

and linguistic informational networks. But how does an investigator systematically follow those networks of relationships from a first observation? How is the path followed so that the next steps taken (so that those observations) will lead further into the whole culture? How can the first data base, begun by that first noticed event unit, be expanded so as to point out next productive directions of the search for relationships?

When travelers in another society or—as is our interest—educators in an ethnically diverse school system notice an event which is unlike that which they have experienced in their own cultural context, they may puzzle at it, considering it simply as an interesting fragment of daily experience. Or, they may, over time, persist in looking for related events until by accumulation of those events, an outline of a previously unrecognized, cultural pattern begins to become apparent.

For example, one member of our research team was stopped for some twenty minutes in dense, six-lane traffic on a Beijing overpass. At a fork in this overpass, six lanes were packed with motionless cars. One vehicle on the extreme left moved several inches towards the researcher's car as a signal of intent to get into the right fork. However, the driver of the researcher's car inched up his vehicle to prevent this possibility. More interestingly, each of the Chinese passengers, by very slight nods and vocalizations, indicated a basic nonverbal assent for this action. After that observation, in numerous locations and events (in diverse allomorphic variations and contexts) the essence of this cultural unit was seen repeatedly: "only give way when the other (be it car, bike, or person) has definitely blocked the path". When we gave verbal descriptions of such events, Chinese associates would react knowingly, their comments revealing a recognition of the rule.

In a stratificational model of non-separable networks, there is little room to claim causes, effects, or origins; co-presence is all that can be suggested. And as cultural themes and dispositions interact in multiplicities of nonlinear ways, consequently, the tracing of the correlations of an observation is a baffling and difficult task.

What observational and notational strategies exist for both the extrapolation from such a nonverbal event, and for the identification of the cultural impetus to that fraction of behavior? It is most unlikely that the lines of closest connection of such an observed cultural fragment would lie in the time sequence in which the examples were experienced by our observer. So where to go next in a search of a pattern for this event? If this observation were considered to be a first thread to pursue into the cultural matrix, where would the exploration of that topic go next to get further grasp on the theme? Where into the broader domains of the society's meaning and behavior might such a starting observation lead? Could such a single observation lead to others? If so, which others? There is the problem. What would the logical proximity of a

subsequent observation be to the original one? And finally the larger question. Could the data eventually collected by disciplined observation and testing be extrapolated to a rule or cultural trait? If so, at what point in the data-gathering would that rule or trait be established. And how many noticings make the meaning?

As Lamb's work with language has demonstrated, tracing the relations and associations of a linguistic feature is complex. In addition to all those he records, pursuing the networks of connection of nonverbal units (such as the above example and those below) presents further problems.

3. The First Part of Our Observing

In addition to linguistic information, a culture's nonverbal knowledge, including the peoples' visual knowledge, is a network of inseparable interrelationships. So, too, any evidence, or any fragment of such a subsystem network could be pursued to a final ethnography of the entirety. A first observation could be used as the basis from which eventual conclusions about a culture were made. These problems of discovering the next logical steps in the construction of the "meaning" of a nonverbal unit is the issue with which we have wrestled. This problem began for us in the following simple, commonplace events:

Like many outsiders to a culture experiencing a puzzling difference in a way of life, one of our research group was struck by an event in which a Chinese associate insisted on taking his hands from the bicycle which he was riding down a hill and wildly sketching his name in the air with his finger. Puzzled by this insistence on writing the Chinese name which the visitor had already heard numerous times (and which he could easily pronounce and spell), the Westerner asked why — at such an inappropriate location and situation — this insistence on visual air writing.

The answer came immediately; there were six entirely different ways to write this bicyclist's name in Chinese. To this piece of information were added two other points, and these together suggested a connection that intrigued the observer:

1. Nearby was an inscription on a wall that was, according to the biker, presented in Mao's handwriting. Each character of this three foot high inscription, was crafted by an artisan whose employment was just this sort of task.
2. Furthermore, the badge that the Chinese was wearing was in Sun Yat Sen's script which the bicyclist could easily recognize and reproduce.

The Westerner puzzled about this set of statements related to an apparent Chinese attention to the complex, geometric nature of the 40,000-50,000 characters of the Chinese writing system. In the next days, this in-the-air or on-the-hand, sketched writing was noticed being used on the street, in offices and meeting halls. With only the barest of features — indeed, even from backward or sideways positions — these transient, geometric movements were immediately understood by the Chinese interactants. When and by what means was this visual acuity learned? What would young children’s abilities and visual enculturative experiences in such a cultural context be?

And increasingly arose the question: Where next would we go to observe other features of this theme? Where would the next level of relevant meaning show? How proxemically or logically close on the lines of connections from that first event was any next detail or component of such a relationship network? The steps in the logic of events follow.

4. Chronology of Related Observations

1. A university student, discussing the brilliance of a work of Chinese literature, spoke about the beauty of one of the written characters selected from some dozen possibilities by the classic writer. “I love the look of that character” the student said, and other students around the room nodded in agreement. Certainly, these shapes had for the Chinese a special importance that included both a sense of and interest in a type of architectural beauty that we westerners did not recognize. Increasingly we found evidence of special attitudes regarding these complex geometric characters. Attitudes not matched in Western experience.

Then other observations occurred, for example:

2. A Chinese commented that he found the shape of one character of a name card “very nice”. We subsequently showed informally the same name card to a total of 59 Chinese, asking each person which of the five characters were the most appealing. Each of the 59 promptly gave a response. Furthermore, to our surprise, when asked to rank the other four characters on the name card, again, each of the 59 Chinese (across different social levels) complied, frequently giving reasons for their individual choices. A similar question to similar people in the United States about the very same name (though on an English script card) always drew puzzled, curious responses. And never was a choice made. Such a question about the pleasantness of letters or words seemed ridiculous to all of the Westerners.

3. Discussing his young daughter, a Chinese father mentioned that he had used five criteria to select her name at birth. Among the criteria for the name-

choice was the character's shape itself. The father replied that the characters of the given name needed to "balance" the family name, i.e., to match the simplicity of the surname. Subsequently, we discussed this topic with many Chinese parents, and found frequently reported that they had indeed made a choice of names based on design — for example, simplicity, complexity, balance, etc. Sometimes at first our question was not understood. But then perhaps this type of decision about names is made as a judgment deep within the non-verbal awareness. In further studies we found more evidence of this.

For example, at one home the parents replied that shape factors had not been considered. Later in the evening, however, a page of the parents' original 48 choices was brought out — six rows of eight characters. Of these, one quarter had been eliminated with an X. When we asked why this one and that one had been crossed out, we were often told (and with some embarrassed laughter) that indeed the shapes had not fitted well. Other examples of this were observed with other families.

So in what ways are these events related? What was their proximity to a theme, a topic cluster like that of which the first bike-event was an example? Where exactly was each event that we had noticed located in the galaxial meaning universe? Did the "units" placed together point to an origin or source of this apparent focused Chinese interest and involvement in two-dimensional, geometric forms? We needed more information. But Lamb's model warned against assuming that the networks constituting meaning lay in any linear cause/effect association, or that a simple path to the heart of the meaning system would be found.

5. Associated Observation/Data Collection

We heard of school children memorizing and repeating aloud the 100 most common Chinese names one at a time while alternately visually focusing on the different characters for those names, for example, looking at 'Li' or 'Wang' and saying those names in unison as each of the array of different characters were pointed out by the teacher. Also, we had heard of the necessity of children and adults practicing looking up characters in a dictionary and telephone book by the character's geometric likenesses (and hence engaging in a type of architectural microspace memory experience). Would this practice in visualizing for the purpose of "looking up" words set in process skills that somewhere in the universe of Lambian interconnectedness would have an outcome?

We turned to a more formal type of data-gathering while continuing to record any chance observation opportunities:

1. We tested young children to estimate their visual memory and noticing-acuity concerning this narrow band of two dimensional shapes called characters. Now, one year on from the original observation, we were hypothesizing that accompanying Chinese attention to such a form of visual, two-dimensional detail, perhaps other dispositions, habits, etc., were to be found in a child's development. We first designed a simple reproduction memory test using five characters. These characters' meanings, we were assured, even the bright, first-grade children would certainly not know. Hence, these shapes, although recognized as "writing" to the children had no semantic meanings for them. They were simply graphical shapes, part of the seen world of everyday life — the visual semiotic. Each character, written boldly on separate pieces of 5" x 8" paper, was held up to the group for 10 seconds, one at a time, then removed. At a signal, the children reproduced the character. First, with these Grade 1, then younger children, and later with Western children of a much wider age range, some 250 children were tested.

The results were impressive. With speed and accuracy, in unexpected evenness (linear, horizontal straightness) and precision the Chinese Grade 1 children reproduced these shapes from memory. Some children were seen moving their bodies, embedding the shape's general form and direction of lines. The results suggested that the children had developed (through their six years of looking at their environment) sophisticated, microspace-noticing strategies. However, testing of Western children revealed a very different result indeed. We tried this test from Grades 1 and 2 up to Grade 6 in Australia and the United States. The results were uneven, large, disordered shapes scattered across the paper, and quite unlike the originals shown for the 10 seconds. When we asked Western adults to do this looking/memory test. The results were like those found among the grade school children — sometimes worse. Many of the Westerners reported using mnemonic strategies (e.g., "there's a roof in it") a method not mentioned by Chinese who seemed rather to see and know the shape as a whole.

A Chinese looking at the results of American adult efforts to reproduce these five shapes was astonished with what he regarded as the "chaos" of the results. We finally reminded him, with some defensive ego, that the Westerners were not accustomed to seeing such shapes. "But all they have to do is look and remember", he replied, stating an attitude and opinion echoed many times among the Chinese with whom we discussed this issue. The Chinese apparently thought any such shape was surely quite easily reproduced once it had been looked at.

Were there then, indeed, skills that the Chinese children had that came from frequent focused, two-dimensional, equally-spaced, visual semiotic, micro-noticing? Certainly children's enormous motor and perceptual efforts — to understand and to make the huge number of characters necessary for literacy —

would surely encourage different habits than would the experience of Western orthographic learning. When we tested other forms of this ability in younger ages in both Chinese and Western societies, we continued to find dramatic differences between the two populations. The Chinese children indeed were more practiced in that noticing skill. But did that practiced noticing produce — in a Whorfian-like form of association — other skills or behaviors and at earlier ages? What if very young Chinese and American children were not asked to remember and reproduce shapes, but rather were invited to create “writing”. We devised a second formal probe to explore this possibility.

2. Through native speaker representatives we told, in words and action, some two hundred children ranging in age from under two-years to five-years in seven different geographic areas of China to “pretend to write a letter” to their parents. After numerous trial runs of this probe and numerous fine-tuning efforts (which in themselves unexpectedly produced valuable data related to our interest), we finally designed precise instructions.

There were astonishing features to the results. At very young ages, even two years of age, some children produced tiny, linear, discrete, box-like shapes analogous to the character system. In some, we needed to enlarge the page on which the “writing” was done to be able to see the detail. This doubling and more of size was necessary in order to see completely the box-like shapes densely impacted and compacted in a tiny, narrow, linear band. Looking at these enlargements was astonishing.

And there was more to surprise us. Before we introduced a time limit on the task, some very young Chinese children worked on these small shapes for 15-20 minutes with amazing persistence and care. Western children’s productions tended to be quickly accomplished and were continuous, bigger, more oval-shaped, filling more of the page and rarely arranged linearly. To be able to appreciate completely these children’s results, we recorded every micro-feature of a character and produced a comprehensive and extensive grid of components that included each micro-variation of line, angle, and position. The resulting chart could be, therefore, used in later testing to evaluate these children’s approximations of characters and to illustrate the extent of their learning from environmental exposure.

3. To estimate the speed and accuracy of pre-kindergarten children’s noticing of micro-variations in characters, we gave a further test using three sets of 10 identical characters repeated five times with photocopied, and hence identical units. In each set there were two rows with one of the 10 characters having a minor difference, perhaps a tiny fragment — a dot or a line omitted from one. The test scores themselves, in comparison with those of Western children, indicated a more accurate noticing by the Chinese. But more interesting was the fact that many of the Chinese children’s “errors” indicated a highly-detailed attention to the most minute page print imperfections which we had not noticed

(for example, a spot from the photocopy screen on the reprinted test page). Again, kindergartners' evidence of disciplined, lengthy perusal of the test shapes was astonishing.

4. We next set out to test children's awareness of a single component of writing. We speculated that much younger children than those we had tested, for example 1½–2 years old (whose linguistic level was such that they might not understand what to do if we verbally asked them to "write a letter"), would also have learned basic architectural aspects. We selected the correct "upright position" and designed a test that could be used in China and the West. Again, after numerous mis-starts and subsequent adjustments, we presented Chinese and Western children, one at a time, with three sets of different shapes, pictures, characters, and letters placed on 2" x 2", laminated surfaces. The sets were of (i) pictures of commonplace objects, (ii) characters, and (iii) letters. The pictures were the first group scattered on the table. These we used so as to give the preverbal children the idea of the game, namely turning the pictures right side up. Each set of 5 cards was, one at a time, scattered on a table to be placed "right side up". We showed what to do with the pictures. As we did, we role played, stating, for example, "Now this pig should stand upright", "Oh, this chair is upside-down! That's not right!" We found indeed that the Chinese knew significantly better than the Westerners what side was the correct side up for characters (and the Western children were better at orienting the letters). Hence, at an even earlier awareness of this two-dimensional system which is seen in the general daily life environment, there was identifiable learning. We took this result as a further indication of the early visual learning that goes on in human growth and, importantly, as an area of potential future, visual semiotic research.

5. We next gave kindergarten to second-grade children a copying test that included (a) the original five unfamiliar characters used in the first visual-memory test, (b) five English alphabet letters, and (c) five invented shapes. These graphical forms, placed together in one line on the board, were displayed in the front of the classroom. The children were given as long as they liked to copy these. There were in this test's results only 42 slight malformations and only one reversal in the more than 2,800 copies. However, an unexpected result, and one of considerable interest to us, was the following: In one class of 52 children aged 6 years, when we returned in the afternoon to pursue other tests, the teacher proposed that we see how much of the morning's task the class still remembered. An interesting proposal, we thought.

The children were given the same sized piece of paper on which in the morning they had copied the three sets of shapes. They were asked to write the same unfamiliar Chinese characters which they had earlier directly copied from the board now erased. Although we expected minimal success in this task, in fact, there was more like a 90 percent recall and only 28 very slight deviations

