

Critical psychology: A territorial imperative

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Cultural relativism is a luxury third world countries cannot afford. With the possible exception of South Africa's apartheid policies, no third world country would seriously attempt to implement social policies based on the notion formulated by the Laboratory of Comparative Human Cognition that "all cultures have to be considered equally effective in producing ways of dealing with the problems of survival of our species under unique patterns of constraint" (1982, p.710). Quite apart from the awesome spectacle that some cultures appear to be considerably more effective in the ways they have produced to exterminate the species, the doctrine of cultural relativism has a hollow ring for people for whom the harsh realities of survival include famine, disease, oppression, and exploitation. But, perhaps, it is unfair to judge cultural relativism by what it says and, instead, it should be understood as an injunction to psychologists who conduct research in remote places away from home that they do not come from a privileged place. What this means is not necessarily that people always and everywhere are equally good at survival but only and importantly that psychologists should refrain from judging and ranking others because to do so is to come from a privileged place. Taken literally, however, cultural relativism is a truism of a singularly uninformative kind for both the development of scientific enquiry and for human emancipation.

There are two ways to assert that people are basically the same and they reflect the fundamental cleavage between theories concerned with states and theories concerned with change, between being and becoming. The fundamental problem of cultural relativism, as has been argued elsewhere (Miller, 1984), is that it is essentially a conservative doctrine. It does not and cannot address the problem of change. To assert that people are basically the same, that they have the same basic cognitive processes, is to assert that they

are people: and to argue that people are different because they experience different situations is to forget that they are people. To find our common humanity we need not search for what it is to be common but for what it is to be human. A science of human emancipation needs more than an assertion or even empirical evidence that people are good at what they do, not only because otherwise they would not survive long enough to bear witness to the claim, but because to be human is to be good at what others do and to do what no one has done before. The problem of cultural relativism is not whether it is right or wrong but that it entails a prescription for research that perpetuates psychology's perverse mimicry of the natural sciences and its consequent irrelevance to human affairs.

CULTURAL RELATIVISM AS A RESEARCH PARADIGM

A good example of how cultural relativism is put to work is provided by Cole (1978). The example is instructive because the assumptions are clearly stated and the conclusions follow with the impeccable logic that informs all tautologies no matter how complex or disguised their formulation. In an autobiographical account of an "Ethnographic Psychology of Cognition - So Far", Cole writes that he adopted the assumption "that people would be skilled at tasks they had to engage in often" (p.617) and he continues as follows:

"This statement may appear patently obvious or trivial, but its consequences are neither. Eventually it led me to reformulate the problem of the relation between experience and the development of cognitive processes, as I shall attempt to make clear presently."

Presumably the tasks that people engage in often are those that are effective for survival and the research task then is to identify the situations that elicit these tasks and to investigate how people become skilled in their execution. The important point to notice is that like the ubiquitous stimulus of experimental psychology, the task eliciting situation is "given"; in a laboratory by the experimenter and in the field by the culture. In both cases, the question of how the stimulus arrived in the experimenter's laboratory or the situation in the culture is ignored. The implications of this deliberate indulgence in ignorance require further analysis because it is this kind of bliss that is at the heart not only of Cole's explicit approach but of cross-cultural psychology in general.

If we apply Cole's assumptions not only to Kpelle rice farmers who are "masters at measuring rice" (1978, p.617) but also to Swiss scientists who presumably are masters at logico-mathematical thinking what form would our analysis take? We would observe all the situations in which Kpelle children participate in rice-measuring activities and how these situations are structured to encourage and teach the skills required for measuring rice. Similarly, we

would repeat this procedure for Genevan children. At the end of the day we would confirm Cole's reformulation of the relationship between experience and the development of cognitive processes.

"Cultural differences in cognition reside more in the situation to which particular cognitive processes are applied than in the existence of a process in one cultural group and its absence in another" (Cole et al 1971, p.233).

Given the assumptions with which we started and the methods of the investigation, it would indeed be surprising if we arrived at any other conclusion. What the analysis would provide is a set of descriptions and it is true that this kind of information is not entirely trivial. But this is not to say that it is theoretically informative. Nothing in the analysis can explain how people who are good at measuring rice can become good scientists and the reverse. But this problem need not be phrased in cross-cultural terms. The analysis also cannot explain how Kpelle farmers became good at measuring rice or Genevan scientists good at logico-mathematical thinking. Presumably these abilities are not created in heaven or *in utero*. The point, and it is the crucial point at least for psychology, and especially for psychologists interested in culture, is that situations do not create people, people create situations. The premise that science and its institutions provide an opportunity for the application of scientific thought is not only a poor substitute for theory but, if treated seriously, encourages us to forget that people create science and all the other activities we call culture.

To appreciate the implications of Cole's formulation concerning cross-cultural differences, it is important to recognise that he is critical of approaches in cross-cultural psychology that compare performances across cultures. This may be a valid criticism but it does not imply that Cole's own approach is either valid or necessarily better. Cole points out that the "use of "culture as independent variable" rests on a strong assumption" which, he argues, is "that psychological experiments "tap", "measure" or "assess" specific cognitive processes" (1978, p. 628). The problem with this assumption, he argues, is that failure to perform a task does not necessarily imply a lack of process. Leaving aside issues that may be methodologically important but are theoretically uninteresting such as the fact that people may be unwilling to perform, or disinterested in the task, or simply unfamiliar with the entire procedure, the problem Cole identifies is only a problem because culture or situations are regarded as independent variables. All of the prescriptions advocated by Cole and his associates (Laboratory of Comparative Human Cognition, 1982, p.674) including, "turning the Piagetian approach on its head", assuming "that learning is context-specific", "adopting a position championed 75 years ago by Thorndike", or the simple formula "Experience -- Task performance", not only miss the point but compound the very problem he attempts to solve. The

point is simply that the strong assumption about culture, or situations, or experience, as independent variables is an assumption not only that they are "variables" but that they are "independent" of either the actions they evoke or the psychological processes that generate action. To the extent that culture or situations are variables at all, they are dependent, that is, the products of human action. Children who do not conserve do not fail to perform on a **conservation** task and therefore lack **conservation** processes. The task only becomes a conservation task when children impose conservation structures on it. Likewise, from a psychological perspective, the earth only started to revolve around the sun after Copernicus rearranged the cosmic situation. People who believe that cultural differences reside in situations and not the reverse, must also believe in angels.

Jahoda (1980, pp.125-127) convincingly points out that Cole is most certainly wrong in believing that his theoretical formulations can be reconciled with those of Vygotsky, except by an inside-out transformation of Vygotsky into a social learning theorist. But the differences between Cole and most other cross-cultural psychologists, as Vygotsky pointed out, "arise out of the **theoretical interpretation** psychologists want to assign to the consequences of various stimulating environments and not out of variations in the general methodological approach within which observations are made" (1979, p.58/9). Cole is by no means alone in falling foul of Vygotsky's sharp criticism of what he referred to as the "inadequacy" of the "stimulus-response framework" (1979, pp.58-61). Jahoda's postulate that $B = f(P \times EC)$ (1980, p.129) expresses the same entrenched inverted reasoning that what is "given" to our understanding are psychological processes (P) and eco-culture (EC) and that what needs to be explained is behaviour. It is perplexing why psychology is so resilient in its resistance to the idea that what is given, not only to psychology but to all the human sciences, is human action, and that what requires explanation are the various manifestations of such action. The reason why Cole cannot have Vygotsky without Piaget, and a $B = f(P \times EC)$ version of cross-cultural psychology cannot have either, without distorting the very essence of their theories, is because they both attempt to understand how people construct the world of their experience from their actions and not how their actions are constructed from the world of their experience.

It is ironical that psychologists must learn from Marx, the father of sociology, that neither mind nor culture is thrust upon us from above but manufactured from below.

"In direct contrast to German philosophy, which descends from heaven to earth, here we ascend from earth to heaven. That is to say, we do not set out from what men say, imagine, or conceive, nor from what has been said, thought imagined, or conceived of men, in order to arrive at men in the flesh. We begin with real, active men, and from their real

life-processes show the development of the ideological reflexes and echoes of this life-process. The phantoms of the human brain also are necessary sublimates of men's material life-process, which can be empirically established and which is bound to material preconditions. Morality, religion, metaphysics, and other ideologies, and their corresponding forms of consciousness, no longer retain therefore their appearance of autonomous existence. They have no history, no development; it is men, who, in developing their material production and their material intercourse, change, along with this their real existence, their thinking and the products of their thinking. Life is not determined by consciousness, but consciousness by life. Those who adopt the first method of approach begin with consciousness, regarded as the living individual; those who adopt the second, which corresponds with real life, begin with the real living individuals themselves, and consider consciousness only as **their consciousness.**" (In Bottomore and Rubel, 1956, p.75)

PIAGETIAN AND VYGOTSKIAN PERSPECTIVES

The key to understanding both Piagetian and Vygotskian theory is to recognise that they address the same theoretical problem. For this reason, it is not suprising that they also adopt the same method which Vygotsky (1978, p.8) explicitly attributes to Marx. If knowledge or culture is not assumed but must be explained then learning in the empiricist sense of context or content-specific learning presents a paradox. This is simply that knowledge cannot be learned before it exists. Piagetian concepts, from object permanence to conservation, all demonstrate what may be termed the learning paradox. The force of Piaget's empirical studies is that he demonstrated that the objects of his consciousness or understanding are different from those of a child not because of anything in the objects themselves, from which knowledge could be "learned", but because of differences in their states of consciousness or conditions of understanding. In the case of Vygotsky the situation is complicated by the fact that "learning" is the primary concept in his theory. But Vygotsky's concept of learning is very different from any content-specific or S-R view of learning. It is not necessary to labour this point because Vygotsky (1978, pp.58-65) himself constantly rejected what he referred to as "naturalistic" or S-R approaches. It is, however, necessary to show, and in some detail, what Vygotsky's theory of learning does mean and why it not only addresses the same problem of the learning paradox but is also a necessary complement to the partial solution provided by Piaget. Before attempting a resolution of the Piagetian and Vygotskian approaches, it is necessary to consider in more detail Piaget's major theoretical construct upon which all the others hinge, the concept of equilibration.

Equilibration: A Piagetian approach to self-regulation

In an important sense, Piagetian theory starts and ends with the idea of equilibration. When Piaget says that "in the act of knowing the subject is active" (1964, pp.13-14), the activity that makes an act an act-of-knowing, is equilibration or self-regulation. The mechanisms of equilibration are the well known assimilation and accommodation processes that are built into the biology of the knowing subject and provide the basis for Piaget's claim that "intelligence is a particular instance of biological adaptation" (1952, pp.3-4). From the earliest co-ordination of simple sensori-motor schemes to the most complex formal operations, the construction of new understanding or new ways of assimilating the world is a function of self-regulation. But for all Piaget's (1977) formal descriptions of equilibration as a system of compensations and so on, in the final analysis equilibration remains unexplicated as a psychological construct. What the construct implies is the existence of a set of psychological mechanisms that operate on or regulate the various kinds of operations (concrete, formal, etc.) that Piaget has described. In this sense, the theory ends where it started with self-regulation as a hidden property of the organism. But the importance of self-regulation for understanding cross-cultural differences does not seem to have been fully explored.

Because equilibration has been considered mainly as an organismic property, the invariant sequence of the Piagetian stages has been taken as confirmatory evidence of an organismic regulatory system. Variations in the rate of acquisition of the stages is taken as evidence of non-organismic factors such as culture. The problem with this interpretation is that it allows learning of the kind that Piagetian theory specifically excludes to enter through the back door. Not only does Piagetian theory exclude learning as an explanation of development but, as Vygotsky points out, Piaget's method is designed to eliminate the influence of learning.

"The point of asking questions that are so far beyond the reach of the child's intellectual skills is to eliminate the influence of previous experience and knowledge. The experimenter seeks to obtain the tendencies of children's thinking in "pure" form, entirely independent of learning" (1979, p.80).

If the stages of development are a function of equilibration, then a delay (or acceleration) in their acquisition is a delay in equilibration; and if cultural factors influence the rate of acquisition of developmental stages then they influence equilibration. The same argument applies to findings that show that concrete and formal operations may be manifest in some domains of knowledge and not others. There is no way for culture to enter Piaget's epistemic subject other than via the process of equilibration. This is what Piaget means in his retort to Levi-Strauss's claims concerning the logical status

of complex kinship systems, that "What we want to know about is individual inventions" (1971, p.117). To suggest, as Jahoda does (1980, p.119) that Piaget did not develop the point about individual inventions is to overlook the fact that his entire theory represents the development of this very point. Whether or not all or only some adolescents in Geneva actually invent abstract systems is an empirical issue. Piaget's theoretical point is that if and when they do, the invention will be a function of equilibration or self-regulation; if it is not, and it is acquired by learning, then it will not be an invention at all. What this means is that culture can not creep into the system from the bottom up but must march in at the top and annex the system of self-regulation. To understand how this may happen, it is necessary to go above and beyond Piagetian theory; above in the sense that Pascual-Leone claims to stand on Piaget's shoulders in his explication of equilibration; beyond to Vygotsky's theory of mediation as an explication of self-regulation.

Pascual-Leone's neo-Piagetian "Theory of Constructive Operators" (1970, 1983, 1984; Pascual-Leone & Goodman, 1979) can be viewed as a functionalist modular modelling of equilibration in terms of a set of content-free operators that together co-determine performance across stages of development and across kinds of situations or tasks. He refers to these operators as "silent" in the sense that they operate on content or experiential processes (i.e., schemes) and regulate which of these will determine performance. For example, when confronted with a typical conservation experiment, children at different ages focus on different aspects of the situation and it is this "silent choice" of representing a situation in a particular way, that the theory attempts to explain in terms of a set of regulatory or constructive operators. Of the several operators Pascual-Leone has identified, most important from a developmental perspective are the **M** and **L** operators.

Pascual-Leone argues that cognitive developmental phenomena such as Piaget's vertical and horizontal decalages are primarily (but not entirely) a function of the **M** operator. This operator is conceptualized as a mental energy reserve or attentional capacity (similar to Piaget's centration mechanism) that is the main cause of and sets age-bound limits to such cognitive resources as "mental effort" (e.g., Kahneman, 1973) and "working memory" (e.g., Case, 1978). The reserve or capacity of the **M** operator increases with age and its strength or measure, in terms of the number of schemes it can boost (i.e., can drive or strongly activate), is referred to as **M** power. As the capacity of **M** increases, the number of schemes or units of information a child can apply in a given situation increases, and hence problems requiring greater informational complexity can be solved. This growth of attentional capacity is interpreted as caused by the maturational growth of the **M** operator, a purely organismic process indexed to chronological age.

Although structural changes in cognitive growth may be attributed to increases in M power, the M operator is not sufficient to explain development and Pascual-Leone identifies various kinds of learning operators. In the present context, they are referred to generically in terms of an L operator. The important point is that the L operator is conceptualized not as a set of content schemes but as a weight, power, or force that is applied to control and produce performance when, in a particular situation, a well learned or overlearned set of schemes is activated. For example, in the typical Piagetian conservation experiments, to succeed the child must resist or overcome not only the content but the force of previous learning in order to correctly solve the problem. In this sense, the L operator may facilitate or inhibit development depending on the nature of the situation and of the other silent operators that together co-determine performance.

The relation between the M and L operators is of particular interest because it is by means of M that it is possible to attend to new non-salient aspects of a situation or to override the effects of previous learning. However, the application of M (attentional energy) is a function of what Pascual-Leone calls executive schemes (i.e., plans) that mobilize M and these executives are learned. The role of executive schemes in mobilizing and regulating the application of M is evident in the distinction Pascual-Leone draws between structural and functional M-power, the former referring to the amount of M-energy available and the latter to the actual amount used. According to Pascual-Leone, field dependent people do not mobilize their full M-power and this, together with the effects of other silent operators, is responsible for their performance on various tests. The important point in interpreting field dependence in these terms is not that people do not use their full M-power potential but that they may not have appropriate executives to mobilize M. Pascual-Leone's theory is an idea tool for cross-cultural research, not only because it clearly distinguishes between developmental and learning operators, but also because the empirical methods used to test the theory control for the effects of learning. This is achieved by prior training and pretesting to ensure that all subjects have mastered the information needed on tests of M-power. In general, Pascual-Leone's explication of equilibration is based on a bilevel organization of the psychological system such that a set of content-free operators may be mobilized by learned executives to generate performance.

Mediation: A Vygotskian approach to self-regulation

In Piagetian theory equilibration represents a set of operators that generate "individual inventions" or, to use Vygotsky's terminology, "independent problem solving". However, Vygotsky proposes generative mechanisms of a different kind, not necessarily in competition but at least in co-operation with those proposed by Piaget and, more recently, by Pascual-Leone. Because of Vygotsky's emphasis on "learning", it is easy to lose sight of the fact that his

concern, no less than Piaget, was to explain, not only how people are able "to solve a variety of more advanced problems independently" (1979, p.88), but also to provide an explanation that does not fall foul of the learning paradox.

The essential difference between the Piagetian and "Vygotskian" approaches concerns the origin of what Vygotsky called "higher mental process". He argued that these processes, such as intelligence, memory, thought and language, have their origin, not in the biology of separate individual organisms but in the social life, cultural forms, or signs that are mediated through the agency of others. Unlike the contents of a stomach, the contents of a human mind do not have an independent existence. Meaning does not grow on trees. Meaningful human action is only possible in the context of a system of shared signs and, as such, is not the property of separate independent individuals. Fundamental to any understanding of Vygotsky is the distinction, implicit in his approach, between the psychological and biological individual. Volosinov (1973) points out that the term individual is usually "thought of in binary opposition" to the term social whereas the proper correlate of social is "natural" or biological.

"To avoid misunderstandings, a rigorous distinction must always be made between the concept of the individual as natural specimen without reference to the social world (i.e., the individual as object of the biologist's knowledge and study), and the concept of individuality which has the status of an ideological-semiotic superstructure over the natural individual and which, therefore, is a social concept. These two meanings of the word "individual" (the natural specimen and the person) are commonly confused, with the result that the arguments of most philosophers and psychologists constantly exhibit **quaternio terminorum**; now one concept is in force, now the other takes its place" (1973, p.34).

Higher mental processes that have their origin not in nature but in culture represent a semiotic superstructure over the structures of modern cognitive functionalist theories. In these theories, the individual is essentially a biological entity whose inner psychological mechanisms are, in principle, separate from those of other individuals much as one person's stomach is independent from another although both function in the same way. But when Vygotsky speaks of a uniquely human psychology defined by higher mental processes, he shifts the traditional boundaries of psychology and, in effect, initiates a discipline or domain of enquiry that lies at the interface between nature and culture. Higher mental processes partake of, and are constrained by, biological forms at one end and social forms at the other. Human action is the product of processes whose origins are as much social as they are biological and the problem for psychology is to understand the nature of the interface, the higher mental processes, that make possible or generate human

action.

The idea that higher mental processes such as thinking and independent problem solving are "social" in their origin requires careful analysis. In general terms, children are regulated by adults or, to use Vygotsky's term, adults mediate between children and their experience of the world. But the fact that children (and adults) learn from adults and not only as a result of direct experience with the environment, certainly does not cover or exhaust what Vygotsky means by social. In fact, this limited and restricted meaning of the term social whereby knowledge is transferred from one head to another leads directly to the learning paradox. The deep meaning of Vygotsky's claim that higher mental processes are social in origin is not that people learn from other people but that the products of mediated learning are social. What the child acquires in learning a culture is the network of meanings and rules that obtain between people. What is acquired through mediation is not the private intellectual property of individual learners but the collective and cumulative intellectual tools of historical others, what Vygotsky calls "culturally organized, specifically human, psychological functions". Each generation of children confronts a new world constructed and transformed by previous generations. Sight and hearing are biological properties of individual beings but looking and listening are cultural properties, gifts of history and not of nature. These gifts are bestowed through the mediation of others but it is not sheer otherness that constitutes the social dimension of human existence. When children are taught how to look and listen they become part of history because they learn to participate, not only in a world of objects animate and inanimate but, in a universe of meaning that transcends the individuality of biological existence because it is constituted not in but through and between people.

For Vygotsky the problem is to explain how children "grow into the intellectual life of those around them" (1979, p.88), that is acquire the cultural rules or meanings that regulate action. He proposes that mediation creates what he refers to as a "zone of proximal development". It is interesting, and also instructive, that Vygotsky provides two accounts of the zone of proximal development and yet it is usually only the first descriptive statement that is quoted (for example; Bruner, Cole, Brown and Ferrara, Wertsch, Wertsch and Stone, in Wertsch, 1985).

"It is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (1978 p.86)

Given his distinction between description and explanation of psychological processes, it is not surprising that Vygotsky goes on to pose the question "What, then, is defined by the Zone of Proximal Development.....?" It is his

answer to this question that deserves attention because it shifts the emphasis away from the descriptive to an explanatory level of analysis and firmly grounds the concept within the broader context of his general theory.

"The zone of proximal development defines those functions that have not yet matured but are in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state. These functions could be termed the "buds" or "flowers" of development rather than the "fruits" of development. The actual development level characterizes mental development retrospectively, while the zone of proximal development characterizes mental development prospectively" (1978, pp.86-87).

The force of Vygotsky's "flowers" and "fruits" metaphor is to drive home the point that an explanation, as opposed to a description, of a psychological process can only be achieved through a "disclosure of its genesis, its causal dynamic base" (1978, p.62) or what today are commonly referred to as generative mechanisms (for example: Bunge, 1973; Bhaskar, 1979; Chomsky, 1975; Harre and Secord, 1972).

If we focus exclusively on Vygotsky's descriptive statement that the zone of proximal development is the distance between actual and potential levels of development that may be achieved with the help of others, then it is easy to lose sight of the fact that it is the child's "independent developmental achievement" (1978, p.80) that ultimately must be explained. Vygotsky's proposal that "the only 'good learning' is that which is in advance of development" (1978, p.89) together with the statement that "the zone of proximal development characterizes development prospectively" (1978, p.87) leaves little doubt that he clearly recognized and attempted to identify in development generative mechanisms to explain how human learning equips people to solve new problems independently, and to cope with unfamiliar situations. In discussing the zone of proximal development, Cole (1985) provides examples of how adults interact with children and teach them skills such as weaving (see Childs and Greenfield, 1982) and tailoring (see Lave, 1978) by breaking down the process into a number of steps and allowing children to become proficient at each level of the task. He points out that children have witnessed the entire process many times so that from the start they begin to "practice what they already know" (1985, p.157). Vygotsky's point appears to be the very opposite. The zone of proximal development provides an opportunity for children to practice what they do not know. A flower is not a little or immature fruit and neither does it become a fruit in a graded set of steps. A flower contains within it a set of mechanisms that will generate a fruit. By means of these mechanisms a flower is transformed into a fruit. It is true that little fruits grow into large ripe ones and the same is true of little weavers and tailors. How this happens may be of interest but it is a

different order of explanation from that required to answer how flowers are transformed into fruits. People do not transform the world or their conditions of existence by "practicing what they already know".

The notion of generative mechanisms is useful if we attempt to extract some general formulation from the matrix of learning and developmental processes that are at work in the zone of proximal development. The problem is not only how external social knowledge or culture is internalized by individual children but how individuals are able to use their socially derived intellectual equipment creatively to transform both nature and culture. This is a necessary theoretical consideration in order to avoid the trap of the learning paradox and to provide, in principle, an account of how culture is possible. The zone of proximal development may be conceptualized as the co-ordination between two sets of generative mechanisms. Culture as mediated to the child represents a set of extrinsic generative mechanisms; what Geertz refers to "as a set of control mechanisms - plans, recipes, rules, instruction - for the governing of behaviour (1973, p.44). Children's actions (looking and listening for example) are regulated by adults according to culturally prescribed control mechanisms; problems are defined, methods of solution prescribed, sources of information provided, styles of processing encouraged. In this way, children begin to practice what they do not yet know and, in this sense, learning is in advance of development. The internal machinery inherent in human biology may be understood as intrinsic generative mechanisms; Piaget's equilibration processes or Pascual-Leone's silent operators that regulate action from within and constrain the kinds of actions children can perform on their own. Real children, however, never act alone. Concealed within the self of each individual person are the social tools that regulate the life processes of historical others.

It remains to clarify the nature of the social tools that constitute the human intellect. Geertz's conception of culture as a set of control mechanisms rather than as "complexes of behavior patterns - customs, usages, traditions, habit clusters" (1973, p.44) reflects a similar bilevel structure as that inherent in Piaget and Pascual-Leone's equilibration models. The point of a bilevel structure, whether of mind or culture, is to accommodate a moment of constructivity or transformation without which change is not possible. Politics, puddings, and games embody the constraints of plans, recipes, and rules; in general, all manufactured goods whether by mind or machine embody the constraints of the tools of their manufacture. But the tools of pudding construction, recipe, mixer, and oven, are no more inside the pudding than kinship systems and wedding rings are inside a marriage or culture is inside a situation. This distinction between the contents of culture, and what Luria refers to as the "actual forms of culture" (1976, p.3), is implicit in Vygotsky's theory of mediation.

The distinctive feature of human mediation is that in the process of learning a specific task, such as baking a cake, children learn not only about cakes but also about recipes; and what they learn about the relationship between cakes and recipes is that when you eat a cake you do not also eat the recipe. The cultural form of a cake is its recipe, the conditions of its production, and what is transmitted through culture or learned through mediation are not only cakes, or tasks, or situations, but the tools of their construction. When children are guided through a task by a mediator who regulates their actions, the regulations embody the constraints of the cultural forms or tools that transform a "situation" into a meaningful task. These outer-regulations may be conceptualized as "mediational operators" in the sense that they apply on specific contents but are not constituted by the particular objects or events. When these outer-regulations or mediational operators are learned or internalized as self-regulations, they function as social tools. In this sense, Vygotsky's higher mental processes are reflections of cultural forms that, in turn, embody the constraints of these processes.

The problem that Vygotsky and Luria addressed in their cross-cultural research, conducted some fifty years ago in the Soviet Union, can be addressed only within the framework of a theory of mediation that serves as an interface between the silent operators of biological individuals and the hidden mediational operators of social others.

We still do not know whether changes in socioeconomic structures or changes in the nature of social practice result only in broadened experience, acquisition of new habits and knowledge, literacy, and so forth, or whether they result in radical reorganization of mental process, changes at the structural level of mental activity, and the formation of new mental systems. Proof of the latter would be of fundamental significance for psychology as a science of social history" (Luria, 1976, p.12).

Like the question posed, the answer appears obscure if psychological and cultural processes are regarded as "fixed forms of spiritual life and remain unchanged under different social conditions" (Luria, 1976, p.164).

"... as the basic forms of activity change, as literacy is mastered, and a new stage of social and historical practice is reached, major shifts occur in human mental activity. These are not limited simply to an expanding of man's horizons, but involve the creation of new motives for action and radically affect the structure of cognitive processes" (1976, p.161).

The argument of cultural relativists that mental processes are always and everywhere the same but that they are applied differently to meet the demands of specific situations is also no doubt true provided that the process

of application is not attributed to the constructive power of the passive form of English grammar but to the generative power of human minds constituted by social tools.

It is, perhaps, appropriate to conclude on a speculative note. Culture must have started when a disgruntled radical primate realized that she could have her cake and eat it. Cross-cultural psychology will begin in earnest when similar minded psychologists realize that you can have culture and change it.

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