



## Cognitive Style in Rural and Urban Mexico<sup>1</sup>

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One of the central problems of underdeveloped countries in transition from a predominantly peasant to an industrialized economy lies in the human factor: the change from a peasant mentality to the mentality of an urban-industrial worker. Usually this problem is studied from the standpoint of education; first, literacy and then primary, technical, and higher education. However, increased knowledge and education is but one factor in the change that is necessary to enable the peasant to function adequately in an industrial society. Other and not less important psychological factors include character (motivational structure), values, and modes of thought or cognitive style.

In this study we consider two aspects of cognitive style in both a peasant village and in an industrialized sector of Mexico. The first aspect is the ability to code objects and concepts in terms of equivalence principles. The second is the predominant mode of moral reasoning. How are these aspects of cognitive style related to each other and to the change from peasant to industrial society?

It is our general hypothesis that cognitive style develops in childhood according to the demands of the culture, in terms of the mode of reasoning most functional for operating within the

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socio-economic conditions of the society or social class. This formulation considers cognitive style essentially in the way that FROMM treats social character [1949]. It sensitizes the investigator to consider at all times the interrelationships among the requirements of the society and the functions of cognition—in this case moral and abstract reasoning—for adapting to society.

A previous report compared developmental patterns for formulating differences and equivalencies for Mexican peasant children, Mexican urban children, and American urban children [MACCOBY and MODIANO, 1966]. That study suggested that divergent paths of development are followed by the urban and rural children. Developing from ages 8 to 12, urban children give up using perceptible attributes to solve the equivalence task and employ more efficient nominal and functional concepts. Village children, on the other hand, increase their use of perceptible attributes with age; while they are more likely to fail at equivalence, their difference judgements become finer.

In this report we concentrate on the characteristic styles of reasoning for the older children, aged 12 and 13, in relation to moral judgements and equivalence, as well as to their tendency to organize experience in terms of nominal, functional, or perceptual attributes. The major hypothesis is that equivalence reasoning characterizes the children of industrial workers and not peasant children, although both live within the same national culture.

Our main method of analysis will be to seek out cognitive types of syndromes of responses, to chart the types that are formed exclusively within one or the other sub-culture compared to those which exist in both (transitional types). Typal analysis supplements the developmental study, since the developmental averages sometimes indicate differences in quantity but not quality. Only by analyzing types is it possible to explore the reasoning underlying characteristic response patterns and to demonstrate that village children do not merely lag behind the faster developing city children.

### *Method*

The study is based on the testing of 19 boys and girls, ages 12 and 13, in a peasant village of some 800 inhabitants located approximately 65 miles south of Mexico City. The village is exclusively agricultural, specializing in sugar cane and rice<sup>1</sup>. We also

<sup>1</sup> A description of the village can be found in MACCOBY [1967], FROMM and MACCOBY (in press).



tested 49 boys and girls of the same ages in a housing development in Mexico City where the inhabitants are from the industrial sector of the economy. The urban youngsters included one complete sixth-grade class in the school located in the housing development (nine boys and ten girls). The rural youngsters included all the 12 to 13 year olds in a larger random sample of the village's child population which had been drawn for a wider battery of testing. Since the larger village sample was drawn without regard to school grade and since there was much age variation within each grade, the village sample varies considerably with respect to school grade.

The following tests were administered to the children:

1. *Differences and equivalences*<sup>1</sup>: We presented the following array of items to each child: banana, orange, bean (a common dietary item), meat, milk, water, air, fire, and stone. In the village the children were tested individually with the examiner writing down their responses verbatim; in the housing project the tests were administered to entire classes with the examiner reading the questions, which were printed on each answer page, and the children writing their responses. In each case the first two items were presented and the children were asked, "How are a banana and an orange similar?" (*Como se parecen?*). After they had answered, they were asked, "How is a bean different from a banana and an orange?" and then, "How are a bean, a banana, and an orange all alike?" The procedure continued in the same way, with the addition of each item, except that in the case of the last item, stone, only difference was requested.

Responses were scored both for differences and for equivalences in terms of five main criteria for grouping or differentiation:

(a) Perceptible: These included both intrinsic characteristics such as shape, size, color, texture; and extrinsic ones such as location in time and space.

(b) Functional: Intrinsic characteristics included what the item could do (*i.e.*, bananas grow); extrinsic characteristics included what could be done with the item (*i.e.*, we eat bananas).

(c) Moral or affective: These were seldom used criteria; they included such terms as good or bad, pretty or ugly.

(d) Nominal: These were abstract concepts often associated with superordinate classifications (*i.e.*, fruits, foods, solids).

(e) Decree: Rather than any type of attribute, fiat definitions were used (*i.e.*, "All these things are alike and this one is different").

Furthermore, in considering the use of functional attributes we looked at the degree of abstraction and added to the child's scoring the number of times he employed abstract attributes, either functional or nominal.

When a child reasons that he can eat bananas, he refers to a concrete operation, but when he says bananas and other foods make him grow or keep him alive or are necessary to life, he moves to a more inferential or formal level, to greater abstraction. Of course all verbal attributes are abstractions, but some refer to more "concrete" operations such as seeing, touching and tasting; we call these *concrete attributes*. By *abstract attributes* we mean a higher level of abstraction which includes nominal classes and induced or learned functions of objects which cannot be directly experienced.

As a reliability check on the food list, all the children were also tested on the following array of words: horse, cow, chicken, lion, snake, mosquito, man, tree, mountain. No significant differences in cognitive style as measured by the use of perceptible, functional, and nominal attributes appeared in the analyses of the two arrays.

2. *Moral judgements*: Five of PIAGET's pairs of stories [1932: 118-119] were administered. For each set the children were asked to indicate which protagonist was naughtier and why. The PIAGET stories included:

<sup>1</sup> Based on a test developed by OLVER and HORNSBY [1966].

(a) the boy who broke 15 glasses while obeying his mother and the boy who broke only one glass while trying to get some cookies;

(b) the boy who made a big ink stain while trying to help his father and the boy who made a small ink stain when playing with his father's pen;

(c) the girl who cut a big hole in her dress while trying to help her mother and the girl who cut a small hole when playing with the scissors;

(d) the boy who stole bread for a hungry friend and the girl who stole a little ribbon;

(e) the boy who took candy while his mother was away and the girl who let her friend's bird loose.

A sixth story was added to test whether the children considered it worse for a boy to steal and betray his friends or disobey his mother.

The responses were scored in terms of a four-point scale, from 1, which implied strict moral realism (the amount of damage or submissive obedience), to 4, reciprocity (full consideration of motive); 2 and 3 were intermediary steps. Since some village children were not given all six sets of stories (in order to shorten the larger battery) a child's final score was the sum of his item scores divided by the number of items. For a check on the reliability of the scoring the two authors independently scored 80 questionnaires ( $r = 0.74$ ).

The first three stories, all comparing amount of damage (moral realism) to consideration of motive, are highly correlated. The fourth, which contrasts stealing bread for a hungry friend with stealing a ribbon for oneself, correlates significantly with all the others. The next two, which probe for obedience against reciprocity, correlate significantly with one another. The last, which contrasts disobedience of mother with theft and the betrayal of friends, correlates least with the others, due to the Mexican sanctification of the mother role; disobeying her is generally considered one of the worst of crimes [MACCOBY, 1967]. Except for this item, in which about 80 % of the youngsters considered disobedience worse than betrayal, all the items correlated highly with the full scale score, the range being  $r = 0.66$  to  $r = 0.81$ .

3. *I.Q. and school achievement*: The children were administered RAVEN's Progressive Matrices [1958], which were scored according to Puerto Rican norms; this test proposes to examine observation and logical reasoning. It was given in order to make sure that we were studying differences in cognitive style and not differences in ability. School achievement was calculated, for the village children only, by multiplying their end-of-year academic average (one to ten) by the average age of children in their grade, and dividing by their own age; thus children who were younger than most of their classmates and had good grades would score higher, and those who were both older and had lower grades would score lower.

## Results

1. *Equivalence and difference*: A typal analysis [McQuitty, 1957, 1963] was performed upon the responses, using the criterion that each individual in a given type is more like some other individual in that type than like anyone else in the sample. In order to form the groups each youngster was scored for the number of times he used each of the attributes for differences as well as his number of successes at explaining differences; the same was done for the



equivalence responses. When a child used more than one attribute per judgement, each received credit. Each child's responses were then correlated with every other child's responses, and he was grouped with the other youngster with whom he correlated highest. For each of the groups or types thus formed, a prototype was selected; this was the child who, within the type, had the highest sum of correlation scores.

By examining these groups and the prototypes' patterns of responses, it is possible to chart empirical syndromes of cognitive style.

To simplify the analysis, the seven types that were found were collapsed into three groups characterized by concrete, concrete-abstract, and abstract reasoning (see table I). This "equivalence judgment" is justified both on the basis of content analysis and by the significant intercorrelations of the subtype prototypes.

Type I (Concrete) was made up of three subtypes. Two of them (including 37% of the village and 21% of city children) resemble the style of younger children. However, the largest subtype (including 32% of the village and 9% of the city children) reflects the distinctive cognitive style of peasant society. Children belonging to this type fail at equivalence judgments, but are accurate at formulating differences. Concrete criteria, both perceptual and functional, are highly favored. The children are concerned with the concrete reality of objects.

Their responses indicate that the children understand both formal and nominal concepts; they can classify using superordinate structures. But they do not choose to do so, when asked for simi-

Table I. Percent of rural and urban children, ages 12-13, within collapsed cognitive types

Type	% Rural children (N=19)	% Urban children (N=49)
Concrete (I, II, III)	69	30
Concrete-Abstract (IV)	11	19
Abstract (V, VI, VII)	5	32
Others	15	18
Total	100	100

larities, because similarity to them means almost exact perceptible likeness, such as between two oranges, not an orange and a banana. An example of this cognitive style is that of the girl who says of banana, orange, bean, and meat, "All of them can be eaten but they are not alike because meat is not round nor is it like a banana or bean"; she is capable of equivalence judgements but they do not satisfy her way of organizing experience.

The members of this group prefer isolating an object to describe its uniqueness in detail. Their differentiating statements are not only accurate but at times poetic: "Banana is like a horn; the orange, a ball; and the bean, a little heart; they are not alike."

The children in Type II (Concrete-Abstract) favor functional and nominal attributes for equivalence judgments, moving from concrete to abstract as the list becomes more difficult. They see the first items as foods or things that are eaten. When air is added they successfully make the jump from the concrete or formal to the abstract functional.

They are characterized by success at seeing both similarities and differences, favoring perceptible attributes for differentiation. They employ abstract, superordinate categories when the task demands it, but prefer to use concrete and perceptible attributes when they can relate to the "real object".

Type III (Abstract), includes a small subtype (with 5% of the village and 15% of the city children) of those who are mainly abstract, but lack consistency in their style. The largest sector of Type III is a subtype which includes urban children only (17% of the sample). This grouping is the one most characteristic of urban-industrial society. These children employ only abstract classification, nominal or functional, in equivalence judgements. At best they move from nominal to abstract functional attributes, such as, "All these are necessary for life", or "They keep the body functioning". At worst they become lost in formal concepts and lose flexibility. They sometimes fail to see differences because of their dependence on nominal classifications, and have lost the ability to see perceptible or concrete functional distinctions. They are the opposite of the children who are so impressed by the concreteness of objects that they reject the concept of equivalence; some are so preoccupied by formal superordinate groupings that they lose a sense of perceptible uniqueness. It is significant that this cognitive style is completely absent in the peasant village.



Placing the children into cognitive types helps to refine an understanding of urban-rural differences. The Concrete type, especially those who reject equivalence judgements, reflects a way of thinking distinct from the Abstract type, which includes only one child from the village. That some of the urban children show a "rural" style is perhaps explained by the fact that Mexico's cities are constantly being swelled by migration from the countryside and that the industrialized urban population retains transitional traces of a peasant world view. The rural sample is seen to concentrate in the Concrete type (almost 70 %) while the urban sample is more evenly distributed across the three types. Comparing the Concrete type against the others, urban-rural differences occur at beyond the 0.01 level of probability ( $\chi^2 = 8.08$ ;  $df = 1$ ).

2. *School achievement, I.Q., and cognitive style:* RAVEN's Progressive Matrices were used to obtain I.Q. scores because, while they do not tap verbal skills, they do correlate significantly with school achievement for the village sample ( $r = 0.50$ ,  $N = 41$ ,  $p < 0.01$ ). Correlations between I.Q.'s and success at equivalence, as well as the use of functional or nominal attributes, were all close to zero ( $0.1 > r < 0.01$ ,  $N = 42$ ). Correlations between school achievement and success at equivalence, as well as the use of functional or nominal attributes, were also close to zero ( $0.2 > r < 0.00$ ,  $N = 46$ ). This suggests that the reasoning ability necessary for equivalence tasks is not demanded by Mexican primary schools. In the past, rote learning and memorization were stressed; it has only been during the past few years that the Secretariat of Education has urged modernization of content and method [MODIANO, 1966].

3. *Moral judgement and cognitive style:* Both moral judgements and equivalence-difference reasoning reflect the influence of culture on modes of thought and are interrelated. For both of our samples the use of abstract attributes in the equivalence task are related to more reciprocal or less "realistic" and less authoritarian moral judgements. The moral judgement score is significantly correlated with both the use of functional-abstract attributes ( $r = 0.46$ ,  $N = 32$ ,  $p < 0.01$ ) and the use of nominal attributes ( $r = 0.32$ ,  $N = 51$ ,  $p < 0.05$ ).

In comparing the scale of moral judgements with the three types—Concrete, Concrete-Abstract, and Abstract—we would predict that children of the Concrete type would give "realistic" responses on the three sets of stories which compare concrete realism

with abstract motives. The data support this prediction, with 54 % of the Concrete type, 46 % of the Concrete-Abstract type, but only 19 % of the Abstract type using one or more "realistic" judgements ( $\chi^2 = 5.93$ ,  $df = 2$ ,  $p < 0.05$ ). Although, as KOHLBERG [1963] notes, any one story may have a particular meaning for a child or a culture, we were careful to accept "realistic" judgements that were supported by "realistic" reasoning. We might have used the full scale instead, but in fact the criteria used brought in only 10 % more children, who, although tending toward reciprocity on the full scale, still demonstrated "realistic" reasoning.

The moral judgement scale is more sensitive to age than are the variables of abstraction and equivalence, even within the village. Although at age 12 the majority of the village children are not reciprocal, the scale of reciprocity is correlated with age for the full village sample of children 6 to 16 ( $r = 0.46$ ,  $p < 0.01$ ). As with the equivalence-difference types, some lack of reciprocity may be due to slower development, but again, the analysis of responses indicates that this is not a sufficient explanation for all the variation. Even the slower development of reciprocity is probably due to the culture's traditional authoritarianism, which inhibits the ethic of reciprocity [MACCOBY, MODIANO and LANDER, 1964]. In the story which pits disobedience to the mother against reciprocity, we have seen that the culturally rooted dependence on the mother [MACCOBY, 1967] overwhelms all other considerations even for the urban children.

The moral judgement scale resembles the variables having to do with abstraction and equivalence in its lack of correlation with I.Q. ( $r = 0.00$ ,  $N = 74$ ) and school achievement ( $r = 0.06$ ,  $N = 53$ ). In the total village sample, maturity of moral judgement correlates with the RAVEN I.Q. at only 0.13 and with the STANFORD-BINET, at a surprising negative  $r$  of  $-0.47$ . This seemingly inexplicable negative correlation is due to the fact that the STANFORD-BINET I.Q. falls significantly with age in the village. The verbal skills tapped increasingly at older ages are not developed within village culture [MACCOBY and MODIANO, 1962]. Indeed, we consider traditional I.Q. tests inadequate for measuring the intellectual skills, including perception of people and of details, that characterize the most "intelligent" villagers. Although I.Q. and reciprocity are generally related within a developed, industrialized society [KOHLBERG, 1963], within peasant society some of the



smartest children respond to their own cultural necessities rather than to the demands of abstract logic.

As with the use of abstraction, a child can make reciprocal moral judgements in either a stereotyped manner or in a manner that takes account of the uniqueness of each situation. Thus reciprocity or "fairness" can be a substitute for thought. But some children, especially in the village, give "realistic" moral judgements backed up by intelligent reasoning. One child pointed out that the reason the girl who cut a larger hole in her dress was more guilty was that she had been very angry with her mother; unconscious motivation was implied. Another made it quite clear that a child should not be given credit for wanting to help if he were not competent or careful.

According to U.S. standards such responses are unfair, but U.S. society is both richer and more tolerant of childish errors. Mexican village children were not impressed by good intentions or carelessness when material loss was involved; in a society of economic subsistence such loss may be too serious a matter to allow the luxury of judging according to abstract motive. It is also possible that the children anticipated the attitudes of their parents and other authority figures with considerable accuracy. Their realistic responses do not necessarily reflect stereotyped thinking or lack of intelligence.

Before concluding that moral realism is related to cognitive style it is necessary to control for rural-urban differences; the results mentioned above may have merely reflected the concentration of villagers in the concrete type. When rural-urban origins are controlled the percentages of realistic children within each type remain almost identical; urban children who are more concrete are also more realistic (Chi-square = 5.07,  $df = 2$ ,  $p$  (one-tailed)  $< 0.05$ , see table II).

Table II. Relation between moral "realism" and cognitive type

Type	N		% "Realistic"		% Not "realistic"	
	total	urban	total	urban	total	urban
Concrete	26	13	54	62	46	38
Concrete-Abstract	11	9	45	44	55	56
Abstract	16	15	19	20	81	80

### Conclusions

In the developmental study [MACCOBY and MODIANO, 1966], different lines of development for urban and rural children were charted for reasoning on the similarities and differences task. In the present study syndromes of reasoning or cognitive types have been isolated for the 12 to 13 year olds. If we were to draw a continuum, at one extreme would be placed a group that is characteristic of the peasant society, the group highly concerned with perceptible attributes and the concrete reality of objects. These children are not interested in equivalence despite the fact that they can handle abstract concepts; but differentiation comes easily and naturally to them. At the other end of the continuum is a group which, in organizing experience as well as in moral reasoning concentrates on nominal concepts and abstract functional formulations of equivalences. This most abstract type includes no peasant children: It closely resembles the U.S. urban sample that we considered in the previous study [MACCOBY and MODIANO, 1966]. Neither end of the continuum appears to us as more mature than the other. Rather, they represent different cultures.

Differences in cognitive style make it difficult for peasants to adapt to the urban-industrial world, where functional and abstract attributes are in the forefront of thought. These differences also have implications for the development of intellectual abilities. Urban children, at best, are able to synthesize concepts with accuracy and intellectual power. They have learned the basis of theoretical thought, of integrating diverse concepts in terms of superordinate structures and abstract reasoning. They have learned to free themselves from the tyranny of the stimulus, its shape, color, and dominant perceptible qualities. But their style runs the risk of stereotyping and overly formal reasoning. Concepts are quickly put into boxes and the uniqueness of experience is lost. Moral judgements conform to an abstract theory that may become unrelated to deeper issues of compassion and understanding.

The findings suggest that some peasant children merely remain on a lower level of cognitive development. But this is not an adequate description of those who develop a cognitive style that with subtlety and profundity responds to the realities of peasant culture. The peasant child's concreteness ill-equips him to operate within a highly rationalized industrial society, but at the best he maintains



a deeper relatedness to his world, less alienated thought, and a poetry of language and experience that is expressed in peasant concepts of love [MACCOBY, 1967]. We have observed that in a small village, everyone knows the life history of practically everyone else. This knowledge, learned from childhood on, gives the villager a sense of relatedness and at-homeness, but it is untransferable.

### Summary

Within Mexico, a country in the process of industrialization, different cognitive styles characterize rural and urban youngsters at ages 12 to 13. Nineteen peasant and 49 urban children were tested for characteristic modes of reasoning in equivalence, difference, and moral judgements. The style most characteristic of peasant children included perceptible attributes, and a combination of "moral realism" and authoritarianism in moral judgements. Some urban children reasoned in this manner, but another style of reasoning, non-existent among the peasants, emerged. This "industrial type" is characterized by preference for abstract, formal attributes, facility in formulating equivalences, and a tendency toward moral reasoning based on reciprocity. The different styles reflect the demands of different Mexican sub-cultures and suggest one reason why peasants find it difficult to adapt to the demands of an industrialized society.

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