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THOMAS S. WEISNER

For centuries there has been the belief that living in the city makes men different from those in the country. The same hypothesis has been applied to memory and cognitive skills acquired by children in city and country settings. Most comparative investigations have demonstrated that city children appear to acquire some tested cognitive skills earlier than do rural children. Cross-cultural work on rural-urban differences typically finds similar results. Rural-urban comparisons, however, are often confounded by other differences

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in the samples of children or adults—for example, city children may have more Western education, or live in different kinds of families, or differ in acculturation to Western patterns compared to their rural counterparts. Just what it is about the city that makes for test differences is hard to disentangle. A related problem is that of the tests, tasks, and experimental situations presented to children: are these perceived and interpreted in the same ways by city and country children? This paper explores both these issues—what factors might account for rural-urban differences in certain experimental tasks; and what characteristics of experimental settings interact with urban-rural differences to influence the direction of those differences in particular tasks.

SOME PREVIOUS LITERATURE ON RURAL-URBAN DIFFERENCES IN COGNITIVE PERFORMANCE

Several different kinds of cognitive tasks have been explored in Africa which have involved some sort of direct rural-urban contrast (see Lloyd 1972). Such studies also frequently contrast schooled with unschooled, or acculturated with nonacculturated groups. Studies include sorting and learning tasks, similarity judgments of line length, susceptibility to illusions, field dependence-independence, eidetic imagery, attainment of scientific concepts, Piagetian conservation tasks, and others. This brief review focuses on the reasons for and direction of urban-rural differences across many kinds of cognitive skills in a search for clues to general patterns of difference, rather than emphasizing the particular cognitive task involved.

Evans and Segall (1969) studied sorting and learning tasks using pictures of objects that contrasted according to function and color. They tested Baganda children from three primary school levels, in rural, semirural, and urban locations, as well as a rural unschooled group of children. Children all learned the color classification criterion much more readily than they learned the functional criterion. (These were trials-to-criterion scores.) Children older and in more advanced school grades were progressively more likely to learn the functional criterion. In addition, there was a progression from rural to semirural and urban in the success in learning to sort by function. There were no rural-to-urban differences in learning the color criterion. Educational level was a better predictor of

learning functional criteria than was age, although age and education were confounded.

Evans and Segall provide an interesting, straightforward interpretation of their findings. *Physical* appearances of the test stimuli are immediately obvious; these will naturally be utilized first, rather than the more complex functional reasons for grouping. Schooling and urbanization combine to provide more "experience" (of some kind), which leads to greater facility in reading the pictures and in comprehending the functional sorting option in addition to the color sorting one. Evans and Segall suggest that the experimental task and the test situation imply, for the "inexperienced" (rural, nonschooled) child, that color, being obvious, was the *expected* dimension to use. Unschooled children and rural adults with low levels of education were inexperienced in this sense. Urbanization-education-experience, as a syndrome of some kind, influences the experimental setting as perceived by the subjects, as well as the likelihood that they will engage in multiple learning of more than one (the obvious, color) dimension.

Schmidt and Nzimande (1970) contrasted the effects of literacy, schooling, and urban or rural residence on color versus form preferences in a sorting task using colored triangles and circles. They found a hierarchy in the number of Bantu Zulu subjects using color as classificatory mode in the following sequences (of more to less preference for color): rural children not in school; rural children in school; illiterate farm workers; illiterate urban workers; literate urban workers. Schooled rural Zulu children were also more likely to use more than one criterion for sorting than were unschooled, and were more likely to use all three criteria in sorting. Urban subjects gave more sortings, more reasons for their sortings, and used more criteria than rural children.

Scribner (Cole and Scribner 1974:135–136) had her Kpelle subjects manipulate and sort into groups objects "that went together"; these groups were then mixed and the subject was asked to regroup the same way, and continue until a criterion was reached. The subject was then asked to recall as many of the items as possible. There was a relation between the "kind of organizing principle used to group material and its efficiency as a guide to recall" (136). The principles used, however, ranged from quite general, taxonomic categories to specific ones. High school students, cash workers, rice

farmers, and rural isolated farmers in that order were respectively less likely to use taxonomic categories, and higher recall cluster scores were associated with the use of taxonomic categories. Thus *any* category system chosen spontaneously by the subjects helped in recall compared to unrelated groupings; but taxonomic categories helped more than nontaxonomic ones in recall.

Scribner also reported a study relevant to the task of describing and verbalizing the reasons for a particular kind of classification (Cole and Scribner 1974:118–121). Education increases the explicit *verbalization* and labeling of classifications made in sorting. Two children may have sorted objects into identical groups; the schooled child (or adult), however, is more likely to provide class names or refer verbally to criterial attributes of the objects in explaining to the experimenter the reasons for the groups formed.

Schooling and acculturation also seem to encourage deutero-learning, or learning-to-learn—the understanding of the principle of a task, experiment, or learning situation. The use of multiple principles for sorting and classifying, and the recognition of the possibility of selecting between viable *alternative* rules and principles, appears to be enhanced by education and acculturation, although the evidence for an acculturation effect is weak. To the extent that urban residence is more likely than rural to be acculturative, urban subjects should more often use taxonomic categories, several modes of classifying, and should also be more "test-wise" and flexible in their behavior.

Maccoby and Modiano (1969) asked Mexican urban and rural children to state how a series of objects were similar or different, and classified responses into five types according to the kind of reasons given: perceptible criteria; functional; moral-affective; nominal or superordinate; and reasoning by decree ("they are just alike"). Three collapsed types were formed: concrete; concrete-abstract; and abstract cognitive types. Children ages 12 and 13 were tested. Urban children were considerably more likely to give "abstract" criteria, while rural children were more likely to give "concrete." The authors emphasize that the rural children can use abstract concepts; but they chose to respond to the *task* by using perceptible attributes and to differentiate easily according to these. Urban children also use concrete attributes, but add nominal and abstract functional criteria not present in the rural, peasant groups.

Barry, Child, and Bacon (1959) predict that socialization practices in low food accumulation societies favor independence, whereas high food accumulation societies favor conformity to group norms. Berry (1967) tested independence and conformity in a culture (Eskimo) where food accumulation was low, and in another culture (Temne) where food accumulation was high. Berry tested the relative conformity to group norms using a line length judgment task. Subjects were asked to identify which of eight lines was the same length as a standard line at the top of the page. Subjects were told that "most (Eskimo, etc.) say this line is equal in length to the one at the top." The line pointed to by the experimenter was the correct line. Berry predicted that Eskimo would be less influenced by group norms in choosing a line than would Temne, and that rural traditional communities would be relatively more susceptible to group norm influence than would urban/transitional subjects. Eskimo subjects were indeed far less influenced by the group norm than were Temne. Rural/traditional samples were more susceptible to the norm than urban/transitional samples, but these trends were not statistically significant. Thus urban/transitional subjects conform to group norms less often, but these trends are within the context of a more general baseline of societal ecological and socialization pressures toward conformity or independence.

Berry (1967) also has shown greater field independence in Eskimo compared to Temne subjects using embedded figures (Witkin and Berry 1975, Witkin *et al.* 1962, 1973), and Kohs Blocks (Kohs 1923, Wechsler 1958:79–81). Urban/transitional subjects were more field independent than rural/traditional within each culture—but these differences were weaker than the cross-cultural diffrence. Field independence may be associated with other cognitive and perhaps social-behavioral indications of nonconformity with group norms, or with increased child autonomy in the presence of adults.

Okonji (1969) has reported data on field independence using Witkin's rod and frame test. Urban Nigerian college undergraduates were tested, some of whom came from urban, literate homes, and others from rural, illiterate homes. The students were all Ibos from Eastern Nigeria. Males from urban, literate home backgrounds were more field independent than rural males on the rod and frame test. (Some other tests, however, did not produce significant differences.) This study confounds "analytic" cognitive

style, perhaps measured by the rod and frame test, with other possible, but unmeasured or unconfirmed, differences in style. Urban upbringing is also confounded with literacy in the study although the education of the subjects themselves was identical.

Doob (1974) performed an eidetic imagery test in Eastern Nigeria using rural and urban Ibo children and adults; rural adults were far more likely to be purely or partially eidetic in their imagery recall than were urban adults; rural and urban children, however, did not differ. Similarly, urban adults were significantly *less* eidetic than urban children, while rural adults were not significantly different from rural children. There was a higher proportion of illiterates in the rural sample, confounding the urban-rural setting differences. Doob suggests that prolonged urban residence in Nigeria produces a loss of a culturally high level of eidetic imagery among Ibo.

Poole (1968) compared rural Hausa, urban Hausa, and Hausa living in intermediate-sized market villages on a test of "scientific concept attainment," using a test developed by King (1963). The African children tested were 10 and 11 years old. Overall, significant differences were found in degree of scientific concepts exhibited in this test between rural and intermediate, and between intermediate and urban Hausa children, as well as between urban Hausa and a sample of English children of the same ages.

Poole (1968:62) interprets these findings in a straightforward acculturation framework: scientific concepts overlay Hausa concepts; the rural setting is "conservative" and thus ensures slower acculturation. Urbanization "forces upon people some degree of receptiveness to novelty." Page (1973:13, table 1) also found a nonsignificant trend for urban Zulu children to score higher on geometry and spatial tests.

Greenfield (1966) carried out a series of conservation tasks among the Wolof of Senegal and among American children. The Wolof samples included schooled and unschooled children in rural settings, and an urban, schooled sample. Two findings are relevant to the immediate question of urban-rural cognitive differences and the experimental situation. Primary grade 1 and 3 Wolof children in the city were low in the percentages of children showing conservation responses compared to rural school children; by grade 6 (ages 11–13) this difference disappears, and virtually all the chil-

dren show conservation responses. Only about 50% of the unschooled children (all rural) by ages 11–13 displayed conservation responses. Thus educated children eventually gave conservation responses regardless of urban or rural residence; unschooled often did not. Rural and urban children also differed on the reasons for conservation or nonconservation responses. Urban children gave perceptual reasons focused on one attribute of the task more than did rural children. Most urban-rural differences centered on greater use of perceptual reasons for urban nonconservation responses. Greenfield interprets this difference as owing to linguistic differences between city and country, rather than to environmental or test-situation differences: the Wolof language spoken as a lingua franca in Dakar was "descriptively less varied" than rural Wolof (1966:241–242).

One other aspect of Greenfield's study is of interest—the effect of the adult experimenter on rural, unschooled children. Children who watch the experimenter pour the water do not give conservation responses; children who pour water themselves, with the experimenter withdrawing, give conservation responses. Greenfield's interpretation is that the authority figure/experimenter draws the attention of the child to the exclusion of the task itself; the child then gives more nonconservation responses based on what the experimenter did. If manipulation and active involvement by the child does increase conservation responses (cf. Price-Williams 1961), then children who were more likely to intervene with the experimenter-authority figure in the experimental situation would be more likely on this ground alone to perform better on such tasks.

Piaget himself has used an urban-rural, or literate-illiterate, difference as an example of the effects of cultural, educational, and interpersonal factors (1974:305–306). (He reviews a study by Mohseni done in Iran with rural illiterate and urban-schooled children.) Piaget suggests that a combination of low stimulation from toys, the absence of formal education, and the "apathy and passivity" of rural children combine to produce decrements in age of conservation and in other tasks. These factors can occur in cities and small towns as well as in rural settings. Here as in other studies, "urban-rural" differences are being used as a label for a combination of acculturative, educational, social-interactional, and (perhaps) nutritional differences. Indeed, Dasen (1974:422) specifically

states in his general review that most studies of rural-urban differences in cognitive development usually are a proxy measure of European contact.

SUMMARY

Urban children in these studies were less influenced by the experimental "set," and were more flexible than rural children in the use of multiple responses to expectations presumed in the test situation (Evans and Segall 1969, Schmidt and Nzimande 1970, Cole and Scribner 1974, Maccoby and Modiano 1969). Berry (1967) generalizes this to a tendency for greater compliance in societies whose ecologies encourage high food accumulation, and relatively less compliance in urban/acculturated groups within cultures. Berry, Okonji, and others report increased field independence in urban/acculturated groups. There is some indication that urban/acculturated groups are more verbal in test responses (Cole and Scribner 1974), but Greenfield's (1966) study found differential skill in first language to work to urban children's disadvantage in conservation tasks.

City residence seems to make children and adults less compliant, more "savvy," and perhaps more talkative in test situations, and hence more likely to display multiple classification criteria, to alter initial perceptual cues into more "abstract" ones, and generally to act in ways likely to be successful in many experimental settings. This kind of increased flexibility also occurs with schooling, urban occupational experience, and acculturation. In those studies where some controls were introduced, schooling and/or acculturation appear to be more powerful factors than city residence per se.

The reasons given for these differences are very diverse. They include "general acculturation"; greater urban exposure to "complexity and diversity"; differential home and parental experience in cities; difference in language skills and use; differential migration from rural areas to the city; nutritional differences, and others.

Urban-rural differences reviewed here are primarily intracultural. Even so, considerable variability exists in the types of urban-rural settings, and in the influence of ethnic differences, acculturation, and other factors. "Rural" and "urban" settings vary widely cross-culturally as well, adding further complexity and additional considerations of comparative validity. Cross-cultural findings on city and country differences generally are consistent with intracultural

work. The specific characteristics of city and country settings need to be carefully defined, however, just as do cognitive tasks and experimental situations.

URBAN-RURAL DIFFERENCES: TWO HYPOTHESES

Experimental tasks that call for some assertiveness, independent judgment, multiple and varied responses, and some manipulative and exploratory behavior by the subject, might be called *exploratory-manipulative tasks.* Examples of such standard cognitive tests include free-sorting tasks, especially where multiple sorts are asked for; spontaneous verbalization or reasoning expected of children for responses given; and expectations of the subject to break an experimental set, particularly a set based on perceptual, immediate cues. Such tasks should favor urban populations.

Tasks that do not require such behavior, or which require compliance, deference to the experimenter, and following explicit and clear instructions, should favor rural subjects. Such *instruction-specific tasks* provide directions to the subject, with clear, unambiguous tasks to perform. Digit recall, tests for handedness, counting tasks, and recall of specific objects are examples of such tasks used in this study. Following directions and compliance with such directions are directly related to successful performance of the task, and the tasks are not very novel or unusual for the child.

These hypotheses propose an interaction between constraints of the experimental situation and previous urban or rural experience. The experimental constraints have been reviewed, and there appears to be some evidence for the effect. What of the urban-rural situation? Why does it produce these behavioral differences?

SOCIALIZATION FOR COMPLIANCE: URBAN-RURAL AND CULTURAL DIFFERENCES

In a study of social-behavioral differences between rural and urban children in Kenya, urban children appeared as more aggressive in interaction with peers, more often talking with adults, and less sociable and cooperative in interactions with other children, compared to a matched group of rural children from the Abaluyia tribe of Western Kenya (Weisner 1974). These differences were related to several critical features of city life in Kenya. There are more adults around city children, and they live in a far

more crowded space, with little room to explore or leave the home setting. Mothers are present much of the day in town, whereas in the country mothers more often are able to delegate child care tasks. Urban mothers have few chores and tasks to perform, while in the country women and children are busy with horticultural and domestic tasks.

In rural settings larger groups of siblings and related kin including older child caretakers are common; older children are less often present in the city, since they are likely to be in school in the country, and are needed there to perform important chores and tasks in the rural home setting. This means that mothers in the city have no "buffer" of older children to assist in child care; interaction between adults generally, and mothers in particular, is thus much higher in the city. In addition, the absence of important chores and tasks to be done in the city reduces the social responsibility demands on children; there are fewer things to do each day for which mothers need and expect compliance from their children. These situational influences reduce demands for compliance and increase adult interactions.

There are in addition all the other environmental factors between city and country mentioned by many authors, including a greater variety of situations that are more often novel for children and adults alike; multilingualism and increased use of lingua franca, such as Kiswahili; and increased verbal interactions generally. This greater diversity in settings, rather than exposure to more Western, acculturating situations per se, may be important in differential reactions on experimental tasks.

These rural-urban differences parallel other relationships between compliance, acculturation, and changing African socialization practices summarized by Munroe, Munroe, and LeVine (1972). Habitual deference patterns and relatively passive cognitive styles have been noted in several studies of rural African settings.

In societies with strong emphasis on compliance, schooling has been shown to change cognitive functioning in the direction of Western norms, but the change is usually only partial and does not involve any modification of the traditional deference patterns (cf. Klingelhofer 1971). In school, the teacher-student relationship is based on the traditional expectation of full, unquestioning acceptance of the teacher's authority, and out of school the child still is likely to be punished for

asking "Why?" when given a chore. But such patterns may be undergoing a good deal of change in the westernizing patterns of Africa (1972:109).

City residence, acculturation, or education all appear to have such an effect. Furthermore, the specific situations and experiences of the urban child—few tasks, novel, unfamiliar situations with many adults and few older siblings—seem likely to encourage increased assertiveness at the expense of traditional compliance.

Munroe and Munroe (1972) found Kikuyu children aged five to nine to be highly compliant when asked by either their own or another child's mother to pick up toys and put them in a box, whereas Landauer, *et al.* (1970) found that American children were more compliant when asked by other mothers. In a subsequent study (Munroe and Munroe 1975) utilizing similar procedures, white American mothers and children were compared to the Kikuyu sample for two kinds of commands: proscriptive ("don't touch the toys") and prescriptive ("pick up the blocks"). The American and Kikuyu children did not differ in compliance to the proscriptive command, but Kikuyu children picked up the blocks longer and faster than American children did. The proscriptive command involved only passive obedience, while the prescriptive command required active compliance for an extended period of time. Hence there is some direct evidence that some African children are more generally compliant to adult women, and that they more readily and more often comply to prescriptive requests.

Ainsworth and Ainsworth (1962:429) also hypothesize a relationship between acculturation (by which they mean exposure to Western, European practices, ideals, and languages) and response to difficult and novel tasks. They found that more acculturated Ugandan subjects were "more flexible in a problem-solving situation, while the less acculturated were more rigid, clinging more tenaciously to habitual solutions which were no longer appropriate."

Urbanizing experience and acculturation are similar in many respects. There is an urban culture, distinct from a rural culture, and it is noticeable not only in differences in urban physical settings, acculturation, or in household organization. Ethnographic data collected over a two-and-one-half-year period in Nairobi and Western Kenya confirm what mothers and fathers say themselves:

city-reared children are less compliant, more talkative, more "roguish," in the local translation of an English phrase. Parents worry about their children becoming rogues in the towns, and express concern over leaving children in the city too long, lest they have trouble adapting to life on a rural homestead later on in life. These are parental responses to a very general situational-cultural difference characteristic of many rural-urban, as well as traditional-acculturated environments. Sources of insight into this African urban culture range from African literature (Ekwensi 1966, p'Bitek 1971) to ethnographic work done in African cities (e.g. Marris 1962, Southall 1961, Miner 1967), to general surveys of development and its implications in urban Africa (e.g. Hanna and Hanna 1971).

Ethnographic observations on children, parents, and urban-rural cultural differences supplement specific studies on cognition in suggesting differences in compliance and response to adult (experimenter) authority. These city-country differences reflect general differences at the cultural level, which in turn are tied to specific characteristics of the parents' and children's own immediate situations (increased mother presence, crowding, absence of tasks, etc.), which in turn are associated with differential performance. It is this chain of influence from general characteristics of city and country settings, to specific tasks and behaviors, which is the key to effective integration of anthropological-ethnographic and cognitive task data.

SAMPLE AND TEST BACKGROUND

Many factors can and usually do confound direct rural-urban comparisons, whether of families, adults, or children. Some of these factors were mentioned above—educational differences, language skills, work and occupational status, and so forth. Differential migration to an urban area from a rural one is also a factor, as is acculturative influences before and after migration which may influence child-rearing techniques. The sample of children used in this study is less prone to such confounding influences than most rural-urban African samples. These children come from families that are part of a rural-urban network of periodic and recurrent migrants to urban areas. All the families speak the same dialect of Luluyia, a Bantu language, and visit and maintain con-

tacts with each other within city and country, and between city and country. Weisner (1973*a*, 1973*b*) describes this sample of matched rural and urban families in detail. For present purposes, the sample of children is culturally, including acculturatively, quite homogeneous, and the parents of these children are matched by age, education, and kin status. Urban experience of the children differs within the sample; other possible confounding acculturative factors are relatively weak, perhaps as weak as is possible to find in a naturally occurring rural-urban comparison.

There were sixty-six children tested in all, forty in the rural community and twenty-six in Nairobi. The children ranged from age four to thirteen, both boys and girls, with varying amounts of education. Ideally, equal numbers of children in city and country locations of specific ages, sexes, and educational backgrounds would have been preferred. The final sample only partially attained this goal. The sample does, however, reflect the cultural homogeneity of the rural-urban network system, and all the children speak the same dialect of Luluyia. Table 1 provides some background information on the sample.

All the testing was done in the children's homes. Other children and adults were asked to leave the room where the test was being given, but there was inevitably a certain amount of notice taken

TABLE 1
DESCRIPTION OF SAMPLE OF RURAL AND URBAN KENYA CHILDREN (N = 66)

		Rural *N*	*Urban* *N*	*Total* *N*
Age	4–7	13	13	26
	8–10	13	8	21
	11–13	14	5	19
Sex	Boys	20	17	37
	Girls	20	9	29
Years in school	None	18	14	32
	1	14	4	18
	2–3	5	4	9
	4–7	4	4	8
Number of years in city	None	22	0	22
	1	11	3	14
	2	5	4	9
	3 or more	2	19	21

by others around the testing location. Two testers were used; one was a male secondary school teacher of science, the other was a female undergraduate student at the University of Nairobi, majoring in education. Although considerable training was done prior to testing, intertester reliability in the field was unable to be obtained.

The tester rated the children following the test on a series of measures designed to provide some data on the test-receptivity of the child. These ratings included: the emotional state of the child during the test (was he fearful, quiet and relaxed, or cheerful and friendly?); the attentiveness of the child to the tasks; and the apparent level of comprehension of the tests. The child's language abilities (whether he was bi- or multilingual) were also rated.

No relationship was found between emotional state, comprehension, attentiveness, and age and sex of child. Urban children, however, were reported by the experimenters to comprehend better the tasks in the test series. Urban children were also reported to be more attentive to the task than were the rural subjects.

A fourth "test setting" variable was language facility, rated by the experimenter and asked of the child after the tests. Urban children were more likely than rural children to be bi- or multilingual. Eighty-eight percent of all rural children spoke only Luluyia compared to 40% of all urban children; 39% and 12% of urban and rural children spoke some Kiswahili; 15% and 13% spoke some English in city and country, respectively. There were no age or sex differences in multilingual skills. Thus two possible "test-receptive" traits differ between city and country children in Kenya: comprehension of the test set; and increased bilingual language skills in Kiswahili.

Test Procedures

A series of tasks, which together took between twenty and thirty minutes to complete, was designed to tap several kinds of skills. The complete series of tasks, in the order presented, is listed below.

Rote memory. 1. Children were asked to count as high as they could count, in whatever language they wanted to use (if the child knew more than one language). The highest number reached in counting was recorded.

2. Children were then given standard strings of digits, read by

the tester, which the children were asked to recall. The digit strings were continued until the child missed two strings consecutively. The number of correct strings repeated was recorded.

Left-right knowledge and reversibility. Each child was asked which was his right and left hand. The experimenter then turned his back to the child and asked which was the experimenter's right and left hands. Finally, the experimenter turned and faced the child and asked which was his right and left hand. The child's response was recorded for each of these six questions. Price-Williams and LeVine (1974) have summarized the data on other cross-cultural investigations of handedness and reversibility. My procedure differs slightly from others in that the experimenter first turned his back to the child and only then faced the child to test for reversibility. This addition to the procedure might be expected to increase the numbers of children at younger ages who identify left and right hands of the experimenter when the experimenter faced the child.

Sorting of cups. Twelve cups were then placed on the table or bed in front of the child. These cups were made of different materials and differed in size, color, and shape. The cups were made of china, metal, or plastic, were large or small, and were red, green, blue, or white. All the cups were purchased at the local market, and were very familiar objects for every African child. Cups just like these were used for tea, porridge, and milk every day in every African home.

The children were asked to "put the cups into groups." No other clues as to how to form groups were given. Children were encouraged to try, and the instructions were repeated several times if necessary. For children who gave up, and could not do the sorting, or appeared not to understand, an example of a partial sorting by color was done by the experimenter to illustrate the task. The experimenter said that this was an example of one way only to make the groups. The children were then given another opportunity to sort the cups.

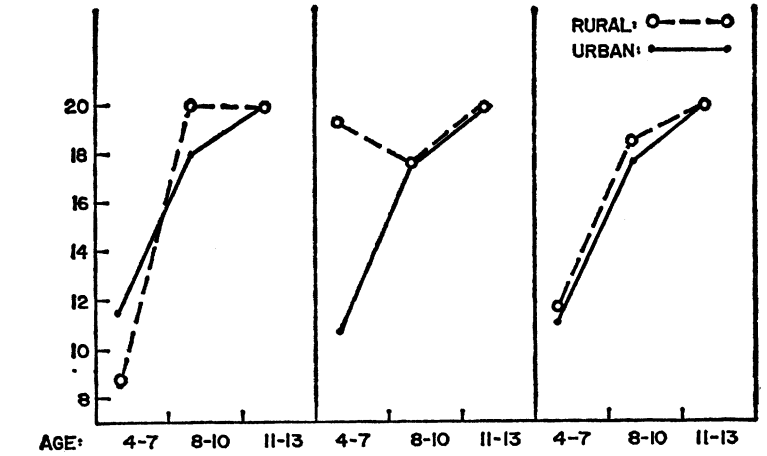
For those subjects who successfully sorted the cups the first time, the cups were remixed again on the table and the child was told to sort them again, "but a different way this time." For those children sorting a second way, the same instruction was done for a third and final sort.

After each sort done by the child, the experimenter asked, "why

did you make these groups like this." The answers of the child, and the groups the child actually formed for each sort the child completed were recorded.

Instruction-Specific Tasks

Tasks in the first series were straightforward tests of short-term memory, ability to count, and recall of digit strings. The rural and urban children did not differ in the highest number reached in counting; rural children, however, were higher in the number of strings of digits they were able to repeat after the experimenter. Figure 1 shows the highest number reached in counting for urban



Mean Scores	GIRLS			BOYS			TOTAL			N
RURAL	8.88	20.00	20.00	19.33	17.88	20.00	11.73	18.79	20.00	38
URBAN	11.60	18.00	20.00	10.88	17.86	20.00	11.15	17.88	20.00	26
										64
N	13	6	9	11	15	10	24	21	19	

Fig. 1. Highest number reached in counting to 20

and rural children, broken down by sex and age.[1] With the aberrant exception of some young rural boys who knew how to count

1. Data are presented in the form of graphical and percentage comparisons. The sample was purposely not randomly chosen, and for data such as free sorting, children are omitted who did not perform the tasks, or who merely copied the experimenter. For these reasons *T*-tests and one-way analyses of variance were performed to assist in interpretations, but are not reported. When differences by age, sex, or education are reported, they indicate strong trends in percentage differences.

to 20, age effects are overwhelmingly important in learning to count. There is a tendency for rural children to recall somewhat more digits than urban children. Older children recall significantly more strings than younger, and there are no sex differences in recall.

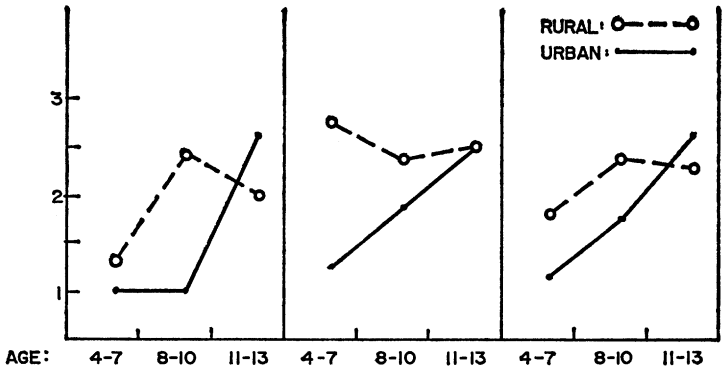
The next task was the test of handedness and reversibility of left and right. For both recognition of the child's own left and right, and for reversibility, there were no rural-urban differences. Table 2 shows the handedness task broken down into those children who knew their own left and right hands only, those who also knew the tester's left and right hands with the tester's back to the child, and those who knew the reversible left and right hands of the tester facing the child. Children over eight were more likely to recognize reversible left and right hands than younger children, although some younger children were surprisingly good at the task.

TABLE 2

KENYA CHILDREN WITH THREE DIFFERENT LEVELS OF RECOGNITION OF LEFT-RIGHT HANDEDNESS, BY RURAL AND URBAN RESIDENCE (N = 66)

	Rural		*Urban*		*Total*	
	N	%	*N*	%	*N*	%
Knows own left and right hands, or less	11	27.5	4	15.4	15	22.7
Knows tester's hands, with tester's back to child	5	12.5	8	30.8	13	19.7
Knows tester's hands, with tester facing child (reversibility)	24	60.0	14	53.8	38	57.6
Total	40	100	26	100	66	100

Each of these three tasks are instruction-specific; each child's score for these three tasks was summed and averaged. Figure 2 shows the distribution of these scores by age, sex, and urban or rural residence of the children. Children through age 10 from the country scored higher on these compliant, instruction-specific tasks than did city children. Children ages 11–13 are identical for boys, and reversed for girls. Rural children overall performed better than urban, older better than younger, and children with more education better than those with less (this factor is confounded with age). There are no strong sex differences. Rural scores are only modestly higher, and by early adolescence this dif-



Mean Scores	GIRLS			BOYS			TOTAL			N
RURAL	1.33	2.40	2.00	2.75	2.38	2.50	1.77	2.39	2.29	40
URBAN	1.00	1.00	2.67	1.25	1.86	2.50	1.15	1.75	2.60	26
N	14	6	9	12	15	10	26	21	19	66

FIG. 2. Overall averaged scores, instruction-specific tasks

ference disappears. Clearly, there is no *urban* advantage in performance.

EXPLORATORY-MANIPULATIVE TASKS

Free-sorting of familiar cups. The instruction-specific tasks are simple, straightforward, and do not require the child to interpret independently the tasks or make sense of an ambiguous task or instructions. The free sorting tasks require just such skills, and shows some interesting differences—and similarities—between rural and urban children. The most striking difference between the two groups of children occurred early in the sorting task. The rural children often could not make sense out of the task—they could not clearly understand what was expected of them when they were asked to "put these cups into groups," and were provided with no additional explicit instructions. These were the same rural children who up to that point had been functioning effectively in the test setting on other kinds of tasks. Table 3 shows the effects of this task-interpretation problem on free sorting: fourteen of the forty rural children, or 35%, did not form interpretable groups. Some of the children could not see what to do and just pushed the cups around on the table. Others asked if tea was going to be served—should they put the cups around the table for guests? Two

TABLE 3
NUMBER OF TIMES KENYA CHILDREN FREE-SORTED CUPS, BY URBAN OR RURAL LOCATION (N = 66)

	Rural		*Urban*		*Total*	
	N	%	*N*	%	*N*	%
Did not make any free sorts, even with prompting	14	35.0	0	0	14	21.2
Made only one free sort same as prompter's example[1]	10	25.0	0	0	10	15.2
Made one free sort	4	10.0	0	0	4	6.1
Made two free sorts	9	22.5	10	38.5	19	28.8
Made three free sorts	3	7.5	16	61.5	19	28.8
Total	40	100	26	100	66	100.1

[1] Estimated from field protocols.

children in fact *did* set the table for tea with the cups! The rural children were more adept when instructions were clear than when the ambiguous and unfamiliar free-sorting tasks were presented. No age, sex, or educational differences emerged in the number of sorts attempted.

Ten other rural children did produce a sorting, but one identical to the one presented as a prompt by the experimenter (green cups grouped together). These cases have been omitted from further analysis as a free-sort. These children were unable to generalize from the initial trial and illustration, and go on to sort in a new, novel way. In contrast, all twenty-six urban children tested were able to produce two or three different, interpretable sortings. City children seemed less nervous and disturbed by having an adult sit with them in a small room and ask questions, and they were more willing to *attempt* the task than were rural children.

These differences were similar to urban-rural differences observed from the beginning in ethnographic reports. Here are three short excerpts from field notes done two years before the experimental data were collected, in the same settings and while observing these same children.

(October 1969) I visited another rural matched homestead today to arrange for interviews. Lots of kids there—I saw seven or eight wandering around, and recognized ———— and ————. Children seem to be so deferential and meek, even act as if ill to some extent. Be-

haviors like hanging head, indirect gaze, keeping distance far more than Kariobangi kids, huddling closer to one another, more passive, less horseplay. Young kids carrying infants around, and *cooking* full meals after school, or hoeing or watching cattle, etc.!

(January 1970) Mrs. ———— complained bitterly again about ——— (7 year old city boy). Talks back to her, and even to father, roams around neighborhood without permission, constant horseplay and mock-fighting with ———— (4 year old sib, girl). ———— is in school, and mother says that he is learning too much Kiswahili and not enough Luluyia. Mother says that she is going back to rural area soon, and wants to bring the boy back with her so that he can help on the homestead doing chores.

(March 1970) We are in the middle of the urban behavior observations, and am continuing to see what seems like a combination of "pushiness" and talkativeness and alertness in urban kids compared to Kisa. Home observers note the same things in an irritated way—they say that Kariobangi observations are harder because kids are too "cheeky" with them and with parents and other kids. Sarah (home observer) told me that those kids wouldn't be getting away with that stuff in the country in a huffy tone of voice! Evidently, kids are coming up and nosing around with her clipboard and pencils, etc., and her warnings aren't stopping them!

The quality of city-country differences comes through in these notes, especially the comments of the field observers of the children. The parents' own perceptions parallel these comments; families recognize these cultural-situational differences clearly. They are reflected in the children's responses to the experimental tasks.

What kinds of sortings of cups did each group of children produce? There were four possibilities: a sorting along three pure, *single* dimensions (color, size, and material), and a sort using some mixture or combination of criteria (a mixed, multidimensional sort).[2] *Urban children were more likely than rural children to give mixed sorts,* not based on a single dimension. Rural children were somewhat more likely to produce pure, single-dimensional sorts (based on color, size, or material). It seems likely that many of the

2. Size is somewhat confounded by material and to a lesser extent by function. All the china cups were relatively small; a classification by size required a clear size discrimination in sorting into groups. If several criteria were used, the groupings were classed by the coder as "mixed." In addition, smaller china cups are only used for tea, and rarely by children. Thus the function of the cups is related to some extent to size.

city children (who were able to give mixed-groupings) might have given *no* free sortings in the country.

Many of the rural-urban studies of free-sorting and classification tasks reviewed earlier centered on the kinds of sortings made. For instance, were the sorting criteria, or reasons given for forming groups of objects, based on "simple-perceptual" criteria, or "complex-functional" criteria? Color, size and material are all in some sense perceptible and immediate for the child. Do rural and urban children use different perceptible criteria? Table 4 shows a summary of the data according to the sorting criterion used. In addition, rural children do seem to use color more than urban children (44% vs. 19%). Urban children (46%) seem to use size as a criterion more than do rural children (20%). But sorting by material —*also* an immediate, perceptible criterion—is equally likely for the two samples (rural 36%, urban 35%)!

TABLE 4
NUMBER OF FREE-SORTINGS OF CUPS BY SORTING CRITERIA, FOR KENYA CHILDREN, BY RURAL AND URBAN LOCATION

Sorting criteria	*Rural*		*Urban*		*Total*	
	N	%	*N*	%	*N*	%
Color	11	35.5	5	7.4	16	16.2
Size	5	16.1	12	17.6	17	17.2
Material	9	29.0	9	13.2	18	18.2
(Total pure groups)	(25)	(80.6)	(26)	(38.2)	(51)	(51.5)
Mixed groups	6	19.4	42	61.8	48	48.5
Total	31	100	68	100	99	100.1

An analysis of the *sequence* of free sorts showing the order in which these criteria were used, indicates that sortings by size of cups occurred proportionately more often on the third or final sort. Color and material were more likely, for both urban and rural samples, to occur on the first and second sorts. Rural children were less likely to make three sorts of the cups compared to urban children, and so the simple fact that rural children in most cases made only one or two sorts could account for the fact that rural children used size less than urban children. The urban-rural similarity of sequence of responses on the first and second sorts argues for this interpretation.

These data thus do not resolve the question as to whether urban children will use more complex, "abstract," or functional criteria

for sorting. All criteria for sorting cups involved some sort of perceptible criterion. The finding that urban children sorted more often, and gave more mixed responses to the sorting task than did rural children, seems to be a stronger effect than any color versus form differences in sorting criteria.

This hypothesis of perceptible-concrete categories being more characteristic of rural-traditional modes of thought than abstract-conceptual categories is a classic one in anthropology. The rural-urban data here suggest a somewhat different approach: "abstract-conceptual" criteria, especially those to be elicited in experimental situations, probably require the use of verbal descriptions not specific to the task; urban children are more likely to give such responses and act in exploratory-manipulative ways in such task situations regardless of the presence or absence of these more general modes of thought. Field research in both rural and urban settings with children in the rural-urban sample confirmed this effect often. For example, many of the children travel back and forth between city and country homes; here are two quotes from field notes, very early in working with this sample, which, upon rereading, illustrate urban-rural cultural differences.

(December 1968) Fantastic to get out of Nariobi and see the rural homes of the Kariobangi men! Visited ———— today, and had tea and a long talk and tour of his shamba (farm). ———— (4-year-old girl) was home with mother. . . . ———— hardly talked to me, helped serve tea, and sat in kitchen-sleeping hut much of the time. I asked her how she liked being home, and kidded her a little, but she averted her eyes and said nothing. I praised her ability to count and read some words to father, since I had seen her do these things in town, but think I blew it—she didn't say a thing, was too shy, embarrassed, scared, or something, to show off. Parents were silent. . . . Got to avoid putting people on spot like that since it obviously isn't done in the country.

(February 1969) Three new kids arrived from Kisa, and all will fit observational study requirements! I thought they were ill or something, since they didn't pick up on the teasing and verbal play of other kids they were staying with. I tried to joke with them *re* candy we were giving out, but they hung back. ———— (mother) said they were fine, just shy "because they have just come from the shamba, you know."

What at that point was attributed to illness or my faux pas were culturally acceptable behaviors in city and country settings. These patterns are transferred to experimental settings. Rural norms encourage deference and compliance and discourage verbal responsiveness to adults, especially strangers. "Abstract-conceptual" responses require such verbal facility. As Evans and Segall (1969) point out, rural (or unschooled) children are less likely to show such abstract responses for cultural reasons other than different modes of thought.

Verbal reasons for sortings of cups. The data presented thus far are based on the experimenter's recording of what groups were formed by the child. What of the *reasons verbalized* by the child for the groups he formed? Correctness or accuracy of reasons was judged based on whatever groups the child had formed; if the child verbalized accurately what he had in fact grouped, the child was given credit for a wholly correct response. *City and country children were similar in the number of wholly correct responses with rural children proportionately somewhat better.* Table 5 shows the data for wholly correct reasons broken down according to the number of sorts the child made. Although rural children made fewer sorts and fewer attempts than urban children, they

TABLE 5

PROPORTION OF WHOLLY CORRECT REASONS FOR FREE-SORTINGS OF CUPS TO NUMBER OF SORTINGS MADE FOR KENYA CHILDREN, BY URBAN OR RURAL LOCATION (N = 42)

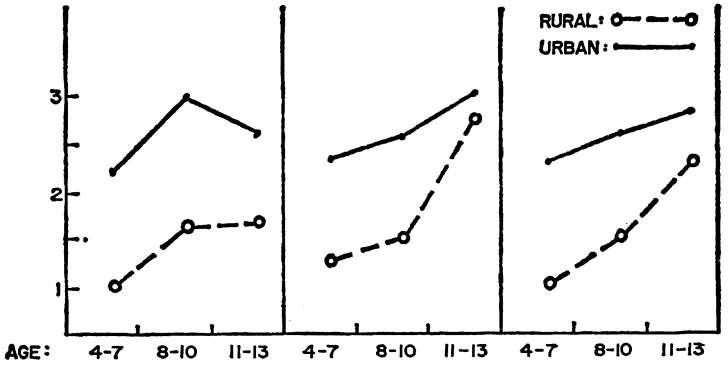
	Rural[1]		*Urban*		*Total*	
	N	%	*N*	%	*N*	%
No correct reasons given for one, two, or three sorts	3	18.8	8	30.8	11	26.2
One correct reason out of three sorts	0	0	6	23.1	6	14.3
One correct out of two sorts	2	12.5	4	15.4	6	14.3
Two correct out of three sorts	1	6.3	2	7.7	3	7.1
All correct for one, two or three sorts	10	62.5	6	23.1	16	38.1
Totals	16	100.1	26	100.1	42	100

[1] Excludes rural children making no sorts or copying experimenter's example.

were more likely to be correct in giving reasons for their sorts, if they made them.

Data were also analyzed including partially correct verbal descriptions of reasons for sortings. Partially correct reasons include mention of some of the criteria for sorting, but not all; or forming mixed groups but giving single-dimensional reasons for the sortings. *Urban children made more such mixed, partially correct verbal responses.* City children were more talkative during the experiment—and in the urban environment generally. They gave more responses and attempted more responses when they were not certain of the correct criteria. Rural children appeared to respond only if they clearly knew the answer and understood the task; otherwise they remained silent or did not attempt the sorting task.

The assertive tasks were summed together and an averaged score obtained for each child. This score includes the number of sorts attempted, and the number with correct and partially correct verbalized reasons. Figure 3 shows these data plotted by age and sex. Urban children clearly were more exploratory, verbal, and manipulative in free-sorting and free-recall tasks than were rural children, combining several kinds of scores. Boys were somewhat more assertive than girls; this difference occurs at the oldest age period only. Similarly, older boys were more assertive, leading to



Mean Scores	GIRLS			BOYS			TOTAL			N
RURAL	1.00	1.60	1.67	1.25	1.50	2.75	1.08	1.54	2.29	39
URBAN	2.20	3.00	2.67	2.38	2.57	3.00	2.31	2.63	2.80	26
N	13	6	9	12	15	10	25	21	19	65

FIG. 3. Overall averaged scores, exploratory-manipulative tasks

a slight trend toward improvement with age in this score. Better educated children score higher overall than less well educated.

CONCLUSION

These data provide some suggestive support for the hypothesis that urban and rural experience, as that experience differs in Kenya and in this particular sample, leads to differential responsiveness to ambiguous and novel experimental settings, especially where adults are involved. The hypothesis that urban exposure per se (partially controlling in this study for other confounding factors) produces general improvements in all tasks is not supported in this sample.

Cole and Scribner (1974) and Price-Williams (1975) have suggested some of the complexity and difficulty involved in moving from naturalistic observations of behavior in context to experimental and test situations needed to evaluate those same behaviors. One way to bridge the gap between these two kinds of data involves systematically varying the materials, test conditions, and subjects to see where and how the test information is analogous to or different from the natural setting. The present study illustrates the complexity of leaping from ethnographic observations of city and country environments and behaviors of children to tests and tasks done in some kind of controlled fashion that brings comparative, systematic techniques to bear on the problem of cognitive process. The link between the natural city and country situation and the presumed cognitive processes exhibited by children during the test depends on the interactions of natural and experimental settings. Future work in exploring rural-urban differences needs to specify just these linkages between behaviors in test settings, cognitive processes, and specific setting differences in the natural environment.

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