derived from mastery and power of being the cause.

In general, Piaget's theory is not very helpful in explaining the kind of cultural variation we have described for the Maya. It does not address why one group of children might play more or less than another or why children might still participate in symbolic play. It would not predict stereotypic, repetitive themes focused on adult activities, or cultural variation in complexity of symbolic play. In addition, since he attributes no specific and unique developmental outcomes to symbolic play, there is no reason to believe that these variations make any difference in the child's development.

One might suspect that the social-historical theory of Vygotsky would be more useful in interpreting Mayan play. But while he embeds the child in a social world, it is our specific social world as it has developed historically, and he does not consider the implications of other quite distinct social worlds.

Vygotsky places a great deal of importance on the specific role of symbolic play in development. He argues that play serves as a zone of proximal development, allowing the child to formulate and explicitly follow rules that he or she is not yet able to in everyday life. Beyond this, he has a specific argument about the role of symbolic play in separating word meaning from objects and actions for the young child. He does not say how much a child would need to play to accomplish either of these outcomes, but one suspects it would take many and varied instances of play for this to occur.

One could interpret the repeated themes of adult behavior in Mayan play as attempts to master the rules

which organize adult interaction, and perhaps there are enough instances of such play to believe that it is possible for the child to begin to master such rules. Even so, there are many social rules a Mayan child needs to master, and *does* master as a child, that are not represented in his or her play, including ones like that of "sister" that Vygotsky himself used as an example. Vygotsky's theory does not explain why some rules might be explored in play while others are not.

The young Mayan child also succeeds in separating word meaning from objects and actions. The question is, does he or she demonstrate enough symbolic play, and is it elaborate and varied enough, to believe the child accomplishes the separation through play as Vygotsky argues? The answer would require a much more detailed and developmentally focused study than has yet been done, but it is an important issue raised by cultural variation of the type described here.

Neither Vygotsky's nor Piaget's theory would predict normal variation in play, or would help interpret the importance of the differences found among the Maya. For each of them, symbolic play is construed as a behavior of the individual child which is brought about by or serves internally generated affective and cognitive changes. Neither theory predicts what factors might influence the origin of the specific characteristics of their play. In addition, it is difficult to see how, for Mayan children, symbolic play could be serving the function of assimilation of specific experience that Piaget gives it, or exactly what function it might serve for the older children. And the variation in the nature of play described raises significant questions about the role of symbolic play in development suggested by Vygotsky.

### The Social-Cultural Component of Play

We think that play has a significant social-cultural component which is not recognized in either of these theories and which holds the key to understanding variation. The form that symbolic play takes is influenced not only by the cognitive development and the emotional needs of the child, which are the concerns of Piaget and Vygotsky, but also by the social-cultural context within which the child is developing and acting (also see Göncü, Mistry, & Mosier, 1991).

There are at least two dimensions of context that should be represented in a theory of play, both of which can vary across cultures, producing variation. The first context is the interaction context, which at a cultural level

of analysis, would be shaped by social organization. In the case of the Maya, for instance, one might argue that the play themes are limited and repetitive because play is embedded in a world in which there is no opportunity for interaction with novel children, in which predetermined roles and scripts eliminate potential disagreements (which need to be avoided since there are no other options for playmates), and in which one is expected to conform to the social guidance of one's older siblings.

The second level of context is the meaning-context—that is, the various cultural meanings that are assigned to play. In our culture we see play as an arena of development of individual skills and expression of emotions. The Maya do not. They see play as a naturally occurring behavior of children to be tolerated or contained, depending on the circumstances. These differences stem from beliefs about the nature of humankind, the forces of development in children, and the roles of children in society. Such beliefs strip play of the types of functions assigned by Piaget and Vygotsky as universal functions, and relegate play to a simpler role of escape or perhaps practice.

Once both the interaction context and the meaning context are integrated into a theory of play, one finds emerging a radical interpretation, one that goes far beyond the commonly recognized influence of context on specific content of play. Rather, the social-cultural contexts of interaction and meaning appear to influence the very structure of the child's play as it develops as well as the functions it serves, and by doing so, they also influence the roles that symbolic play may have in the child's development. While it may be the case that all young children express some form of symbolic play, a child still *learns* to play in culturally acceptable and relevant ways, as part of socialization. Symbolic play as we know it in our society, and as it was observed by Piaget and Vygotsky, becomes but one, particularly complex, culturally determined example of what play might be, rather than a presumably natural and universal child behavior (Gaskins, 1990a).

Even the categories by which we compared Piaget and Vygotsky in our previous paper need to be questioned. The relative importance of the individual psychological origins of play is diminished when we see that the younger Mayan children's play is supported socially by siblings who structure both the event and the younger child's actions within it. The relative importance of particular functions of play is diminished when one sees functions that Piaget and Vygotsky recognized, such opportunities for cognitive growth and critical emotional expression may be replaced in the Mayan culture by functions of

escape and practice. And in the case of the Maya, where symbolic play takes on a less important role in the life of the child than it holds in our own, its specific features may become less relevant as determiners of developmental outcomes.

Once one recognizes that children's symbolic play develops within the cultural contexts of interaction and meaning, and that Western children's play should be taken as a culturally specific case rather than a universal form, cultural variation in play no longer must be interpreted as evidence of deprivation or developmental delay when other cultures' children fail to show the same amount or complexity of play as our own.

In summary, Piaget and Vygotsky worked at the level of the individual in their theories of symbolic play, and provided us many insights about the psychological origins, functions, and developmental outcomes of play. But when one sees how Mayan symbolic play varies from our own, and how such theories of the individual fail to address that variation, one realizes the importance of having a theory of play that goes beyond the individual and recognizes the relevance of the culturally constituted contexts of interaction and meaning. To develop a new theory of play that would include culture, we need to know more about the cultural origins of play, the cultural functions of play, and the role of play in socialization. Such a theory will not only allow us to understand more adequately the play of Mayan children described here, but we will also gain a much more significant understanding of the play of our *own* children by realizing how their play reflects our *own* culture and prepares them to function in it.

## Notes

<sup>1</sup>An earlier version of this paper was presented as part of an invited symposium "Challenge of Cultural and Institutional Diversity to the Theories of Piaget and Vygotsky," J. Lucy (Chair) at the 1989 annual meeting of The Jean Piaget Society, Philadelphia, PA.

<sup>2</sup>She is a visiting scholar at The Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands from 1991 to 1992.

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## The Social Origins of Individual Mental Functioning: Alternatives and Perspectives<sup>1</sup>

**James V. Wertsch**  
**Jennifer A. Bivens**  
*Clark University*

Over the past decade there has been a major resurgence of interest in developmental psychology and related disciplines in the issue of how social activity gives rise to individual mental functioning. This interest grew out of a dissatisfaction with theoretical approaches grounded in individualistic assumptions—assumptions which resulted in a tendency to either ignore or trivialize the contribution of social factors to the development of mind. The growing recognition that essential aspects of mental functioning in the individual derive from social activity has led to a re-evaluation of the ideas of theorists such as Piaget (1928, 1950, 1960, 1985) and Vygotsky (1978, 1987), and it has led to the emergence of constructs such as "distancing" (Sigel, 1970, 1982), which posit that participation in certain forms of social interaction with adults allows children to develop crucial representational abilities.

Various efforts to address this issue have been united in their claim that social processes play an essential role in the formation of individual mental functioning. However, they differ over what they count as social processes, how they analyze social processes, and how they view these processes as giving rise to cognition or other forms of psychological functioning in the individual. Since these sources of difference typically remain unexplicated, it is often difficult to detect how approaches differ about the role of social factors in the formation of individual mental functioning.

In an attempt to address this problem we shall outline three perspectives on the relationship between social interaction and individual mental functioning. These perspectives are distinguished from one another on the basis of: a) assumptions about the nature of social interaction, and b) assumptions about how social interaction influences individual mental functioning. Some of the differences among these perspectives amount to complementarities, rather than contradictions (e.g., a focus on adult-child vs. child-child interaction). In such cases the perspectives do not involve conflicting accounts of the same basic phenomena, but instead focus on different kinds of social interaction and anticipated psychological correlates. In other cases the perspectives are complementary in that they focus on different aspects of the same set of social or individual processes. In these cases the lesson might be that the perspectives should be combined into a more comprehensive account. And in yet other cases there may be genuine contradictions in interpretations of the same basic phenomena.

### **Piagetian Analyses of the Role of Social Processes in the Formation of Individual Mental Functioning**

Over half a century ago, Piaget outlined an account of intellectual development that incorporated social interaction as an essential component. A fundamental assumption underlying his approach is that social interaction fosters intellectual growth by causing some sort of conflict or "discrepancy" (Sigel & Cocking, 1977; Sigel & Kelley, 1988) in an individual's cognitive system.

According to Piagetian theory (1950), individual cognitive development arises out of experiences that induce cognitive conflict or disequilibrium. In fact, Piaget (1985) argued that one of the sources of progress in development of knowledge is found in states of disequilibria since this "forces the subject to go beyond his current state and strike out in new directions" (p. 10). One way in which

this cognitive conflict can occur is when an individual's established schemes come into contact with information from the outside world that does not fit into these schemas. However, it is not simply individuals' experience with objects that results in such conflict. Indeed, individuals are quite capable of distorting information from experience with objects such that it fits with pre-existing schemas. It is when the conflict stems from social exchanges that it appears most beneficial to cognitive development, at least during middle childhood.

Piaget (1928) attributed the difficulty that children have in observing their own thought processes to egocentrism. He observed that it is often only when children engage in the process of proving and justifying to others the thoughts they have asserted that they become conscious of these thoughts and are able to free themselves from egocentrism. Thus, he claimed that it is through social interaction, especially with other children, that children find themselves forced to re-examine their own concepts in contrast with those of others. Gradually, this process of social interaction allows the child to overcome the egocentric tendencies that characterize early thought.

For this reason Piaget posited that open-ended social exchange among peers, rather than social interaction with adults, is an important factor in the growth of thought and the use of language. He focussed on exchanges among peers because such exchanges are based upon mutual, rather than unilateral relations. That is not to say that Piaget viewed social exchanges between child and adult as serving no useful function. Indeed, he argued that both adults and peers play an important role in the child's development. However, they do so in different ways.

Through imitation and language, as also through the whole content of adult thought which exercises pressure on the child's mind as soon as verbal intercourse has become possible, the child begins, in a sense, to be socialized for the end of its first year. But the very nature of the relations which the child sustains with the adults around him prevents this socialization for the moment from reaching that state of equilibrium which is propitious to the development of reason. We mean, of course, the state of cooperation, in which the individuals, regarding each other as equals, can exercise a mutual control and thus attain objectivity. In other words, the very nature of the relation between child and adult places the child apart, so that his thought is isolated, and while he believes himself to be sharing the point of view of the world at large he is really still shut up on his own point of view (1960, p. 26).

Thus Piaget argued that because of the distance between child and adult, genuine cognitive growth occurs

when children are able to engage in social interaction with other children of equal status. He contended that unilateral relations with adults foster heteronomous moral concepts, while the mutual relations provided by peers foster autonomous ones (Damon & Phelps, 1987). Indeed, recent research by Damon and Phelps suggests that adult-child interaction supports particular types of mental sets from which we can expect such cognitive products as planning, goal-directedness, means-ends reasoning, and a centering on the existing order of things, whereas peer relations foster "autonomous thinking."

For our purposes, there are several major points to be made about Piagetian accounts of the role of social interaction in the formation of individual mental functioning. First, a fundamental strength of this approach is that it highlights the active role that children take in social processes. The individuals involved are not viewed as passive observers or passive recipients of information from others. Instead, the process is understood in terms of how one perspective comes into active contact with another. It is precisely through such contact that inherent conflicts or discrepancies become apparent.

We would like to argue, however, that even though social interaction is viewed as being essential to this process, the analysis of this interaction is ultimately grounded in analytic units tied to the individual. Specifically, social interaction is considered from the perspective of how effective it is in creating conflict in individuals' cognitive systems. This tendency reflects an underlying assumption that the individual is to be given analytic priority. The basic move in constructing an analytic framework is to begin with the individual and then to consider the social; in order to understand the latter the former must be invoked but not vice versa.

Third, the kind of social interaction envisioned in this approach is presumed to exist in roughly the same form across cultural, historical, and institutional contexts. This assumption is grounded in the individualistic assumption just mentioned.

### **Vygotskian Analyses of the Role of Social Processes in the Formation of Individual Mental Functioning**

Vygotsky's approach to the relationship between social and individual processes contrasts with Piaget's in several essential ways. Primary among these is the analytic priority Vygotsky gave to social phenomena. In Vygotsky's view "the social dimension of consciousness is primary in time and in fact. The individual dimension of



consciousness is derivative and secondary” (1979, p. 30). This assumption on his part grew out of his attempts to formulate a psychological theory that would be consistent with Marxist theory, but it also was grounded in the ideas of other social scientists of his day such as Janet (1926-27, 1928) and Baldwin (1906).

Vygotsky’s assumption that the understanding of individual mental functioning begins with an account of social life underlay all of his work, and it continues to be a thread in the theoretical perspectives that are present in contemporary studies in Soviet psychology. For example, several decades after Vygotsky’s death, Luria (1981) wrote:

In order to explain the highly complex forms of human consciousness one must go beyond the human organism. One must seek the origins of conscious activity and “categorical” behavior not in the recesses of the human brain or in the depths of the spirit, but in the external conditions of life. Above all, this means that one must seek these origins in the external processes of social life, in the social and historical forms of human existence (p. 25, italics in the original).

The kind of sociality to which Luria was alluding here concerns the historically evolved institutional structure characteristic of society. Such phenomena are often viewed as falling under the heading of “macrosociological” processes in modern parlance, processes to which we shall return later. The primary focus of Vygotsky and his colleagues, however, was on dyadic and small group forms of sociality, that is forms which fall under the heading of what we shall term social interactional processes. This focus is reflected at many points in his writings, for example, in his account of the transition from social to egocentric to inner speech. Perhaps his most succinct, concrete formulation of this point as it applies to ontogenesis can be found in his “general genetic law of cultural development:”

Any function in the child’s cultural development appears twice, or on two planes. First it appears on the social plane, and then on the psychological plane. First it appears between people and as an interpsychological [intermental<sup>2</sup>] category, and then within the child as an intrapsychological [intramental] category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition...[I]t goes without saying that internalization transforms the process itself and changes its structure and functions. Social relations or relations among people genetically underlie all higher functions and their relationships (1981, p. 163).

In the West many of the most important applications of the general genetic law of cultural development have emerged in connection with the “zone of proximal development.” This zone is defined as the distance between a child’s “*actual developmental level as determined by independent problem solving*” and the higher level of “*potential development as determined through problem solving under adult guidance or in collaboration with more capable peers*” (Vygotsky, 1978, p. 86).

Vygotsky outlined the zone of proximal development in order to deal with two related issues. First, he saw it as a palliative to a view of psychological testing which focuses exclusively on the intramental plane (Wertsch, 1985; Brown & Ferrara, 1985), and second, he saw it as a key to understanding the effects of instruction. Our concern will be primarily with the latter issue. In attempts to apply his ideas in this sphere, subtle, yet major differences have emerged in interpreting the nature and function of intermental processes and how they give rise to intramental processes. In what follows we shall outline two of these interpretations: a “modelling view” and a “text mediational view.”

As we outline these views it is essential to keep in mind that they represent interpretations of Vygotsky’s ideas by others. Just as Piaget has been interpreted by various scholars in various ways, the same fate awaits Vygotsky. This need not be a bad thing. Indeed, it indicates the generative power of a major thinker. In this connection it is essential to remember that Vygotsky himself (Wertsch, 1991) expressed the desire to have his writings serve as a starting point for further theoretical development rather than as a finished product. However, the nature and implications of differing interpretations must be clarified if we are able to explicate a theoretical framework such as Vygotsky’s in a coherent manner.

### A Modelling Interpretation of Vygotsky

In a modelling interpretation of Vygotsky’s comments on the social origins of individual mental processes, intermental functioning is viewed primarily in terms of how it can provide a model for tutees’ individual mental processes. According to this view the regulative role played by tutors is gradually taken over and “internalized” (Wertsch & Stone, 1985) by tutees on the intramental plane.

This transition has sometimes been described as the transition from “other-regulation” to “self-regulation” (Wertsch, 1979; Wertsch, McNamee, McLane, & Budwig,

1980). These terms have been found to be useful in analyzing the social origins of individual mental functioning (e.g., Wertsch & Sammarco, 1985; Wertsch, Minick, & Arns, 1984). However, a few points of caution should be raised in connection with their use. First, although Vygotsky used terms quite similar in meaning to "self-regulation," he never employed the term "other-regulation." Second, the use of this pair of terms is often grounded in certain assumptions, some of which may not be consistent with Vygotsky's intent. Specifically, their use implies a kind of direct parallelism between intermental and intramental functioning, something that Vygotsky (1981; Wertsch, 1985) actually cautioned against in his comments on internalization. Finally, this parallelism implies a kind of modelling: the tutor models the appropriate forms of regulation to the tutee and the latter takes them over.

While it is far from clear that Vygotsky had some notion of modelling in mind when he spoke of the social origins of individual mental functioning, modelling interpretations of his ideas have been quite productive in generating contemporary research. In this research the process whereby the transfer of the locus of control or regulation takes place for the most part is still quite underspecified. In most cases, the claim is that by participating in intermental functioning, tutees come to organize their mental processes around the questions and directives used by the tutor. In some cases claims have been made about the role of "egocentric speech" in this process. For example, Wertsch (1979) argued that in the transition from other-regulation to self-regulation, children's egocentric speech took on the form of answers to internalized questions—questions that had previously been posed in overt social speech directives of adults. In other cases the precise forms of semiotic mediation have not been elaborated, but empirical evidence has supported the claim that psychological processes emerge on the individual plane through mastering patterns involved in the intermental process of "guided participation" (e.g., Rogoff, 1990).

In most of these studies the implicit claim is that the transition from intermental to intramental functioning takes place spontaneously, that is, without the need for outside motivation or explicit instruction. Although there are certainly exceptions (e.g., Wertsch & Sammarco, 1985), the children who have been studied have generally been found to enter into intermental functioning and to master those aspects required for appropriate functioning on the intramental plane. Investigators such as Rogoff (1990), Sigel (1982), and Wertsch (1985) have tried to identify some of the complex processes involved in this

transition. For example, Rogoff has examined some of the concrete social interaction patterns of "guided participation" involving adults and children in planning and other problem solving settings; Sigel has outlined a range of adult-child interaction patterns from the perspective of how "distancing" is created and maintained; and Wertsch has attempted to describe the various forms of adult-child interaction and their potential for fostering self-regulation on the part of children. In the end, however, we still know very little about exactly how or why the transition occurs.

Some of our implicit assumptions about the dynamics involved in a modelling interpretation of the transition from intermental to intramental functioning come to light when one considers special groups of tutees who apparently need additional assistance in making the transition from the intermental to the intramental plane. Precisely these kinds of cases have recently been studied by Palinscar and Brown (1984, 1988) in their account of "reciprocal teaching." In the practice of reciprocal teaching, students are explicitly instructed on how to lead a dialogue (i.e., pose questions usually posed by teachers) in a reading task.

Palinscar and Brown have focussed specifically on devising a set of training and assessment procedures for students at various grade levels who had been identified as having major problems in developing reading skills. The core of these procedures revolves around the practice in which students and teachers take turns leading dialogues about texts, generating summaries and predictions, and clarifying misleading or complex sections of the text.

Reciprocal teaching has produced some quite striking results. Palinscar and Brown report that at the end of a relatively small number of sessions, poor readers show remarkable improvement, noting that "by the end of ten sessions were providing paraphrases and questions of some sophistication...by the end of the sessions, unclear questions had dropped out and were replaced with questions focusing on the main idea of each text segment. A similar improvement was found for summary statements" (1984, p. 125). From the perspective of the general genetic law of cultural development the most important result was that student improvement was not limited to performance in the reciprocal teaching sessions. It extended to intramental functioning as well.

Each day, before (baseline), during, and after (maintenance) training, the students took an unassisted assessment, where they read a novel passage and answered ten comprehension questions on it from memory. From their baseline performance of 15% correct, they improved during training

to accuracy levels of 85%, levels they maintained when the intervention was terminated. Even after a 6-month delay, the students averaged 60% correct without help, and it took only 1 day of renewed reciprocal teaching to return them to the 85% level achieved during training...Remember that these scores [on unassisted assessment measures] were obtained on privately read assessment passages, that is, different texts that the students read independently after their interaction with the instructor. What was learned during the instructional sequence was used independently [i.e., on the intramental plane] by the learners (1984, p. 125).

As in the case of authors who interpret the general genetic law of cultural development in terms of a transition from other-regulation to self-regulation, the formulation of reciprocal teaching rests on, or at least is quite consistent with, a modelling interpretation of Vygotsky's claims. In both cases the assumption is that functioning evolves on the intramental plane through a process of taking over a set of strategically organized directives originally used by a tutor.

At first glance this may appear to amount to a reduction of social to individual processes, something that clearly goes against Vygotsky's claims about the analytic and genetic priority of social practices. However, it is important to keep in mind that the modelling involved is of a very specific sort; it specifically involves *participation in dialogic interaction*. Most studies on this topic have assumed that this active participation in dialogue is a prerequisite for the transition to the intramental plane to occur. They do *not* assume that a viable alternative would be to model or train tutees in isolation from such dialogue. Thus, in reciprocal teaching it appears that a crucial ingredient is the actual experience of engaging in dialogue with others.

Such an approach contrasts with others such as Meichenbaum's (1977) which focus on training and modelling directives for tutees. Such training efforts assume that the directives can be learned in relative isolation from the kind of dialogic social interaction envisioned by Palinscar and Brown. The basic formulation is one in which the training is viewed as focusing directly on intramental functioning without the need to ground it in an intermental plane of action. Thus the focus of Meichenbaum's self-instruction training has been to provide subjects with a model who demonstrates the self-instruction verbalizations while performing a task. The subjects are then asked to imitate the behavior of the model while performing the same task.

The modelling interpretation of Vygotsky represents a second interpretation of how social interaction is related

to individual mental functioning. As in the case of the Piagetian account, we would argue that the point is not to assess it simply in terms of whether it is correct or incorrect. Instead, it should be understood as a perspective that can provide important insights into how at least certain forms of intermental functioning can give rise to individual psychological processes. Of particular importance in this respect is the fact that it seems to provide insights into interaction where there is a clearly defined expert and a clearly defined novice. Its pragmatic value in generating research findings and practical implications is beyond dispute in our view as studies by investigators such as Palinscar and Brown (1984) and Rogoff (1990) have demonstrated. One of its weaknesses is that it tends to view the tutee as inherently passive. Rogoff's apt term "*guided participation*" is motivated by a desire to emphasize the tutee's active engagement in intermental functioning, but the tendency to view the process involved in terms of modelling means that the tutee often continues to be viewed as a passive recipient.

### A Text Mediation View of Vygotsky

A second interpretation of Vygotsky's ideas is what we shall term the "text mediational view." It rests heavily on the assumptions that: a) intermental and intramental functioning is fundamentally shaped by mediational means such as forms of language (Wertsch, 1985, 1991); and b) all participants in intermental functioning are actively engaged in shaping this functioning.

The claims we shall outline in connection with the text mediational view of Vygotsky are grounded heavily in the writings of the Soviet semiotician Lotman (1988a, 1988b). Lotman argues that two functions are characteristic of all "texts." The "functional dualism" he envisions involves what we shall term a "univocal" function on the one hand and a "dialogic" function on the other. The univocal function focuses on how it is possible "to convey meanings adequately" (1988b, p. 34), and the dialogic function is concerned with how it is possible "to generate new meanings" (1988b, p. 34).

The first function is fulfilled best when the codes of the speaker and the listener most completely coincide and, consequently, when the text has the maximum, degree of univocality. The ideal boundary mechanism for such an operation would be an artificial language...Since it is this aspect of a text that is most easily modeled with the means at our disposal, this aspect of text has been the most noticed. It has become an object of study, and at times has been identified with a text as such, obfuscating the other aspects (1988b, pp. 34-35).

The kind of single-minded focus on this function noted by Lotman is similar to what Reddy (1979) was criticizing in his account of the "conduit metaphor" of communication. In Reddy's view this powerful, but misleading metaphor underlies many contemporary theories of communication with their emphasis on "encoding," "transmission," "decoding," and so forth.

In contrast to this first, transmission-like function of a text—a function which "requires maximal semiotic ordering and structural uniformity of the media used in the process of reception and transmission" (Lotman, 1988b, p. 41), the second function of text is grounded in the kind of multivoicedness, or dialogicality that concerned one of Lotman's intellectual mentors, M. M. Bakhtin (1981, 1984; Wertsch, 1991. According to Lotman:

The second function of text is to generate new meanings. In this respect a text ceases to be a passive link in conveying some constant information between input (sender) and output (receiver). Whereas in the first case a difference between the message at the input and that at the output of an information circuit can occur only as a result of a defect in the communications channel, and is to be attributed to the technical imperfections of this system, in the second case such a difference is the very essence of a text's function as a "thinking device." What from the first standpoint is a defect, from the second is a norm, and vice versa (1988b, pp. 36-37).

In Lotman's view virtually *any* text is characterized by *both* the univocal and the dialogic function. However, the degree to which one or the other dominates may vary widely. Among other things, then, his account of functional dualism implies that when a text is serving a dialogic function, it cannot be adequately understood in terms of the transmission model of communication. This is so because a transmission model presupposes that a single, univocal message is transmitted from sender to receiver, whereas Lotman and Bakhtin view the process as involving multiple voices from the outset. As Wertsch (in press) has noted, Bakhtin argued that the very process of understanding, or comprehension is one in which the active listener "strives to match the speaker's word with a *counter word*" (Volosinov, 1973, p. 102).

The insights of Lotman and Bakhtin suggest that the dominant tendency to focus on the univocal function of text makes it very difficult to see some of the essential mechanisms whereby semiotically mediated social interaction transpires. In their view it is essential to appreciate the dynamics associated with the dialogic function as well. For our purposes, a further implication of the exclu-

sive focus on the univocal function will be that the failure to take into account the dialogic function of text makes it difficult to understand the processes whereby the transition from intermental to intramental functioning occurs.

Taking the dialogic function of text into account means that spoken utterances, written utterances, and other forms of text are viewed in terms of their capacity to be thinking devices or objects to which one can respond. This function is distinct from, and complements the function of texts to serve as containers of information transmitted from sender to receiver. In Lotman's words

...in its second function a text is not a passive receptacle, or bearer of some content placed in it from without, but a generator. The essence of the process of generation, however, is not only an evolution but also, to a considerable extent, an interaction between structures. Their interaction in the closed world of text becomes an active cultural factor as a working semiotic system. A text of this type is always richer than any particular language and cannot be put together automatically from it. A text is a semiotic space in which languages interact, interfere, and organize themselves hierarchically (1988b, p. 37).

The general point of Lotman's account of functional dualism is *not* that communication is best understood in terms of either of a univocal or dialogic model in isolation. Instead, virtually every text is viewed as involving an irreducible tension between these two poles. At the same time he views certain kinds of texts as being more heavily weighted on one or the other side of this tension. Certain texts are primarily univocal and transmission-like in their function with a reduced emphasis on the dialogical function, and others have the opposite set of characteristics.

Lotman's account of the functional dualism of text has major implications for a Vygotskian account of the transition from intermental to intramental functioning. Specifically, it can help distinguish between interpretations that presuppose a predominantly univocal or a predominantly dialogic function of text. Is the communication in intramental functioning viewed in terms of the transmission of information, or is it viewed in terms of texts that can serve as thinking devices (i.e., as texts with which one is to come into dialogic contact by questioning, rejecting, appropriating, and so forth)? The two orientations toward communication have profound implications for what one is likely to see going on in social interaction and having an impact on intramental functioning.

The kind of contrast we envision here can be seen in different modes of classroom discourse. Investigators such as Mehan (1979) have reported that a great deal of

classroom discourse occurs in the form of interaction consisting of: 1) teacher Initiation, 2) pupil Reply, and 3) teacher Evaluation. For example, this I-R-E sequence often revolves around "instructional questions" (i.e., questions to which the teacher knows the answer) as in:

**Teacher:** What is the capitol of the U. S., Jack?

**Pupil:** Washington, D.C.

**Teacher:** Good.

In such exchanges, the text comprised by each utterance functions primarily as a means to transmit information or a directive; it is not intended to serve as a thinking device capable of generating new meanings. Thus each utterance is treated as a kind of unalterable whole that is to be "received," "decoded," and responded to by transmitting some message in return.

In contrast to this heavy emphasis on producing univocal texts, some recent attempts at reshaping classroom discourse have been motivated by a desire to produce what Lotman would term dialogic texts. A fundamental indication of this tendency is that the utterances produced by the discourse participants are treated as starting points for conversation, as being capable of generating new meanings, as thinking devices. For example, the emphasis Tharp and Gallimore (1988) place on beginning reading discussions by building pupils' statements about experience outside the classroom reflects this tendency. Instead of viewing such statements as the transmission of correct or incorrect information (or ruling them out as irrelevant), the goal is to view them as capable of generating new meanings that can serve as a bridge between everyday experience and formal instruction.

Another example of a program with an emphasis on taking utterances as thinking devices can be found in the Hypothesis-Experiment-Instruction method of science instruction developed by Itakura (1986). In this case, debate among pupils and teams of pupils is fostered around a particular scientific problem. Specifically, it is fostered by asking pupils to make predictions about the anticipated outcome of an experiment and then to question those who make other predictions and defend their own predictions before the experiment is carried out. Investigators such as Hatano and Inagaki (in press) and Wertsch and Toma (1990) have noted the extremely active debate that transpires in this setting. Furthermore, Hatano and Inagaki have analyzed the interaction in terms of the "partisanship" that may emerge, Wertsch and Toma (1990) have noted pupils' tendency to invoke others' stated ideas (i.e., to use others' utterances as thinking devices) in

formulating their own utterances.

In many respects the text mediation interpretation of Vygotsky's ideas about the transition from intermental to intramental functioning might be viewed as quite similar to what Piaget had in mind when talking about the conflict or discrepancy among perspectives generated by social interaction. And indeed there are important affinities. The kind of conflict or discrepancy envisioned by Piaget has much in common with the "interaction between structures" or the "semiotic space in which languages interact, interfere, and organize themselves hierarchically" (1988b, p. 37) noted by Lotman. For Piaget, this interaction between structures is viewed as occurring primarily on what we are calling the intramental plane, whereas for authors such as Tharp and Gallimore, Hatano and Inagaki, and Wertsch and Toma, the focus is on intermental functioning. However, these latter authors would all agree that such intermental functioning is tied to intramental functioning. Differences still may remain on the precise nature of the relationship between these two planes of functioning, but this does not contradict the affinity between Lotman and Piaget at a more general level.

Where major differences do appear, however, is in the nature of the texts that mediate social and individual performance. In the Vygotskian perspective we have been discussing, the notion of mediation is central. Indeed, Vygotsky's notion of mediation provides the key to understanding how his approach differs from many others (Wertsch, 1985; 1991). The centrality of this notion is reflected in the fact that for Vygotsky human agency is not a property of individuals or of groups of individuals alone. Instead, it always involves mediational means as well, a point expressed in the equation of agency with "individual(s)-operating-with-mediational-means," or "mediated agency" for short.

Furthermore, the forms of mediation (e.g., discourse forms, pictures and graphs) used by humans to carry out conversation, group and individual problem solving, and so forth are fundamentally shaped by the sociocultural setting in which activities are carried out. Building on Bakhtin's (1984) notion of "ventriloquism," Wertsch (1991) has argued that this does not mean that individuals are reduced to being conduits for mediational means. However, it does mean that they are not completely free to appropriate any mediational means imaginable.

Thus the mediational means that shape intermental and intramental functioning are usually not invented *de novo* by the individuals using them. Instead, they are

provided largely by the cultural, historical, and institutional settings in which these individuals exist. As a result we are empowered as well as constrained in specific ways by the mediational means of a sociocultural setting.

This point is reflected in the research of investigators such as Hatano and Inagaki (in press). The nature of social interaction and thinking in the Hypothesis-Experiment-Instruction method is fundamentally shaped by the mediational means employed in the science classroom, and what is employed is determined in large measure by what is allowed and encouraged in that setting. Investigators such as Gee (1988), Michaels (1981), and Wertsch and Minick (1990) have argued in general that the forms of discourse employed in classrooms are subject to all kinds of constraints that have little to do with the cognitive tasks at hand or may even inhibit functioning on these tasks. For example, Gee and Michaels have argued that middle class American ideology about proper forms of language and argumentation is often a critical factor in determining whether an utterance is acceptable or not, and Wertsch and Minick have argued that one of the major criteria that defines appropriate classroom discourse is a unique set of boundaries which define topics. Such studies point to ways in which classroom discourse is constrained in fundamental ways and hence is quite distinct from that found in other sociocultural settings.

Thus, the point here is that the text mediational view of Vygotsky's approach differs from the Piagetian approach we outlined earlier in what it sees as the nature of the texts employed. The tradition of Vygotsky, Bakhtin, and Lotman emphasizes the sociocultural origins and situatedness of texts used as mediational means, and this tradition views these mediational means as fundamental components of the agency involved in human activity. In contrast, the general notion of mediation is at least not emphasized in Piagetian approaches, and it certainly is not grounded in the notion of sociocultural situatedness.

## Conclusion

Where does this leave us? We believe that the most important conclusion is that the three views we have outlined of the social origins of individual mental functioning differ in fundamental ways in what they view as social interaction, what they view as individual functioning, and how they view the relationship between these two forms of functioning.

In some cases, these differences derive from subtle, yet essential discrepancies in assumptions about the analytic priority given to individual or social processes. The

notion of priority is crucial here because the issue is not simply one of whether or not social processes are included in the account; it is an issue of the role they play in an analytic strategy. Thus the question is whether an account of individual processes is viewed as providing the starting point from which social processes can be understood or vice versa. As outlined earlier, we view most Piagetian strategies as following the first path, and we view Vygotsky as following the second.

As we have noted, however, this does not mean that there is a single interpretation of Vygotsky's claims about the social origins of individual mental processes. Just as Piaget's writings have spawned a variety of interpretations, there are at least two interpretations that can be given to Vygotsky's ideas about the social origins of individual mental functioning. We have labelled these the "modelling interpretation" and the "text mediational interpretation." In our view, both of these interpretations accord priority to intermental processes, but they differ in the attention they give to mediational means and to sociocultural situatedness.

As we noted at the beginning of our chapter, many of the differences we have outlined arise because various authors have focused on different types of social or individual functioning. For example, one perspective may be quite useful when dealing with adult-child interaction but less relevant when trying to explicate child-child interaction. In the end, this means that in many instances the perspectives do not reflect different interpretations of the same basic phenomenon, but pieces of a more comprehensive approach which we have yet to develop.

## Notes

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<sup>2</sup>Following the practice of Minick in the translation of Vygotsky (1987), we shall use the terms "intermental" and "intramental" rather than "interpsychological" and "intrapyschological," respectively. The latter terms have been used in earlier translations, but are less consistent with other aspects of the English translations of Vygotsky's terminology.

<sup>3</sup>As used by Soviet scholars such as Lotman, a text is any semiotic corpus that has significance. It may be verbal (e.g., a single utterance, a book length treatise) or nonverbal (e.g., a painting, a costume). Our focus will be on verbal texts, especially ones that are spoken in the flow of intermental functioning.

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## Oral Tradition, Visual Media, and Information Transfer in an African Development Experiment

Brian Coyle

*A study was made applying psychological and anthropological theory to the extension program of a West African agricultural development project. The hypothesis was that in a preliterate culture with a strong oral tradition, an oral narrative structure would be more popular and efficient than graphic imagery. "Mnemonic narratives," short stories allegorically coding technical information, were compared to picture flannel graphs in nine farmer meetings carried out by three different extension workers. A variety of responses were encountered, the most significant being the unexpected effectiveness of imagery. Visual and oral material had different strengths, and it is proposed that innovative low-tech combinations of the two require further examination.*

In this research we moved beyond orthodox approaches to using folklore in development communication (Rogers & Adhikarya, 1978). In treating folklore as a traditional artifact, we both under and overemphasize it. It is either artistically fragile and unreachably authentic, or an inconsequential throwback to prescientific mentality. Within many contemporary rural African contexts folklore is not an artifact but is still alive, manipulated and reshaped for different purposes (Barber, 1987), and it can be used for applied agricultural communications (Kerr, 1981).

In fact it is useful to replace the folk-urban continuum implicit in the orthodox view of folklore with a more anthropologically sophisticated concept, the oral-literate continuum (Goody, 1977). This enables us to more precisely identify the function of communication in western and indigenous scientific knowledge. By removing discourse from its ordinary contexts, communication forms are adapted to the specific needs of a scientific endeavor. It has been suggested that oral tradition serves as a decontextualizing process in Africa (Akinraso, 1981).

This report is primarily an account of the way in which stories generated following ethnographic evidence  
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concerning Mende oral tradition (Cosentino, 1982) were "processed" by farmers in a southern, Mende ethnic area of Sierra Leone, West Africa. Many ideas about communication in West Africa have centered on the study of oral tradition (Doob, 1961). Early in the study of African culture, oral tales achieved prominence among indigenous arts. A large body of high quality, detailed analysis about African stories is available in the literature.

Psychological literature demonstrates the interaction of narrative, memory, and conceptualization (Bartlett, 1967). Extensive stimulus-response testing of memory association theories has suggested the role of narratives in establishing retention among West Africans. (Cole, Gay, Glick, & Sharp, 1971). An operational example of narrative and memory thus could be expected to improve our understanding of communication and memory processes. Of course these interactions are much more difficult to monitor and measure in the field, and certainly more difficult to control, because of the difficulty in informally approaching villages and the extreme complexity of the social environment in which research-farmer contact occurs.

Scientific studies in the behavioral sciences, involving description and qualitative analysis, can perhaps most reasonably be expected to refine the definition of a problem. In the case of this research, a set of ideas, culled from psychology, anthropology, and other sciences, were merged into a working hypothesis that had apparently testable consequences. Rarely in the behavioral sciences do real-world experiments completely falsify the hypothesis; instead we can expect that the test results will lead to a modified, more general hypothesis. It should be observed that the byproducts of this research were strategically functional. Developing stories for a development agency supplied them novel and potentially useful information delivery assistance. To carry out real-world "development assistance" research effectively, one must integrate the needs and capacities of a development agency with the requirements of research.<sup>1</sup>

The term "mnemonic narratives" identifies the kind of stories developed to fit both the psychological and anthropological needs of the study. In studies of narrative form, these stories are closely similar to allegories; in the realm of oral narrative, they are indebted to Scheub's concept that oral tale-tellers use imagery as mnemonic short cuts (Scheub, 1975). In the stories developed as prototypes of a "mnemonic narrative" form, a number of components were meant as memory cues. By this is meant that a listener is intended to better retain heard information

if he or she was presented the information by way of, and is able to link it to, a salient emotive metaphor. Evidence for this hypothesis rests in the mental strategies of mnemonists, who use emotive words or images as cues to remember information (Luria, 1968).

The first purpose of this report is to present experiments which cast doubt on this basic assumption, because they showed that in a markedly "oral traditional" culture, where there are few visual cultural elements and a high rate of illiteracy, ordinary and cooperative individuals showed only fair rates of story recall. In accounting for the failure of a majority of African villagers to successfully remember these stories, attention must be given to contextual factors. Whenever possible, the verification of basic scientific hypothesis should defer to relevant external factors. Failure to do so is a cause of much current reassessment in anthropological and folklore studies. The necessity of creating stories in English that were then translated into the local language in addition to the out-of-place role of stories in the mouths of extension workers is a potential source of considerable contextual "noise."

More importantly, perhaps, is that I failed to invoke certain elementary necessities of "oral tradition." The traditional story-telling *process* is participatory and mutualistic. It is delicate, like fishing: a little tension, release, a nibble, two reels, some slack, back to tension again. Maybe extension workers were used to a more threatening, persuasive rhetoric<sup>2</sup> (which they may employ rationally considering their own threatened job situation). Further, I think our underlying mnemonic principles were not seen as a traditional *way of thinking* by many people. Mende listeners respond to narrative symbolism as a kind of natural wonder, the way psychologists view dreams. Narrative events should have begun by establishing terms of reference: allegories are not meant to hide or disguise something, rather they are trying to get beyond words, to reveal, not conceal.

## Methods

In trying to assess the impact of orally presented narratives in a culture with a strong oral tradition, a testing mechanism was needed. Since human systems of communication, like oral or visual expression, can be studied fairly discretely and unambiguously, our research design exploited this, and compared the discrete results of oral presentations with the discrete results of visual presentation, a comparative methodology. Broadly speaking, flannel graph visual aids, considered one of the best development extension media tools, were compared to the "mne-

monic narratives." The hypothesis was that in a culture (such as Mende) with a strong oral tradition, oral narrative media aids would prove as or more effective than a visual aid, although the latter is a recommended development communication practice.

The goal was to emphasize either the visual or oral sense by presenting the visual or oral media aids as supplements to a basic extension message. Three extension workers participated. Essentially similar basic presentations were made by each extension worker to three different villages. Following the basic presentation additional "mnemonic narratives" were presented orally to one village; in another village visual material was given in the form of flannel graphs; in the third village no supplement was given. Thus each of the three narrative villages and each of the three visual and control villages were visited by different extension workers. Follow-up investigation by the author in all nine villages attempted to determine any differences in farmers' recall and attitudes towards the different presentations.

For an adequate test of these methods detailed sets of data were required, including village size, social make-up, and previous extension exposure. Villages ranged in size from about 100 to 300 inhabitants, slightly above average compared to other local communities. They were not separated by distances substantial enough to preclude any communication between them, however our data collection occurred within the benign context of extension review. Because of this, the exact degree of village isolation was not important. We were unable to avoid certain distortions typical of development extension outreach. Prominent farmers and the chief were usually present, and important male respondents were usually interviewed first. In trying to atypically isolate extension exposure to a subgroup of villagers such as farmers outside the village power hierarchy we would in fact have been testing the targeting of extension, not media tools.

Participating extension workers were requested to identify, contact and arrange meetings with villages that had not received previous extension exposure. This proved impossible, again within the context of routine social interaction. For an extension worker to arrange a meeting with an "untouched" village was a major event whose implications outweighed the introduction of a media aid. Interactions between villagers and representatives of the outside world, occurring in the traditional village environment, are difficult to monitor and measure, and are very difficult to "control." It is not the purpose of this paper to examine the special conditions immediately surrounding

the interaction of villager and extension worker, but the potential effect of these conditions on their interaction cannot be overestimated.

In the "mnemonic narrative" presentations the effect of oral expression was studied. Farmers' abilities to recall the extension worker visit, the content of the visit, his or her attitude towards the visit and only lastly the recall of and attitude towards the narratives were investigated. Villagers were informed by the extension workers that their visits proceeded by two weeks the visit of a foreign researcher, but they were not aware of the subject of the research at least until they had finished the interviews. In previous work, it was noted that news of the researcher's questions was capable of spreading through the village faster than the researcher himself. For this reason, the essential communication aspects being investigated were only a small part of the farmer-researcher conversation. In effort to bring out subtleties in a person's response to the extension message, each interview was allowed to progress open-endedly, while simultaneously a checklist was kept of basic subject matter areas that had to be asked for.

The investigation of the impact of visual extension media allowed an equally discrete investigation to be made of farmers' responses. The visual material was studied by two methods: asking farmers to recall the visual aids and asking them to identify visual material correctly, as well as open-ended questions. Again the communication questions were buried in a conversation about the general topic the extension worker presented. It should be noted that in villages exposed to either oral or visual media, if a farmer's conversation failed to naturally evolve to a point where a story or picture could be referred to, the interview would be completed without addressing the topic.

"Mnemonic narrative" extension aid material was developed by the author with the assistance of the Dandabu Functional Adult Literacy Program, including vernacular Mende translation. All extension agents and farmers included in the experiments were native Mende speakers. The visual aids were in the form of flannel board posters. All pictures were pretested to insure comprehensibility. Material was culled from extension material prepared by the International Rice Research Institute, by the audio-visual department of the participant development agency and redrawn by a professional artist.

Before examining in detail the impact of oral and visual extension material, it is important to demonstrate that the content of the extension messages was appropri-

ate for the region and that the messages themselves were capable of being used by the extension workers. The first issue can be gauged from the fact that a vast majority of farmers questioned insisted that extension workers and their message were a useful, even obligatory aspect in the process of agricultural development. Published reports accounting the nil or negative potential impact of extension in the development of small-scale agriculture are of limited value in the case of the extension message offered in this program. The potential negative impact of development on small farmers relates to the unequal ability of economically peripheral, disenfranchised, or dependent groups to capture development rewards. In the case of this program the innovation being offered may only minimally interfere with household management; it can not usurp any aspect of it. This is crucial because it is the substantial magnitude of (in terms of cash flow) extremely modest household transformations that present impenetrable barriers to innovation adaption. Certainly it is not possible to define the precise impact of an innovation when we are carrying out short term research. But whereas innovations that involve input purchases or cash enumeration could be expected to have dramatic social consequences, the lessons being offered by extension workers in this case offered a way of reducing reliance or dependency on inputs and could even be implemented outside of the ordinary male-dominated village hierarchy.

As to whether the media aids were capable of being used by the extension workers, a number of factors should be considered. The director of the agricultural sector which provided the extension infrastructure for my research said the bottleneck to effective implementation of flannel board visual aids was that extension workers could not be trained in their use. Training of extension workers in the flannel board poster presentation necessary for this research took place in intensive individual sessions, with repeated testing of the extension worker's handling of the material. Ultimately, the workers had enough confidence to become relaxed in their presentations, able to move fluidly through presentations without miscues. The training was sufficient to avoid a major pitfall in flannel graph use by extension workers, wherein a key element is improperly displayed and the message's meaning not merely clouded, but mutated into a statement of error. Practice and trainer-extension worker dialogue were sufficient to overcome these problems. It should be noted that I was working with extension workers above average in intelligence and motivation.

Extension worker's abilities to handle oral presentation of the narratives is less clear. Elsewhere I will elabo-

rate, but though the extension workers could easily read the tales, whether they could easily present and process them with a group of farmers is difficult to say. They are Mende, I am not, and perhaps mistakenly I believed it was inappropriate to train them in how to tell a story.

Because the presence of a foreigner could upset the concentration and distort the sympathies of a farmers' meeting, I only accompanied each extension worker once. These visits were so arranged that I witnessed a control village with one extension worker, a flannel graph presentation with another extension worker, and a "story" village with the third. In all three villages the extension workers did their jobs well. By good fortune, the extension worker I saw performing the "mnemonic narratives" was literate in Mende and had memorized the material, and put on a good show. Unfortunately, my late arrival had delayed the meeting so that villagers were impatient, perhaps canceling his extra effort.

### Materials

Our biggest constraint in preparing media was neither aesthetic, conceptual, or material. It was, as we had been warned, in finding a way to effectively use extension workers to present the media. The stories proved awkward. First, it was unrealistic to expect an extension worker to be literate. Paradoxically, it was perhaps unlucky that our three extension workers were literate. Instead of being forced to find an effective way of having them memorize aurally the stories, which not only would have been profitable as a training exercise, but possibly might have highlighted techniques that could have been incorporated in the story-telling process itself, we printed books with simultaneous English and Mende translations displayed in an easy-to-read pattern (see Figure 1.) Two of the extension workers were unfamiliar with Mende orthography, so a paraprofessional Mende linguist gave them a brief introductory course. The two extension workers said it was less work just to first familiarize themselves with the story and then refer to the English version during presentation.

In so far as developing "mnemonic narratives," our goal was to create kinds of allegories (which had been a popular educational oral mode in largely preliterate medieval culture). The modern use of the term allegory, which tends to encompass a whole range of Freudian, Jungian, or archetypal meaning, is not our use at all. Rather we use the medieval definition, when allegory meant, bluntly, an expression "that says one thing, and another is understood" (Allen, 1971). There is a lack of

Now the cutting grass stands up and says "I will not let you pass. I'm so very hungry, and I can smell your bonga. Give me some."

Ke seiwoi ji hiyenga i loo ye  
"ngce luma ba lee. Ndolci waa  
lo nya ma ma. Tao nyaa nyc  
maguu meima bi yeya. Nya go  
kulo."

She opens her basket and gives him a pile.

Ke i ngi hakeri hulawonga i huei na  
go kulo

"Thank you kind lady. I will repay you for your kindness, even though I am an enemy of man."

A very rich chief was heard to sing: "Oh Njasawai, you are the woman that I dream of."

Maha gbatengoyilo yelo waa  
a ngole yaa ye "oo njasawai,  
nga kibawolo a bie watii gbi."

Njasawai was a mysterious woman who always wore a yellow lappa, a color no one else could find.

Nyapoi ji wieni waa a kabande  
nyaha lo watii a kula bajingo  
nyandengoi yililo, na numu weka  
gbi ee gua ngeya, ngiliua.

The blacksmith overhears the chief singing his song.

Ngaiiblaa lo pelee ta mahei ji  
wameri lo a ngi wulei ji yaa.

Ke huci ji ndea ngi ma ye "Nyapoi  
bi sie ka ye nga bi pawalo kpekpeyi  
ji va bi pienga nya a nge kia be nya  
nuyungaa ti juwumia a nge."

The sky is getting bright, and the girl finds her way easily.

Nge wohn hitiilo ke nyapoi ji  
totoonga a ngi gulo lola, lwa fulofulo.

Finally, tired and hungry, she reaches her village.

I foilo naa ngi yefulahu ngi gaahu  
gbayongo waa tao ndolci ngi ma

People are getting out of prayer.

a ngee wohui na ji lee nungaa ti  
ye gbuama selimci

The blacksmith is envious and has a daughter he wants to marry to the chief. Her name is Wuse.

Ngaimoi ji yelo a tolo gbuu yee  
hindei ji va ke tabee i magaanga  
koo i ngi lo nyahalui wuse ve  
mahei ji we sohu.

The blacksmith takes his pipe and special tobacco and goes to the villoge tree, which is filled with weaver birds.

Ngaiwoi ji ngi laove gutui wumhui  
lo i ngi lawei wu hu ke i ya ngulu  
waa na hu to hei na a kpoi. Teave  
lulu ji yelo a mbakungei nasia ti ye  
ngulii na hu

Fig. 1

intellectual speculation in this kind of allegory that makes it seem pedantic, boorish, and earthy to modern ears. Perhaps in a preliterate rural quasi-peasant culture of West Africa, these aspects might prove appropriate rather than burdensome.

The story "Njasawai and Wuse," which was presented to two of the three villages and was the clearest example of straightforward allegory, was an attempt at narrative, mnemonic expression of a problem and solution in rice identification. It expresses the difficulty one has in separately identifying two rice varieties whose seed coats look alike. Extensive interviews with farmers had shown this to be a major factor in slowing the execution of careful rice harvesting. Further, a number of farmers had described common solutions. Since the rice plant is gripped below the flag leaf during panicle harvesting, shape, size, and the feel of the leaf can be used for identification. Some, but not all harvesters, were aware of this.

The story of "Njasawai and Wuse" begins with a chief singing that he loves Njasawai, a woman identified by her remarkably yellow "lappa" skirt. A jealous blacksmith disguises his daughter in the same outfit. On the day of the chief's wedding to Njasawai, both women appear. The chief is clever; he instructs them both to bring cutlasses. He then tells them to strike him on the neck, though everyone knows a fatal blow is a capital crime. Njasawai's blade is broad, flat, and dull, however, and does him little harm. Wuse, daughter of the blacksmith, has a long sharp blade, and she reveals her true identity rather than suffer punishment.

All of what passes in this story is plain symbolism. Any elucidation necessary is simple enough to be supplied by the extension worker: the difference between Njasawai and Wuse, two names of rice varieties with the same yellow colored seed coat, is in the shape and feel of their leaf blades.

Two other "mnemonic narratives" provide further examples. One concerned a woman who is abused by her husband because his village is more progressive than hers. The woman flees one night, and on the way home encounters two animal species: army ants and the "cutting grass" rodent all too common in the area. Her kindness to these terrible creatures is repaid when she arrives at her village at harvesting time. There she discovers that people will not be practicing the rice harvesting technique being extended, and she calls on the ants and "cutting grass." What each does typifies methods of rapidly carrying out selective harvesting. The rodent, notorious for eating the stalks

of the best rice plants, is able to rapidly select healthy rice by the feel of the stem. (This was a technique used by a number of farmer's interviewed.) The ants are able to quickly segregate varieties, by coordinating their actions effectively.

Again, nothing requires extensive elucidation. The actions of the characters are self-explanatory. The ideas expressed are based on best indigenous practices. The situation of the woman is common. Yet it is clear that this is an allegorical story, with certain ideas—selection of rice by stalk size and flexibility, and coordinating organization of harvesting—transformed into animal characteristics. Even more obviously allegorical, though more challenging, was a story of a boy sent to buy rice to eat. He instead is persuaded by an old man to purchase a single seed rice grain from a giant rice plant. The boy's mother declares he shall starve for his misbehavior, and flings away the single seed. As the seed grows tremendously, the boy complains to the old man of his hunger. The old man tells him: the skinnier you get the larger the rice plant will become. This story differs from the others in that the allegory raises difficult questions. It asks the listeners to select an ending—should the boy sacrifice himself for a giant rice harvest, or sacrifice the harvest to go on living. It is a more fantastic story than the others, attempting to convey what participant observation had revealed as crucial pressures in seed rice harvesting and storage. First, improved varieties are sometimes seen as a wasteful extravagance to purchase. Second, during the rice cycle, eating the rice that is meant for seed satisfies hunger but undermines the next harvest. Finally, the end of the story proposes that whatever path chosen, proper selective harvesting will help one recover from difficulties.

Equal attention was devoted to developing graphic material. Here we had the resources of the International Rice Research Institute and German Agency for Technical Cooperation's (GTZ) local audio-visual department to draw on. Concepts in agriculture—shifting cultivation or otherwise—tend to be fairly complex in that they involve combining a balance of ecological inputs and outputs with some degree of applied technical manipulation. Unlike graphics about health, which revolve around that well-known item, the human body, agriculture has a double problem. Its objects of interest—plants—are not as morphologically distinctive (an outline of leaves, stems, and seeds can represent many plant species) or as demonstrative as a human. Secondly, farming practices tend to be best explained by being viewed in different spatial dimensions simultaneously (to perceive an activity like plowing or harvesting, one must combine a macroscopic view of a

whole field with elemental images of plant and tool.) Our challenge, then, was to concisely exhibit the basic framework of "panicle selection" in a series of drawings, given these drawbacks.

The first step was to clearly identify the problem "panicle selection" addressed: multiple rice varieties should not be harvested together and only the most vigorous and healthy panicles of each rice plant should be harvested for seed. Using the IRRI material we found a certain sized image of a rice plant that people could easily identify as such. The Bo-Pujehun RDP audio-visual department had a collection of drawings of farmers in different poses. In an earlier, aborted attempt to create a "panicle selection" flannel graph, the audio-visual team had orchestrated a training session where extension workers drew farmers in various states. With pre-testing it turned out that a couple of these drawings were especially appealing. Having an artist redraw everything to scale with a "friendly" look, eight images were made that could be recombined in different sets to display a range of meanings. An example of such a combinatorial series is presented in Figure 2. We established visual motifs for successful and unsuccessful harvests ("happy" and "sad" farmer). An image of a "harvester" combines with a picture of a rice plant with clearly demarcated "healthy" and "not so healthy" panicles. The "harvester" passes, and we see a picture of what he has left behind: in this case only empty stalks. A successful example of "panicle selection?" Not according to the extension worker, who places a picture of a "sad" farmer on the graph.

This visual game is replayed with different rice varieties or with only the less healthy panicles left after the "harvester" has passed, each time reassembled with a respective "happy" or "sad" farmer outcome. Audience participation is required, and the important aspects of "panicle selection" are illustrated.

After pre-testing the stories and the flannel graph, their packaging was prepared. The stories were printed in little notebooks; the flannel graph was assembled in a fold out envelope that opened to instructions, similar to those shown in Figure 2. Each extension worker received both media packages.

## Results

We have thus presented to different groups of farmers two forms of media-coded information which, despite being unrelated in form, mirror each other in content. We are told by anthropologists and folklorists that West African ethnic groups are oral cultures, that stories,

songs, riddles, and debates are more commonly employed than paintings, sculptures, drawings and carvings for expression and communication. Social communication flows appear to occur more often by the route of oral codes. So in particular, I want to discuss problems in farmers' responses to oral narratives, and to make a distinction between the inability to remember the story event and the distorted recall of a story. This distinction is important, because whereas distorted story recall is usually considered to be a factor of the passage of time, total inability to remember suggests the story failed to stimulate any memorable interest.

Let me establish some definitions. For a "correct" recall a person remembers the essential plot and characters of a story. "Distorted" recall is when a respondent fails to correctly restate the essential plot of a story. That is, distorted recall in this definition is a function of not remembering the beginning, middle, and end of a story. Thus a person remembers the story presentation event occurring, and we shall permit flaws in a "correct" recall to the extent that they do not change the basic outline of a story. Inability to remember a story at all, though the person was present at the story telling session, is called story "amnesia."

In Table 1 we observe the total incidence of correct recall, distorted recall, and amnesia among the 38 farmers interviewed in villages exposed to "mnemonic narratives." Fourteen of these farmers had to be excluded from the table because they either did not attend the original meeting, did not have the time or desire to discuss the story events, or could not be tactfully steered towards the necessary questions.

In many cases the isolation of media aids' effects to a primary sense dimension (oral or visual) were not unambiguous. In some cases extension workers found it irresistible not to use flannel board pictures along with story telling, though this resulted in some of the most interesting farmer conversations. In the case of these two villages, which were intended for oral presentations but which also saw some pictures, we have to adjust our analysis of communication impact.

How do we understand this appeal of pictures to extension workers, such that they were used even when not supposed to? Here we can note that the two of three extension workers who included pictures were the two unable to read their native tongue effectively, and so had to read and translate the narrative text spontaneously from English (it is not unusual for literate Mende people to read only English, the language taught in schools). The pictures



We call this picture unhappy farmer. Why do you think he is unhappy?



Do you remember this plant?



What are some reasons that a farmer may not practice panicle selection?



What has the harvester done?



Why is he unhappy? Does this have anything to do with the seed he used?

Fig. 2

were too effective, in the two extension workers' perspectives, to allowably remain unused during a presentation to skeptical villagers who wanted something tangible in return for spending their time at a meeting.

At the first "oral narrative" village (Gbamata) follow-up, night fell and we began our tour of villagers, approaching an older woman cooking. Mamie Brima told us her method of obtaining seed rice, which follows extension principles up to a point, but deviates at storage techniques. Questioned about the meeting she attended, she tells us bluntly that "pictures are abundantly better than stories." Since we had expected to query a group of farmers who had received only stories, we decided to re-focus our questions. After Mamie Brima's comparison, which seemed to tie up our research before it had started, we were concerned we would distort information if we asked primarily about story recall. Our first communication-related question to another woman was therefore about pictures. She proceeded to relate a story the pictures had told, a story that was a distorted version of one of the "mnemonic narratives," rather than the series of pictures! We continued to ask about pictures as well as stories, because with our hypothesis under question, we could expect to be biased against pictures. The next woman, again interviewed by her hearth, was asked if the extension worker should take pictures with him to his next village. Her response: "what sounds best is to [present] a story first then at the time of discussing what was learned in it then use the pictures to enrich it." Six interviews into our first "oral narrative" village and we already had the basic conditions for development communication media use explained to us.

**TABLE 1**  
Recall of "Mnemonic Narratives"

Correct recall	6
Distorted recall	8
Amnesia	12

Flannel graph recall can also be filtered through a tripartite division. While many farmers remembered there had been pictures at the meeting, it was less frequent that they could suggest to us they remembered details of the pictures themselves. Carrying around a couple of the flannel graph pictures, we could always test their recall through re-exposure. So our collected data shows farmers who could remember picture details, farmers who could identify pictures shown them, and a farmer who like his "story village" counterparts suffered "media amnesia."

**TABLE 2**  
Recall of Flannel Graph Images

Correct recall	13
Identified	18
Amnesia	1

Both statistically, and according to subjective impression, people remembered pictures more than they remembered stories.

We ask, then, if there was greater understanding or more appreciation for the message produced by visual images on a flannel graph. Or, conversely, did stories produce negative attitude changes? In *The Conditions of Learning*, Gagne specifies that components of an instructional environment must be rationally managed. Media use involves many factors:

Probably the most important consideration for the design of the learning environment, however, is not that several alternative ways of accomplishing the same function are usually available. Rather, the important thing is that for a given function, certain means of interacting with the learner are quite ineffective. Accordingly, the characteristics of various *media of instruction* in performing these functions need to be considered carefully in making a choice (Gagne, 1965).

To measure the functional gains from different extension worker presentations quantitatively, a range of attributes was isolated from the follow-up interviews with farmers. They include attitude towards the media presented, attitude towards "panicle selection," knowledge of "panicle selection," who the farmer learned this from, and what he or she recalls of the stories or pictures, if either was presented.

There are significant dissimilarities between each of the villages selected, not only in terms of differences in the way the meeting was arranged and carried out, but also in the social make-up, previous extension exposure, and the assumptions different villagers and extension workers had towards the activity.

This would tend to throw question on any subtle significances uncovered, but isolating out independent variables (such as attitude to "panicle selection") from the collected data reveals no solid statistical relationship to media exposure or type, in any case. From the limited ability an outsider has to quantify "attitudes" through verbal questioning in villages, neither stories nor pictures



appear to have an effect on the way Mende villagers felt or acted about "panicle selection."

As for the entire sample, unquestionably the most important determinant would be previous exposure to extension, especially if it concerned rice harvesting. This is confirmation of the dominant role played by extension in determining the diffusion of information, but as such does not suggest any utility for media.

Let us look at the interviews again, this time to assess some cases where the different media worked. Our first example, from Kowama village, is a woman who recalled a lot of story detail, understood panicle selection, and was enthusiastic about its importance. We had no difficulty establishing what her ordinary harvesting practices were (unlike many others who wished to present an image of being "master farmers"). What was surprising, given her previous low level of seed rice selectivity, was the extent to which she had grasped the implications of the extension worker's message. Other people who admitted to practicing non-selective harvesting were often unable or reluctant to clearly identify the meeting's purposes. Reaching her after having made a tour of the village, I thought that her knowledge might in part be due to the flannel graph pictures which the extension worker had improperly supplemented his talk with. However, she proceeded to recall one of the "mnemonic stories," in detailed, precise fashion, then stopped midway through as if at the end. When reviewing this example, it is apparent that the woman was unusual in having spent seven years of her life in the capital, Freetown. Was there something about urban contact which made her more susceptible to oral narratives? She was illiterate.

Soon after in the same village we interviewed an older farmer, a man who had lived in the village all his life. Again we took down an accounting of his traditional harvesting practices, then he explained the harvesting/storage techniques suggested by the extension worker, and then launched into a recapitulation of two stories the worker had told. It is obvious that the three week interval between story exposure and recall had compromised his memory, especially with the second story, in which cocoa replaced rice. His cocoa story made sense however. In it a village discovers its poor cocoa harvests are not due to soil infertility but to farming methods. Interestingly, this was a region with potential cocoa production underexploited by local people. It could easily be argued that the story had been reinvented by the farmer in a form more personally relevant than the original. Narratives, perhaps more than question and answer dialogue, contain, convey,

and represent experiential knowledge. Subconscious changes modifying a presented narrative that used local motifs allows a farmer to freely associate thoughts to express his version of a reality. Of course, the result is different than query responses; we do not end up with statistical insights into farmer behavior.

A third example is from another villager interviewed two weeks later. A month had passed between time of exposure and the follow-up, the woman had only heard the story once, and yet she recalled it in detail. She was the only person in any village to recall this story's animal characters' harvesting purposes. She claimed the story allowed her to remember the panicle selection information more easily. One wonders what her recall was like one week after exposure. We asked her why she could remember more of the story than other people. She said she listens well. We were satisfied with this response but perhaps it would have given us more results if we had examined her recall of other phenomena, allowing comparison.

Three farmers who bear little in common: a cosmopolitan woman, an older man, and a motivated girl. What is unusual about their interviews is that all three remembered narratives without any prompting, even against prompting that was going on for other details.

Much more frequently we found "visual aid" farmers who were able to converse about the pictures, without prompting per se, but more consciously than the "story" farmers above, and with simpler, more accurate recall. Besides these respondents, we also met a kind of recall unique to some "visual aid" farmers. An example is the village speaker of Gibina, a man with 15 children and three wives. He remembered few details of the extension worker's presentation, but as soon as he was shown one of the flannel pictures the seed selection concept came back to him. He was then enthusiastic. The ability of a picture to bring up information memory this way was often evident. One man actually said he had the picture in his mind's eye when he recalled details about panicle selection.

Interviews with villagers revealed two distinct kinds of underlying reactions to visual or oral media. These can be described as either "emotional" or "informational." Responses that revealed emotionally positive influences of a media show not necessarily as greater recall of information content, but rather are suggested by the enthusiasm of respondents to the meeting as it took place. One farmer in a "story" village, Kowama, grew excited during the interview, saying the information passed on by the extension worker during the meeting had been among the best advice he had learned in a long time. This farmer

made no attempt to otherwise ingratiate himself. Yet he denied remembering any stories. This high degree of enthusiasm was definitely more tangible in the media supplemented villages as compared to controls, regardless of the sometimes sugar-coated pronouncements farmers offered. Further, this "emotional" response was more evident in villages exposed to "mnemonic narratives" than to flannel graphs.

Although people can be excited about remembering a piece of information, "informational" responses are those where details are recalled concerning the media presentation. People were articulate about the innovation components, they could recall specific descriptions used, they seemed to have a grasp of the extension rhetoric. "Informational" responses occurred most often with the use of pictures.

A creditable reason for failing to accept these observations is that they lack controlled support. It would be my hope in future research to obtain that. The stumbling block to this kind of field research is how to possibly cope with the variation and ambiguity present among villagers. Part of the answer lies in the way questioning is carried out (using a female interpreter to interview women, which I only did in the one village where all respondents were women; these women, incidentally, had the highest rate of "story" recall) and part lies in accepting the researcher's approximation of the human interactions he participated in. I can state, for example, that most villagers seemed surprisingly favorable towards the extension message. But the reason for this lies partly in the potential implications of making a good impression on the researcher, who was often perceived as a gatekeeper for development aid. Despite careful disclaimers by my interpreters, the misrepresentation could rarely be adequately resolved to eliminate bias. This means unless I could verify a statement through observing evidence, which I tried to do in the case of seed management practice by visiting rice lofts, I was rarely able to unambiguously verify the truth of a statement.

## Discussion

In many Mende farmer's perspectives, and I confess in my own as well, there are two modes of human existence. Both are in developing countries, but they are most obviously stereotyped when juxtaposing the developed and less developed world. One is built substantially on previous human structures — physical and intellectual. The other is built firmly on, or in, the natural, not man-made world.

There are both of these modes in a developing country like Sierra Leone, and even in industrialized countries. But the "natural world" group are substantially the majority in Africa. And just as those of us in the developed world are aware that another form of living exists, so it works the other way as well, with consequent social psychological impacts. So it is difficult for some Mende not to see development as a road from one mode into another.

Development is only sensible when it recognizes the internal contradictions between the two ways of living, and, simply, accepts that substantial physical and intellectual human structures are as much the basis as the result of development. The flaw in the principle of appropriate technology, at least as the term is sometimes used, is the concept that tools, ethics, and ideas should be designed only to fit adaptations made to the "natural world." This fails to recognize that development is a communal activity; that community develops by building up its own mutual foundations, not just on the local environment. Development is a social contract, and as all social contracts it is intrinsically egotistical. Ideas like "appropriate technology," however highly self-conscious, are at heart averse to egotism.

The "mnemonic narrative" construct was rooted in the appropriate technology approach. The stories were tools that would "fit" into already existing local communication adaptations. Let us return to our analysis of the two modes of communication, picture and story. Our null hypothesis—that indigenous preliterate people appreciated the distinctive merits of a polished visual presentation more than the enhanced use of a local communication tool—received more support than our hypothesis. This does not mean trying to integrate tools (stories as extension aids) into the local situation (community meetings as vectors for oral communication) is wrong, only that "appropriate technology" should be a suggestion of a tool's situational relationship, not a rigid blueprint.

A picture is worth a thousand words. The tyranny of the image through the voyeuristic sensation that popularizes photojournalism, realistic art, or television, is as implacably evident in West Africa as anywhere. Here we catapult into an ethical realm, where commentators as disparate as Islamic fundamentalists, French philosophers, and feminist critics warn that the image is an "all-too-persuasive" phenomena. The image, in this view, undermines our ordinary sensibilities, tricks us into believing as reality a fabricated human invention. Is this the case with *flannel graphs*? Over a dozen farmers stated that one of the criteria for differentiating healthy from

unhealthy panicles was height, an incorrect fact unfortunately suggested by the rice drawings. But this could be the case with any form of information presentation—perfect knowledge is not what learning is about. The pictures were invoked by farmers themselves as being the evidence that convinced them of the “mnemonic narratives” veracity, in those villages which were inadvertently displayed both story and picture. Should an artist be trusted to know more about rice harvesting than a story teller? But, and we have to be careful here, pictures, intrinsically foreign to the Mende, come from an outside world validated by its technology.

How important can this ethical issue of the image be in a society with little advertising, video, or painting? How important is the lack of critical viewing in a country with little exposure to images? In final analysis, the answer should perhaps be democratic. Pictures appear thoroughly useful to a development agency eager for its recommendations to be adopted, and to farmers themselves, who view pictures of their activities as a kind of material representation of the development agency’s commitment.

In a broad understanding of local extension an overriding problem is the need for material to reach many people on multiple occasions, as farmers themselves pointed out. In response to the question “should the community be given more lessons with the flannel graph,” the chief of Ngelehun said “only if it is repeatedly done, but only one lesson offered is not adequate to keep us well informed. Something you want it perfectly done should be repeated several times for flexibility.” This may be overlooked in simple testing of media aids, but in any large population of poor farmers this problem of enough contact seems almost insurmountable.

Before I began this research, I was concerned primarily with cultural distortions and potential congruencies involved in standard agricultural extension. It wasn’t until I worked with Bo-Pujehun Rural Development Project that I realized the degree to which not only the kind, but the sheer quantity of information extended was important. Any cost-benefit observation of this extension program realizes that it would take, with their current staff, years to reach every villager once. In our region extension workers effectively visited perhaps 40 of the hundreds of villages in the area. Consequently, we need to be as concerned with extension substitutes as with extension aids.

Given this dimension of extension, we can learn from our lessons with visual and oral media aids. Much of the

problem in obtaining satisfactory story response was due to a failure to appreciate the cognitive and social principles underlying narrative memory. One could be a proponent of oral or visual aids, but let us synthesize what we know for a situation like Sierra Leone. Is it possible that using flannel graphs we can make narrative memories more easily recalled? From the use of narratives can we enhance the effectiveness of pictures?

A number of villagers, including teachers, said the flannel graphs could have been handily used by village teachers. These were not requests for more assistance, since they were referring to replacing an extension worker function. But to address this issue, free flannel graphs would have to be distributed to local instructors. Flannel graphs are cumbersome and require training to use. One needs to think of their free distribution only in extreme situations. They are time consuming to distribute and cost money to produce. If lots of teachers are to be reached it should be done without a lot of procedural effort. The more satisfactory use of agriculturally-related images for local instructors are posters that contain multiple training images, such as are used in oral rehydration health campaigns.

Then again, the director of the GTZ Bo-Pujehun agricultural program, K. Peters, found that using educational materials like flannel graphs did not have much impact in agricultural extension. He concluded it was due to inability to sufficiently train extensionists in their use. However, if one could supply a presenting device, then pictures could be viewed in an orderly manner without being administered by extension agents.

I want to amplify this because I think it resolves some of the issues involved. One would only present visual material if it could be cheaply reproduced and delivered, then supplemented by recorded instructions. The only cost effective transmission of recorded instructions is through radio, and one must recognize that if it was possible to penetrate the airwaves with an agriculturally-related program, it would have to be interesting enough to be listened to without visual material. Therefore, perhaps a synthesis of both stories and picture use, through poster distribution and radio programming, will serve to operationalize extension goals effectively.

Vansina (1985) maintained that oral tradition is conditioned in its growth by the prevailing information storage and communication needs of a non-literate society. In field research I observed that the needs of development, as the process of agricultural intensification is sometimes

called, may overwhelm the capacities of oral tradition. True, oral tradition and "mnemonic narratives" are distinct, but they stand in relation to each other as, say, a ceramic stove is related to a traditional hearth. Because the newer tool resembles the traditional, because it requires similar resources but reapplies them in contemporary circumstances, it seems benign, economical and appealing to outsiders. Foreigners with long experience among the Mende anticipated that stories would out-perform pictures. But what does that mean?

Villagers reported that "mnemonic narratives" and flannel graphs are sound communication instruments, and psychological and anthropological theory can be found to support both. In the early era of "diffusion of innovations" theory researchers accumulated data to support or refute basic contentions about what forms of communication assist development. By these standards "mnemonic narratives," as they were used in this exercise, were not very effective. But early diffusion research rested on assumptions which were never proved: it took for granted the superiority of western technological advancement. The protests of social scientists that have recently emerged has sometimes been to substitute the continuity of indigenous culture as the benchmark for appropriate development. Both of these perspectives reflect opinions and convictions, not just facts. In this intellectual environment to demonstrate that "mnemonic narratives," communication tools trying to bend to the shape of indigenous culture, do or do not spur innovation adoption does not show whether they have *a priori* succeeded or failed.

More practically, what can easily happen in development support media use is neglect of the underlying necessities in its presentation. It happened with the Bo-Pujehun Rural Development Project's use of flannel graphs in its agricultural program. Without proper training of extension workers, the project had unused or poorly used picture kits, and people reporting that "those visual supplements do not work." Similarly, there is the kind of neglect shown in our presentation of oral tales: stories improperly told and never repeated, leading to failure to reach an audience. "Those stories do not work," we say.

The solution to developing educational media for development extension is, finally, an *aesthetic* one. Underlying our final analysis must be the fact that some people found flannel graph pictures more attractive, more, in a word, "beautiful" than the stories. This is the Mende farmer's perspective, not the communication scientist's. While our results are negative within the framework of our original hypothesis, in fact the overall approval of the

media tools by the interviewed Mende confirmed overwhelmingly that both pictures and stories were "beautiful," and, hence, persuasive. As villagers themselves explained, a careful use of both stories and pictures resulted in the most effective presentation.

## Notes

<sup>1</sup>The districts of Bo and Pujehun cover an area of over 8000 km<sup>2</sup> within the Southern Province of Sierra Leone. More than 80% of the 320,000 inhabitants live in rural areas and farming is the principal activity. The author was granted access to a rice development scheme there, part of the German Agency for Technical Cooperation (GTZ) financed Bo-Pujehun Rural Development Project.

<sup>2</sup>It was reported that in one story-telling session the narrator was interrupted several times by people illuminating his meaning, which sounds like he "had it right." But inherently the extension workers were coming at the villagers with their presentations.

<sup>3</sup>The author can be contacted through the Dept. of Agricultural Journalism, UW-Madison, 440 Henry Mall, Madison, WI 53706 c 1991 Brian Coyle

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## IPRAS On Line

### Andrei Brushlinsky

*Institute of Psychology Russian Academy of Sciences*

I am pleased to announce that the Institute of Psychology Russian Academy of Sciences is now able to communicate with the international community via electronic mail. Special thanks to Alexandra Belyaeva's International Laboratory VEGA for their support in the implementation of this system.

The Institute of Psychology RAS (prior to 1992 known as the Institute of Psychology USSR Academy of Sciences) was founded in 1971 as a leading institution for complex development of psychological problems. The eminent Russian psychologist B.F. Lomov (1927-1989) helped organize the Institute and became its first Director. I was elected Director after Lomov's death at the end of 1989. Professor Y. A. Bodrov and Professor A. A. Mit'kin are Assistant Directors, with Dr. Y. A. Oleinik as a Scientific Secretary of the Institute.

The Institute is closely affiliated with the *Psychological Journal* (Psikhologicheskii Zhurnal), (Andrei Brushlinsky, Editor-in-Chief) and the majority of psychological centers. About 20 books are published annually by the Institute and about 30 post-graduate students (including foreigners) are allied with the Institute. The Institute takes part in international research projects and has direct agreements with some foreign research centers; about 50 scientists are received every year as guests.

Although a number of our researchers have already

been taking an active part in e-mail communication, we are interested in further expanding our contacts with foreign colleagues through this medium. We are willing to discuss with our colleagues a number of scientific-research and educational projects aimed at co-operation in the field of joint investigations, exchanges of scientists, preparation of joint publications, etc. We are open to all forms of communication.

We invite all psychologists participating in e-mail communication to exchange information of mutual interest and utilization through our various laboratories as well as the Directorate of the Institute. We shall answer all your questions with great pleasure.

There are four main branches of investigation currently being conducted at the Institute: 1) General Psychology; 2) Social Psychology; 3) Psychology of Labour and Engineering Psychology; and 4) Psychophysiology. Each branch is represented by several laboratories.

The scientific laboratories and groups, their leaders and e-mail addresses are as follows:

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**Psychology of Personality Laboratory**  
Prof. Csenija Aleksandrovna Abul'hanova  
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**Psychology of Inter-Group Relations Laboratory**  
Dr. Petr Nikolaievich Shikhirev  
(IPNS@ipras.msk.su)

**Psychology of Small Groups and Collectives Laboratory**  
Dr. Anatoly Laktionovich Zhuravlev  
(SAZHUR@ipras.msk.su)

**Psychology and Psychophysiology of Individuality Laboratory**  
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(drus@ipras.msk.su)

**Laboratory of Cognitive Processes**  
Dr. Nina Nikolaevna Korzh  
(KIN@ipras.msk.su)

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Prof. Tatyana Nikolaievna Ushakova  
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Dr. Larissa Grigor'evna Dikaya  
(WZAN@ipras.msk.su)

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Dr. Vladimir Yur'evich Krylov  
(MDRYN@ipras.msk.su)

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Dr. Vera Alexandrovna Koltsova  
(OLEINIK@IPRAS.MSK.SU)

**Psychological Problems of Communication Under Conditions of Modern Communication Technologies Group**

Dr. Alexandra Vladimirovna Belyaeva  
abelyaeva@home.vega.msk.su

**Diagnostics of Post-Traumatic Conditions Group**  
Dr. Nadezhda Vladimirovna Tarabrina  
(psy-pub@comlab.vega.msk.su)

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Messages to the laboratories which do not as yet have their own e-mail address should be directed to the following address:

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Please indicate the surname of the laboratory's leader and subject.

The Institute will be hosting an international conference, *History of Psychology: Past, Present and Future*. The conference will be held in Moscow and is scheduled for May 27 - June 2, 1992. This conference will be the first ever in our country on the history of psychology. We invite all to take part in it. For further information about the

conference, please contact the History of Psychology Laboratory e-mail address:

(OLEINIK@IPRAS.MSK.SU)

With hope for further communication, yours sincerely,

Andrei Brushlinsky  
Director of IP RAS  
129366, Moscow  
Jaroslavskaya, 13

## Work-in-Progress

### Scholarly Networking

**Alexandra Belyaeva**  
*Vega International Laboratory*  
Moscow, Russia

For the past several years the Vega International Laboratory has been seeking to develop optimal models for international scholarly collaboration, built upon the principles of public access and glasnost' and through the use of modern telecommunications technologies.

Presently, the Vega project is a Russian-American research collective which includes the following sub-projects:

- (1) advancement and study of joint activity among children and adults through telecommunications;
- (2) construction and analysis of our own joint activity on the basis of computer telecommunication;
- (3) the practical introduction to telecommunication of scholars representing Russia's humanities and social sciences, and the investigation of the psychological and socio-cultural peculiarities of this process.

Our international research collective has constructed, and is perfecting, a new form of extra-curricular instruction for younger schoolchildren based on computer-mediated joint activity between children from the two countries. This is a unique cultural object—the "Fifth Dimension"—in which one of the actors is an Electronic Wizard who is endowed with special functions and exists for the

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children only within telecommunication. Currently, the Vega project researchers are conducting joint work toward the creation of methods for measuring the "cognitive progress" of the child within the communicative instruction medium.

The system of interaction within the computer network among the very researchers who are working with children and with adult scholarly partners is also an object of our analysis. We are investigating individual-personal and socio-cultural factors which affect mutual understanding in the new medium—factors which promote or prevent the assimilation of new forms of interaction. We have studied the specific process by which the image of the partner is formed during the course of scholars' extended joint activity through the network; and we have analyzed the subsequent transformation of this image as a consequence of the scholars' subsequent face-to-face interaction.

A new direction in Vega International Laboratory's activity in the past year has been the practical introduction of Russia's scholars (individuals, research groups, and academic institutes) to international telecommunication, and the investigation of this highly complicated process which is of unquestionable socio-historical significance.

Vega has set itself the project of providing informational-consultative, psychological, and organizational-technical support to representatives of the social sciences, in order for them to develop the motivation and skills they need to interact with partners abroad through the network. This dimension of our investigative and practical work emerged at the moment of marked political, social, and economic upheaval and change within the former USSR. The necessity of assimilating new forms of international cooperation in science, and modern forms of organization of joint activity with scholars of other countries, has become for Russian scholars—in the literal sense—a condition for survival. But the subjective realization of the need for new forms of interaction has not yet coalesced among Russian humanities scholars (as well as among scientific leaders); practical and psychological readiness for such activity is absent in the majority of cases.

On September 10, 1992 the "open address" PSY-PUB (psy-pub@comlab.vega.msk.su) was established by the Vega laboratory to aid in the organization, support and investigation of interaction between ANY AND ALL Russian humanities researchers and ANY AND ALL scholarly partners abroad through the computer network—and vice versa. Up to the present time, this opportunity has

been used, and is being used, by over 100 Russian scholars and over 200 of their partners abroad, representing many humanities and social sciences disciplines.

The Vega project has also been instrumental in "hooking up to the network" various humanities institutes, scientific programs, and organizations, as well as supporting and investigating the process of formation of international interaction as dependent upon personal-psychological, professional (specific type of science), and socio-cultural context. So far, 10 research organizations have been hooked up to the telecommunications network in this way; meanwhile, Vega has been carrying out analytic work with all three dozen human sciences institutes of the Russian Academy of Sciences.

We welcome comments and queries about our work.

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