

## Integration and Inference: Two Visual Literary Skills

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It is reassuring when what is predicted from psychological theory is actually seen to occur in the classroom. In recent years, I have been involved in research into visual learning and thinking which has allowed me to draw some conclusions about the kinds of processing skills a person must master in order to be visually literate. At the same time, I have had the opportunity to work with teachers and their students in the areas of viewing, visual literacy, and television. This article discusses two cognitive processes that appear to be fundamental to visual literacy in general and to television viewing, and which are also interesting because they do not function consistently in children of different ages. In other words, these processes illustrate ways in which visual skills are linked to children's general cognitive development. I call these skills "Integration" and "Inference".

Integration is a mental process by means of which the viewer interprets the elements within a picture as belonging together. In a picture of a house, for example, the doors, windows, chimney and roof are perceived as all belonging to one object. They are integrated by the viewer to form a single concept "house" rather than being seen as a collection of single isolated concepts. Inference is a process that leads the viewer to a meaning of the picture beyond the obvious concept it represents. For example, if the house is a large one, surrounded by trees, with a Rolls in the driveway, the viewer might well infer that the owner is wealthy. Or if the picture includes a barn and a tractor, the viewer would infer that the owner is a farmer. Often, of course, inference and integration are not easily separable. When we look at a snapshot of people all posing for the camera, we tend to integrate them into a single group, whom we then infer know each other, possibly being members of the same family. Here it is difficult to tell what is integration and what is inference. Nor is making the distinction particularly productive. However, psychological research suggests that they are separate processes, and observing children suggests that they do develop to some degree independent of each other.

The implication of this for visual literacy is that younger children do not possess fully developed skills for integrating information in pictures, and for drawing inferences from them. They develop these skills as they grow older, and should be given opportunities in visual literacy programs for learning and applying them. Although a child's cognitive

development cannot be significantly accelerated, these skills do not necessarily develop as fully as they might on their own, meaning that instruction in their use is important.

While not formally documented in any way, I have collected numerous examples of the development of integration and inference skills from observing children directly or on videotape. The following "scenarios" are taken from these observations.

*Groups of grade three children are doing a picture interpretation exercise using pictures from magazines. One group, working with the teacher, is studying a photograph in National Geographic showing a man in a smock and turban ferrying three cows across a lake on a raft. There are snow-capped mountains in the background. The teacher is attempting to have the children make inferences about the picture, and asks: "Could this picture*

*...these processes illustrate ways in which visual skills are linked to children's general cognitive development."*

*have been taken in Alberta?" "Yes," comes the reply. "Why?" "Because in Alberta there are lakes, boats, cows, men and mountains." The instructor then asks the children to look more carefully at the man in the boat. After some discussion, the group agrees that he is not from Alberta, and certainly not wearing the clothes that Alberta cowboys wear. "So," asks the instructor, "could the picture have been taken in Alberta?" "Yes," the children persist, "because in Alberta there are lakes, boats, mountains, cows and people."*

By adult standards, these children have misinterpreted the picture. You can detect some obvious adult logic in the thread of the teacher's probing and questioning. "Is the man from Alberta? If not, then the picture was probably not taken in Alberta." That, however, is adult logic. The children's reasoning is influenced by their lack of integration of the elements in the picture. They do not see that the context is very likely related to the man in the picture. Though in this sense incomplete, the reasoning system that leads them to conclude that the

picture could have been taken in Alberta is just as logical and sound as an adult's reasoning system. It is different, relying on associative processes involving familiar experiences. But it is just as good a system as that of the instructor. To think of it as inferior is unjustified and, on the face of it, terribly patronizing.

*"The children's reasoning is influenced by their lack of integration of the elements in the picture."*

*A seven-year-old girl is looking at a study print depicting a little boy sitting in a dentist's chair. The dentist is showing him some x-rays. "What are these?" asks her mother, pointing to the x-rays. The girl hesitates. "X-rays of other people's teeth or of his teeth?" she asks.*

This child is clearly in a transitional stage, and is hesitant and unsure in integrating the elements in the picture. An eleven-year-old, as an adult would, looked at the same picture and stated right off that the dentist was showing the boy x-rays of his teeth. However, the girl does not make this association, and fails to integrate the two elements. Again, though, she is not "wrong". They could be x-rays of someone else's teeth. But as a result of experience with dentists, adults make the integration, while she does not.

Similar developmental trends and differences from adult logic are evident when children are asked to draw inferences from pictures. It has generally been observed that children tend to pay attention to the literal content of the picture, and often have difficulty drawing inferences that require more abstract and (again) adult reasoning.

*A group of grade six students is studying advertisements in a magazine. The page is open at an advertisement for Buick cars. A Buick is parked on a deserted beach. The sun is setting. A man and a woman, in the middle distance, are walking hand-in-hand away from us. To the left is a cottage among some trees, with a light burning on the porch. The children have figured out that the car and the cottage belong to the couple, who are obviously boyfriend and girlfriend, and probably married. They also know, from earlier discussion about commercials, that the purpose of the picture is to sell Buicks. The teacher asks, "Why did the person who made this advertisement take a picture of the car on the beach by the cottage?" The children have difficulty answering this. After a while, one of them suggests, "The people must have got*

*to the beach somehow. They probably drove there in the car."*

Here, the child is making an inference. However, the teacher was clearly probing for something more subtle (and adult). Again, the child was not wrong. But since the object of the exercise was to sensitise the children to certain of the techniques of advertising, the teacher was hoping for inferences to do with the status of the people on the beach, their romantic attachment to each other, and so on. "The kind of people who own Buicks own cottages by the sea, are young, romantic, successful and attractive." This is something an adult tends to infer, but a child does not.

*"...visual skills do not necessarily develop naturally to their fullest potential."*

These examples illustrate the point that both for integration and inference-drawing, younger children think differently from adults. But since television programs and commercials, even those aimed at children, are made by adults, thinking like adults, portions of the intended message are likely to be overlooked or interpreted differently than the way they were intended to be. Some might argue that this is a good thing, providing children with a natural defense mechanism against the more subtle and insidious techniques of television advertising. But to leave it at that defeats the whole purpose of education in visual literacy. Children are best served if they are given the opportunity to develop and apply cognitive skills that will lead them to interpret visual messages as they were intended to be interpreted, so that they can also develop judgmental skills that will lead to an accurate and valid appraisal of the messages that they have interpreted. A large portion of the effort in educating children to be visually literate must therefore go to training in integration and inferencing.

It was stated earlier that cognitive development cannot be greatly accelerated. It should therefore not be the aim of visual literacy programs to speed up development. However, visual skills do not necessarily develop naturally to their fullest potential. They need to be taught, just as reading skills do. So when children have reached the appropriate level of cognitive "readiness", they can begin to learn the syntax of visual messages that require developed integration and inferencing skills to be understood. The

best way I have found to help children develop these skills is by no means original, so I will just mention, and not analyze the method in any depth.

To begin with, the method is inductive. From their examination of pictures, whether still or moving, children are encouraged to derive general principles of visual design by means of which visual communicators get people to integrate elements in pictures in particular ways, and to draw particular inferences. These are gathered from the children, and tabulated on the blackboard (or elsewhere) for the children to refer to as they study more pictures. In this way, most design principles are identified as a result of a group effort. We start looking at slides as a whole class. Then we break up into small groups for the study of magazine pictures (frequently advertisements). We then move on to looking at television commercials as a whole class.

When doing these activities, care is taken to make sure that all the important aspects of visual design are illustrated. Pictures have to be selected to include some that use grouping and layout to get the message across (to develop integration skills). Others should illustrate how inferences are drawn from such things as camera angle (psychological dominance), color (warm or cold feelings), facial expressions (mood), cultural symbols (wedding rings, styles of dress), stereotypes (the "ideal" family with two children, one of each sex), youth, beauty, and material things (society's ideals), and so on. You will be amazed at how readily children catch on to many of these, and how quickly they begin to make quite subtle interpretations.

The foregoing has not dealt specifically with television. This is because the development of integration and inferencing skills are in large part precursors to critical television viewing. I have found it easier to work with children using still pictures than with television, because often the discussions I have with them and their teachers require constant reference to a single picture. However, once the children are capable of integrating the elements of pictures and of drawing inferences from them, they will be well equipped to do the same with television. On the other hand, without ability in these two skills, they risk misinterpreting the intentions of the adults who have produced what they are viewing. This can only be to their detriment, preventing them from developing the ability to critique what they see in terms of their own needs and values.