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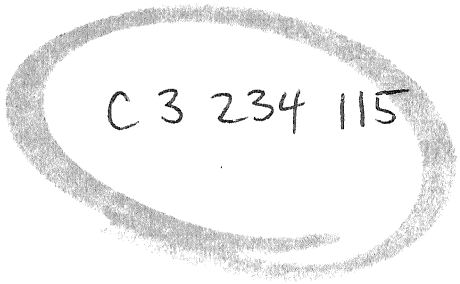

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NEXT ISSUE

The May/June issue will continue *Principal's* Ecology of Education series with a look at some people, places, and things that make up the educational environment.

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Contents

Culture, Cognition, and IQ Testing

MICHAEL COLE

AMONG the many virtues of experiencing a different cultural setting is the opportunity it provides for learning about yourself. Like the proverbial fish that discovers water when taken out of it, a few social scientists, mostly anthropologists, have placed themselves in a position to learn about themselves and their culture through exposure to situations far removed from their ordinary experience.

A beautiful description of one such encounter can be found in Laura Bohannan's book about her life among the Tiv of Northern Nigeria. As an earnest young anthropologist, Bohannan set about trying to "learn" Tiv culture. One of the lessons set for her by the village elders was to master the names of plants important to the Tiv as sources of food and medicine:

The woman and the boy returned, each with an armful of leaves. Kako spread about a dozen out on the ground before me and named them one by one; then the next dozen, and on and on. Some he told me were edible. By pointing at the farms to the North . . . and then back to the South, he informed me which were cultivated. . . .

By nine o'clock that morning, I had several pages of words, and my tongue was limp from unaccustomed twisting. . . . Reluctantly I began to name [the leaves]. With every word Kako became more dour . . . my pronunciation couldn't be that bad . . . the woman seemed incredulous. The little boy could stand it no longer. He snatched from me the leaf I was naming and handed me another. The order had been mixed, and not once had I put the right name to the right plant.[1]

There are many lessons to be learned from this anecdote. In this paper, I would like to concentrate on the notion that a person's intellectual competence can be assessed by observing what he does when confronted with tasks that "any child can cope with."

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Recent publications by Mr. Cole include *The New Mathematics and an Old Culture,* coauthored with John Gay, published by Holt, Rinehart and Winston in 1967, and *Culture and Cognition,* coauthored with Sylvia Scribner, published by John Wiley and Sons in 1974.

To an American reading Bohannan's narrative, there is special irony in her plight. We know her to be an intelligent and accomplished woman because she was able to go to Tiv-land, obtain a Ph.D., and write her book. After extensive experience, the elders in the village where Bohannan lived also came to appreciate her intellectual competence, although they were often perplexed by her ineptness in particular situations.

The incident with the leaves left them aghast at her stupidity because the Tiv could not appreciate the enormous amount of information she had been asked to assimilate. It was a part of the fabric of their everyday lives. It was the water in which they swam.

I would like to suggest that many youngsters entering our schools are faced with problems at least as difficult as Bohannan's. They enter school no less equipped intellectually to deal with the cultural environment from which they come, but by no means conversant with the fauna and flora of the classroom.

Unhappily, many do not enter an environment particularly well equipped to enculturate them. Part of the problem results from our failure to recognize that despite variations among them, by and large America's schools represent a culture that must be learned by all children. The systems of knowledge, belief, and value transmitted by American schools overlap to a very large extent with the home and neighborhood cultures of many children, often making it difficult to believe that anything like "culture learning" goes on at school. But it does. Because this is an article about testing, I want to consider problems that arise from a failure to appreciate cultural differences that influence performance on tests of both the achievement and ability varieties as these instruments are applied to measure children early in their school careers. But rather than repeat old arguments about biases in testing, I would like to describe one small area in which my colleagues and I have stumbled onto a hidden contribution of children's past experience in a test that presumes to measure a basic ability.

The example concerns tests of semantic development and those parts of IQ tests designed to assess the ability to classify, and this kind of example is quite familiar. For classification, the child is given a word pair (*plum-peach* is the first such item on the Wechsler Intelligence Scale for Children) and asked how they are alike. The scoring manual gives us explicit rules for allotting credit to different answers:

PLUM—PEACH

2 points—A response stating they are both fruits.

1 point—Both food . . . Both round (or similarly shaped) . . . Both have a skin (pits, juice, etc.) . . . Can them.

0 points—Good for you . . . Taste alike . . . Both small . . . Same kind of skin.[2]

Why are answers like "good for you" allotted no score at all? There are two answers to the question. First, as an empirical observation, it has been found that older children are more likely than younger ones to give the answers that receive higher scores, and at a specified age, children who give the better answers are more likely to do well in school. Second, there are *theoretical* rationales deriving from studies of age related changes in children's verbal behavior. Many studies have shown that when children of different ages are told to "say the first word that comes to mind" in response to stimulus words like peach, there is a regular change in the nature of responses that is age dependent. Young children (five or six years of age) are likely to respond as if they were fitting the word into a phrase or sentence. For example, we might observe the following responses to stimulus words: peach-fuzzy, run-home, or red-balloon. To be sure, we might also encounter sequences such as dog-cat or cow-milk, but the preponderance of young children's responses are of the type identified as phrase constructions.

Older children (eleven or twelve years of age) engage in relatively little phrase constructing. They are much more likely to produce the following responses: peach-pear, run-skip, or red-black.

This shift in the nature of children's verbal responses is widely believed to reflect a more mature language processing capacity, which has many counterparts in other areas of the child's intellectual behavior. Such parallels have led developmental theorists to formulate a series of stages or milestones of intellectual development, such as Jerome Bruner's idea that children first represent information

as part of an action, then as an image, and finally as a symbolic form. All of this seems so commonsensical that it is a little difficult to fault—until the fish comes out of the water.

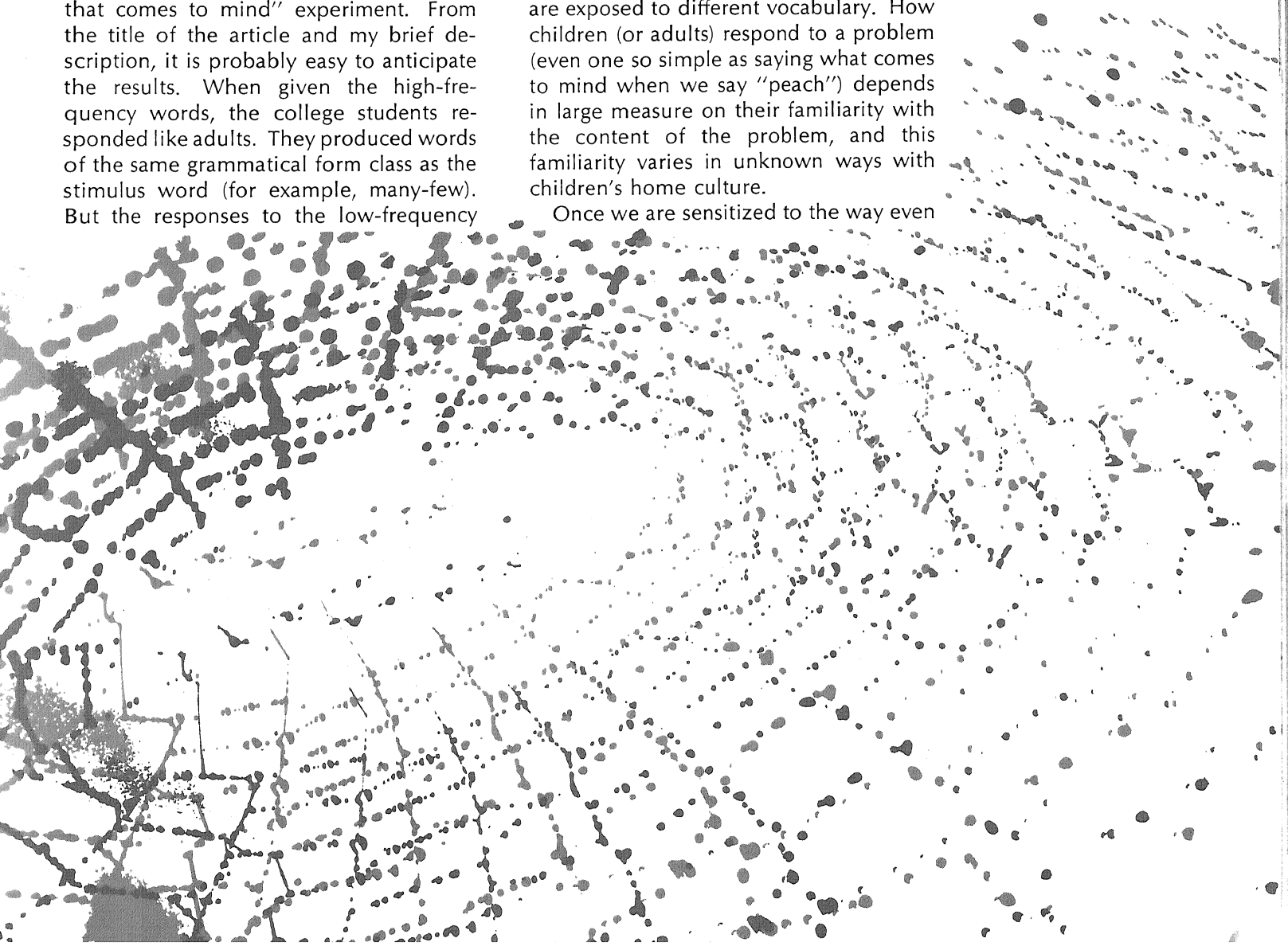
This experience occurred for me when I read an article about "the production of childlike associates in adults" in a very respectable scientific journal. The experiments reported in the article were the essence of simplicity. Using standardized norms of word frequency (taken from a variety of printed sources), the authors constructed two lists of words. One list was made up entirely of synonyms of the words in the other list. The only difference between the two lists was their frequency of occurrence on the norms. The first list was made up of very high-frequency words, the second list of low-frequency synonyms. Some samples from the two lists are: many/myriad; neat/fastidious; and clever/ingenious.

One group of college students was presented the first list, another group the second in a standard "say the first word that comes to mind" experiment. From the title of the article and my brief description, it is probably easy to anticipate the results. When given the high-frequency words, the college students responded like adults. They produced words of the same grammatical form class as the stimulus word (for example, many-few). But the responses to the low-frequency words were preponderantly childlike. They were words appropriate to the use of the stimulus word in a phrase (for example, myriad opportunities).

This article stimulated me to reconsider the rationale for assuming that word association studies measure semantic development as a property of individual children's level of mental development. If frequency of encountering a word controls the nature of adults' responses, wouldn't the same apply to children? And if the frequency principle applies to children, how can we use such materials to test ideas about intellectual development independent of experience? One thing about children of different ages that we can be pretty sure about is that older children have heard any particular word more often than their younger friends. If we are only testing children's age by a circuitous route, the exercise is rather fruitless.

What about children of the same age but of different family backgrounds? The same principle applies. We know that children from different subcultural groups are exposed to different vocabulary. How children (or adults) respond to a problem (even one so simple as saying what comes to mind when we say "peach") depends in large measure on their familiarity with the content of the problem, and this familiarity varies in unknown ways with children's home culture.

Once we are sensitized to the way even



simple mental operations depend on previous experience with the task, we are likely to be very skeptical when told that a test is "culture free" or "culture fair." The whole notion of culture free becomes very difficult to accept, because it means "independent of experience." It is extremely doubtful if we can discover any mental processes independent of experience.

Culture fair is an interesting notion to consider. A culture-fair test of semantic development would ensure that the materials used to elicit associative responses were equivalent in frequency of occurrence for each person being tested. No existing test of semantic development in particular or of mental ability in general has ever attempted to tailor its materials to major subcultural groups, let alone individuals.

Instead, the dominant strategy has been to attain culture fairness by making the test materials equally unfamiliar to everyone. The catch in this enterprise is in the word "equally." We simply have no way to determine if such equality has been achieved unless we know what the different groups know in the first place. But we don't know that or we could devise culture-fair tests. A pretty circle.

One of the distressing aspects of this problem is that it is difficult to identify. We have long known that asking inner-city children about gazebos and violoncellos is absurd. But when we see that the same problem arises again in more subtle form with peaches and pears, we begin to seriously doubt the efficacy of ability tests as anything more than a measure of what children have learned to do at the time of testing. We certainly don't want to leap to conclusions about their educability.

Lest it be thought that I have picked a special case, let me mention that virtually every time we look closely at a test, the same issues are almost certain to arise. Many recent studies have demonstrated the role of children's knowledge about words on tasks used to tap "higher order memory skills." Older children ordinarily recall more than younger ones, but not if we are careful to choose words that the younger children spontaneously organize in the way older children organize standard memory materials. Older children are unlikely to be fooled by changes in the configuration of a row of m & m's into thinking that the number of candies has changed. Young children are more easily misled, but not if we use few enough m & m's so that young children can count the smaller set as well as the older children can count the larger one.

As Laura Bohannan so aptly phrased the predicament of anyone facing an unfamiliar problem, "in each other's countries, where we do not understand, we become children again, who still have everything to learn." [3]

What implications can we draw from our predicament if we begin to operate on the assumption that for most children tests are largely or wholly measures of a child's past learning, not his or her general capacity?

First, we must acknowledge that no educational problems are solved by this decision. If Bohannan's future well-being had depended solely on her ability to learn about Nigerian plant life, she would have been in serious trouble. It is virtually certain that her past experience was an impediment to such learning; she "knew" she couldn't learn about leaves.

In a similar way, recognition that children are culturally different, not devoid of culture, can direct us toward new educational tasks, but such recognition provides no answers to the question of how to expedite second-culture learning.

The second implication of a decision to treat tests as measures of children's past experience should be to make us seek tests that will inform us more adequately about the children we want to teach. Based entirely on the culture of the school (because it is school performance that they are designed to predict), standardized tests tell us something about what part of the school culture children have learned that the teacher could build upon. Perhaps future test designers could aid teachers in their effort to understand their children by building as much cultural variability into their tests as possible. For the time being, however, teachers can expect little pedagogical help from standardized tests.

Everyone might be better off spending the time devising ways to discover what the children *do* know.

NOTES

1. Laura Bohannan, *Return to Laughter* (New York: American Museum of Natural History and Doubleday Publishing Co., 1964), pp. 15-16.
2. David Wechsler, *Wechsler Intelligence Scale for Children, Manual* (New York: Psychological Corporation, 1949), p. 67.
3. Bohannan, *Return to Laughter*, pp. 142-43.