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FILMIC COMMUNICATION AND COMPLEX LEARNING. WORKING PAPER NO. 4.

BY- PRYLUCK, CALVIN

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RESEARCH AND EXPERIENCE SHOW THAT FILM IS MORE EFFECTIVE IN FACTUAL LEARNING AND IN PERCEPTUAL MOTOR LEARNING THAN IN TEACHING RATIONAL ACTIVITIES. LANGUAGE AND FILM HAVE DIFFERENT STRUCTURES WHICH DETERMINE THEIR FUNCTIONS IN INSTRUCTIONAL SETTINGS. ESSENTIALLY, PICTURES ARE INDUCTIVE WHILE LANGUAGE IS DEDUCTIVE. LANGUAGE IS CAPABLE OF NUMBERLESS EXPLICIT STATEMENTS OF RELATIONSHIP. FILMIC EXPERIENCE, THOUGH NOT EQUIVALENT TO ACTUAL EXPERIENCE, CAN CONVEY AN UNDERSTANDING OF A PARTICULAR PHENOMENON BEYOND THE SCOPE OF LANGUAGE. IT CAN FACILITATE COGNITIVE AND AFFECTIVE PROCESSES IN CIRCUMSTANCES OF INADEQUATE INTERNAL CODING ABILITY OF STUDENTS. SINCE VISUAL IMAGES ARE INDUCTIVE, THE SUCCESS OR FAILURE OF FILMIC COMMUNICATION DEPENDS ON THE INFERENTIAL RELATIONSHIP BETWEEN SOUND AND IMAGES, AND UPON THE AUDIENCE ABILITY FOR MAKING INFERENCES. IN EDUCATIONAL FILMS THE POTENTIAL FOR A VIEWER MAKING HIS OWN DISCOVERIES AND REACHING HIS OWN CONCLUSIONS IS OFTEN VITIATED BY THE ADDITION OF A FULLY CONCEPTUALIZED NARRATION. EDUCATIONAL FILMS SHOULD SHOW AN EXPERIENCE RATHER THAN TELL ABOUT IT. (JO)

Working Paper No. 4: FILMIC COMMUNICATION AND COMPLEX LEARNING (1)

by Calvin Pryluck, Audio Visual Center, Purdue University

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Extensive research and practical experience has demonstrated to the level of "high certainty" that films are effective in perceptual motor learning and factual learning. The research evidence is much less certain on the capacity of film to teach "those rational activities unique to man -- conceptualization, critical thinking, generalizations, etc." (Hoban, 1960, pp. 103-105). As part of Hoban's et cetera, we might add other activities unique to man--those generally subsumed under the rubric of affect. Thus in terms of hard evidence, we know relatively little about the effect of filmic communication on those activities that should properly be the central concern of educators.

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Relating cause and effect in historical events is a tricky business, but it may be useful to speculate a bit on the reasons why we know a great deal about the relationship between filmic communication and fairly simple instructional tasks and relatively little about how film might contribute to the more important instructional events.

One obvious answer is that simple instructional tasks are easier to deal with, given the state of theory. The argument, if I were prepared to make it in any detail, would suggest that earlier stimulus-response theories did not seem to be able to encompass complex filmic communication, yet these were the theories which underlay much of the research. As a consequence, what has passed for research on film or television bears little resemblance to these media as they are generally understood. I am not a psychologist and shall not go further in this particular argument, except to suggest that some of the newer cognitive theories such as those of Bruner, Guilford, Reitman, or Berlyne may be broad enough to encompass filmic communication. Whether this is really the case is not important to our present discussion.

(By the way, filmic communication is shorthand for those instructional techniques which have the characteristics of communication through motion pictures, that is, controlled exposure of sequenced images, often in fixed relationship to speech, music, and natural sound. In this sense, television is also filmic communication as are filmstrips and multi-media presentations.)

Whatever the reason, the dominant trend in film research over the years has used traditional classroom instruction as a standard. The major question generated by this approach is something like "Is medium X better than medium Y" where you can fill in any of the newer or traditional instructional techniques for X and Y.

One way or another, this question was asked for over forty years through the fifties and early sixties (Hoban and vanOrmer, 1950; Reid and MacLennan, 1967). By now this question has been pretty much discredited and is only occasionally asked, except in what might be called administrative research, where there is a need to convince local administrators that their investment in television or some such device was worthwhile.

The results of much of the previous research can be summed up by a judgment that was based on evidence from the first major study of instructional films in 1924. Rulon in his 1933 Harvard dissertation noted that "Film technique fails to exhibit any superiority over teaching techniques which it merely duplicates" (1933, p.4). Looking back over thirty-five years, I know of no evidence to contradict this judgment.

It is clearly established that filmic communication can effectively teach most of the things that are traditionally conceived of as instruction. I would like to suggest, and shall argue for the rest of this paper, that filmic communication is capable of achieving instructional objectives that are often difficult of attainment through traditional techniques. I would like to propose as a general formulation a way of looking at filmic communication which may prove to be a useful orientation for either research or instructional application.

It is well understood that man advanced to his present state by use of, what Bruner (1964) called, systems of implementation that can extend man's ability to cope with environment; hammers, knives, guns, etc. are obvious examples. These systems of implementation enable us to cope with our physical environment by extending our physical capacity or by adding a specialized

technique that we may bring to bear on the environment. A bicycle enables us to make more efficient use of the movement of our feet; an internal combustion engine opens completely new possibilities of locomotion.

In somewhat similar fashion, the systems of implementation that enlarge our capacity to conceptually manipulate our environment either extend our reach, or change the ways in which we may reach. When we use filmic communication to transmit a lecture or a panel we are using it as an electronic megaphone; we are simply extending our reach. My concern here will be with filmic communication as an instrument which changes the ways in which we can reach. We will be looking at some of the ways in which film as a symbol system constrains or facilitates the attainment of instructional objectives.

In this terminology, language generally, and speech and writing specifically, are also symbol systems.(2) The research strategy I have been using is a comparative one; language and film have different structures which have consequences for the functions they might perform in instructional settings. I am interested in these differences and their consequences. I am not here thinking of the simple-minded differences which result in statements like "motion pictures are good for showing things that move." As a matter of fact, I sometimes think that motion per se may be a relatively minor characteristic. Much work has been done on the structure and function of language, but practically nothing comparable for film, and certainly nothing that is consonant with the common understanding of film. This is, for me, work in progress and everything I say should be understood as tentative, subject to empirical verification. We can start by contrasting the simplest units in the two symbol systems. The shot in filmic communication, in the

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(2) The comparison between film and language is elaborated in fuller detail in Pryluck (1968)

most general case, is a mechanically processed set of pictures presented in series of indeterminate length; as a pictorial representation the referent of a shot is direct and specific--it is a picture of something. The word, by contrast, has a generalized referent and an arbitrary form. From these basic contrasts arise a number of divergences in the way in which they may be used.

The most basic consequence of these differences is the way in which each is sequenced. Through logical analysis it can be shown that the abstraction of a word tends to be specified by syntax and the specificity of a shot tends to be generalized by juxtaposition in editing. The functional consequence of this elaboration appears to be that sequencing in language facilitates subtle distinctions in conceptualization while in filmic communication sequencing facilitates conceptualization derived from the experiential nature of shots. In this sense, film seems to be structurally inductive, while language appears to be structurally deductive.

Another way of saying this would be that there appears to be a difference in logical structure between language and film which is reflected in the sequencing of basic units. One central difference in the two symbol systems would appear to be in the specification of content relationships between basic units. Numberous subtle relationships can be fixed and specified through the manipulation of various linguistic characteristics, many of which do not have filmic parallels. The possibility of numberless explicit statements of relationship is, I suggest, one factor that makes language the profound instrument it is. The general absence of devices to signal relationships between shots has important consequences for the nature of filmic communication.

In film the relationship between succeeding shots is direct and imperative based on the immediacy of the juxtaposition between shots. When two pieces of film are stuck together they are separated only by a substantially invisible marker, the splice; whereas in language there are all kinds of structure words indicating relationships. There is direct and immediate contact between the content of a sequence edited for maximal juxtapositional contact. Juxtaposition, it is widely believed, lies at the heart of filmic communication. Succeeding shots are seen as qualifying each other; each juxtaposition is assumed to facilitate associations not obviously present in either element in the pair.

While juxtapositional relationships are assumed in other symbol systems (for instance, poetry), they take on greater importance in filmic communication due to the structural constraint that the viewer of a film cannot be told what are the relationships between shots. The viewer can of course be told through the narration; but that is a different problem which we will come to. The experiences depicted and their juxtaposition may be direct and specific, but the conceptual relationships between shots are indirect and inferential. When a shot of a young man is followed by a shot of an old man there are very specific and direct significations; their relationship, however, must be inferred.

The existence of such inferential relationships is the underlying assumption of film editing and perhaps of all filmic communication, but the mechanism governing filmic juxtaposition is only dimly and intuitively understood. The juxtaposition of a shot of a man and a shot of a child playing do not simply show us what a man looks like compared to a child (although this is often the way sequences are conceived in pedestrian films). Depending on a number of variables, different inferences are

possible from such a combination of shots. In short, whether the gross subject matter seems appropriate is only one consideration in putting together a set of pictures. Succeeding shots cannot be indifferently related to each other; the inference that arises from the juxtaposition must always be considered.

These matters become thoroughly confounded with the inclusion of a sound accompaniment. Before going further, it is important to understand something of the mechanics of film production; in the most general case of filmic communication, motion pictures, the components are normally manipulated independently in four separate tracks: a picture (or action) track, a speech (or narration, or dialogue) track, a music track, and a sound effects track. They have a literal independent existence in the formative stages of film making. Only at the end of the process are these components transferred into single unit for transmission; the separate tracks are incorporated into a composite print which is the print customarily projected for public viewing.

Until that point is reached, these four tracks can be independently manipulated so that in addition to juxtapositional relationships within a track we have juxtapositional relationships between tracks. We don't understand either type of juxtapositional relationship with any scientific clarity, but it is assumed by experienced film editors that inferences can be controlled by shifts in juxtaposition between sound and picture of even a few frames (one-twelfth to one-sixth of a second).

There is a further problem: what is the relationship between deductive language presentations and inductive filmic presentations when presented simultaneously in juxtaposition. I can't prove it yet, but I would hazard the guess that we are wasting our money if we insist on using deductive language on the sound track. This arises from the suspicion that anything said deductively on the track would dominate the picture; the language would impose interpretations on the picture quite apart from whether the picture itself supported such interpretation. Even if this weren't true in every case, I would suggest, that if the juxtaposition assumption makes any sense at all, there would be distortion of either language or picture when they are presented in careless juxtaposition. In short, it cannot be assumed that words or pictures when juxtaposed retain their intended meanings.

Where does this all leave us? We have, what I take to be a fact, that pictures are essentially inductive, specific instances of an experience whose meaning is generalized by sequencing. On the other hand we have language which is essentially deductive. However, not all language must be ed ^ uctive; it is obviously possible to make inductive statements, if we define induction in terms of specificity.

In any event, we do have in filmic communication a symbol system, or a coding device, which differs systematically from language; it is possible to code experience in filmic communication differently from the coding of the same experience using only language. This is so not only because of the obvious fact that we are coding with two different types of stimuli

in filmic communication. The important point is the interaction between these stimuli. This interaction is, to me, the fundamental problem of filmic communication in instruction or research.

The real contribution of filmic communication to education, it seems, depends on juxtapositional relationships within the tracks and between the tracks, that is, controlled interaction between picture and picture, and picture and sound. When these components function in a symbiotic fashion we are beginning to tap the potential of filmic coding to effect unique cognitive results.

(By way of disclaimer, the following discussion of "cognitive processes" or "internal coding" or suchlike ideas is not intended as statements of the nature of these processes. Where necessary the existence of certain processes will be postulated as a minimum requirement for explaining what appears to happen in filmic communication. Precisely how it happens internally will have to be examined by others more qualified than I am. However, as I suggested earlier, some of the explanations of internal processes just do not seem to fit the observed facts of filmic communication and on that ground must be rejected for my purposes.)

There are scattered bits of evidence that suggest that filmic coding can sometimes supplement internal coding processes for students, thereby facilitating their learning of otherwise difficult-for-them skills and concepts. As a general formulation I would suggest that filmic communication becomes a significant addition to the instructional process to the extent that it uniquely constrains or facilitates cognitive processes relative to the information presented.

First a negative example of this process. Kanner and Rosenstein (1960) hypothesized that color television would be more effective than monochromatic television in teaching a task involving color coding of electronic components. After nonsignificant results, the authors suggested that the verbal labels for colors had been adequate substitutes for the actual colors. This result is consonant with the earlier, more general, findings of Brown and Lenneberg (1954) that the colors which subjects could name were the colors most easily remembered in a learning task. For most individuals, it seems, the verbal labels for common colors are adequately coded to be capable of easy retrieval without nonverbal support quite apart from whether color was a relevant cue in the learning situation.

Hovland (1949) reported a datum that could be interpreted as an instance where nonverbal support did contribute to superior learning. The study compared the effects of a commentator and documentary radio presentation. The versions did not differ in overall effect or credibility. In the dramatic version a point concerning relative amounts of bombing damage was made by maintaining a bombing sound effect for fifteen seconds to represent the amount of bombing against Germany and the same sound effect for one second to represent the amount of bombing against Japan. On the question concerning this point, there was a large difference in favor or the dramatic presentation. I would suggest, on meager evidence, that the nonverbal support was responsible for this result.

In another study by Hovland (1949) a comparison of film and filmstrip resulted in no overall difference in instructional effectiveness. On two points, however, the presentations did differ significantly. To illustrate the use of the distance scale in map reading, the film

animated the scale to cover the measured distance, while the filmstrip used a strip of paper to transfer the distance. The results on this item favored the filmstrip. Movement was also used to illustrate the measurement of contour intervals. In this case the camera moved from horizontal to vertical "to show how differences in elevation of terrain are projected onto a map in the form of contour lines" (p.129). The results on this item favored the film.

It is possible to take these four items as examples of successful and unsuccessful illustrations. They are that. Why they were successful or unsuccessful is still an open question. I am suggesting that in the successful examples the movement (or sound effects) did some of the coding for certain individuals, enough individuals to have made a significant difference in the group scores. The successful use of movement in the teaching the idea of contour lines, I suggest, was successful because it conveyed an idea which isn't terribly easy to explain with words alone. It is something like trying to explain with words alone the shape of a spiral staircase. In both cases we are dealing with phenomena that are inherently continuous and which may get "wrenched out of shape" by chopping them up into discrete verbal units. Roshal's (1949) classic study of knot-tying can be interpreted in the same way. He showed that demonstrating a psychomotor skill on film from the viewpoint of performance was more effective than a demonstration as normally seen by learners. It can be suggested that the coding transformation from the observer's point of view to performer's point of view could be made by some individuals and not others, but that this transformation could be

made for the latter by means of an appropriately chosen point of view in the film. The material thus comes to the individual partially pre-coded.

This idea of transformations can be elaborated a bit more by suggesting that filmic communication can facilitate cognitive and affective processes in circumstances of inadequate coding ability; the inadequacy can be either individual or general. In cases where the individual possesses the requisites for appropriate linguistic coding, then it is clear that language does the job better, faster, more efficiently. If I know what red is, I don't need an example when the word is used. However, where there are no words possessed by the individual or the community to describe an experience, filmic communication can sometimes depict it and possibly help "put a name to it." On the other hand, even if I could learn the words without the experience, I haven't learned much. Even blind men can be taught the names of colors.

A word of warning, though: As anyone who has suffered through other people's vacation home movies can tell you, there is a vast difference between having the experience and depicting it on film. Despite this, many educators, who it must be presumed have viewed home movies, still insist on speaking about educational films as "a window on the world," without realizing that this particular window is made of distorting glass which shapes the view of the world, well or badly, depending on the ways in which the images are chosen, framed, sequenced, and upon the choice and sequence of words, sound, and music to accompany these images. When all of these things are done properly the film can convey an understanding of particular phenomena that is out of the reach of textbooks and lectures.

Some films can develop ineffable concepts which in turn can serve as heuristic and integrative frameworks for the internal coding of further date. I suspect that the process here is not terribly much different from the transformation involved in teaching knot-tying from the point of view of performance, although obviously more complicated.

A pair of examples may make some of these points clearer. Both examples are drawn from widely used educational films portraying the life of a ten year old boy in a Negro ghetto. The excerpts are each approximately the same length: something less than two minutes. The first excerpt is from Portrait of a Disadvantaged Child: Tommy Knight (Vision Associates 1965). The sequence starts with Tommy attempting to answer the teacher's questions.

FILM EXCERPT

Tommy Knight is seen in a classroom trying to talk about farm animals--and not succeeding. The next scene shows Tommy in a playground with his friends and succeeding in communicating perfectly well. The narrator tells us:

> How can Tommy talk about a farm? What is a farm? For Tommy a farm is light years away from the streets, the houses, and the narrow limits of the world he knows. Tommy can't talk about a farm. And so he is labeled: Tommy is inarticulate and incapable of expressing even the simplest idea. While this may be a true picture of his situation in school it is not a true picture of Tommy.
>
> In a more familiar and comfortable environment, he expresses himself without any trouble at all and he makes himself understood.
>
> With his own group and on his own terms, Tommy is far from inarticulate; he knows how to speak and how to use words to communicate ideas, but he doesn't know how to do it on the school's terms and in the language and imagery of the strange and remote middle class world.

I haven't selected the worst part of the worst film I could find. It is I think a fair example of a widely used educational film form. In some ways it's a pretty good film, but the real business of the film is transacted by the narration. The fully conceptualized narration imposed on the pictures limits the coding transformations to the one indicated by the language. I suggest that substantially the same effect is possible by using just the narration. There is an additional, perhaps more negative, consequence of this kind of film which I will come to after the next example.

This excerpt is from The Quiet One (Meyers, 1948). As the sequence starts, the youngster has suffered a disappointment.

FILM EXCERPT

The narrator comments:

> He has failed again. The baby in him is desperate to be comforted.

We see a sideqalk tunnel in Central Park. Vaguely in the shadows we can see a woman and child; the child is upset and crys: "Mamma, mamma, mamma...." A well-dressed white woman and her pre-school daughter come into the light from the tunnel. The child is comforted by the mother. Donald passes by, looks back, and mimics the child: Mamma, mamma, mamma...." As he enters the tunnel Donald's cry echoes: "Mamma, mamma, mamma...." Donald is next seen walking down a darkened apartment hallway, the cry dimishes, becomes more plaintive: "Mamma, mamma, mamma...." He approaches a door and we hear him shout through the door: "Mamma". We see a shaft of light as the door opens. Donald's face lights up, anxious to please. We see a close-up of a woman's nervous hands; we see Donald again, crest-fallen this time. Then we see the mother and boy together; he is biting his finger nails. We hear the mother's grudging invitation: "Well, come on in." They pass through a kitchen where a pot is seen steaming on the stove. Only then does the narrator comment:

> It smells like home, but it's no home for you.

Immediately we hear a man's angry voice: "You coming back in here or not?" The mother leaves; we hear an argument between the man and the woman. Donald is left alone.

In contrast to the fully conceptualized narration in Tommy Knight, the narration of The Quiet One is a conceptual framework guiding the viewer gently through the images. The images are permitted to carry a good bit of the communication load; there is no easy way in which words alone could have done the same job. Perhaps the words of a Baldwin or a Claude Brown might; but even here I'm not sure that words alone could convey the youngster's almost palpable distress. Did you notice in the echoing of "Mamma, mamma, mamma..." how each time they repeated there was a different quality to the sound? First a mocking of the white child, then a plaintive infant's cry, then a straight-forward calling through the door. Words alone could not have conveyed this. The paralinguistic quality of this kind of speech is an integral part of filmic communication and is one of the things that permits it to reach in new ways.

It is a large but, I believe, a logically defensible leap between the transformations in the Hovland examples cited earlier and what I see as a similar effect in the example from The Quiet One. In the former case what might be called the symbolic inadequacy was individual, in the latter case there is a general symbolic inadequacy. There are no words that can adequately encompass the experience.

As a working film maker and sometime theorist, I would suggest that what I have been calling transformations is one of the most exciting, if perhaps most difficult, areas for either research or utilization. On the one hand it is closest to the essence of filmic communication; on the other hand, it deals with a problem that is central to the whole educational enterprise--the development of the learner's ability to learn for himself from the environment.

We have already argued that through its unique coding techniques, film can contrive experiences that offer opportunities that life itself cannot offer; to expand on this point a bit, an accumulation of detail or the juxtaposition of contrasting images may impart substance to a verbally presented concept; different images sizes can be manipulated for emphasis; words and sound can be presented in controlled contrast with visual images. How do these filmic techniques work? I don't know, but I've got some guesses, and there are a few of us trying to find out. That these techniques do appear to work seems quite clear. One other thing seems quite clear: Since visual images are essentially inductive, the success or failure of filmic communication depends on the inferential relationships between sounds, images, sequences of sound and images, and upon the audiences ability to make the inference.

It is precisely this aspect of film--this ordering of detail so that the audience is led to inferential leaps--which has been under-used and scarcely studied in educational film. There is, too often, a retreat into the simplest mode, verbal exposition. Interactions between sound and picture typically follow the most direct, expository form. There are few inferential relationships between word and image or between succeeding images; visual inference is often overwhelmed by verbalization. In many educational films the potential for a viewer reaching his own conclusion is vitiated by the addition of a fully conceptualized narration rather than a conceptual framework which enables the viewer to make his own discoveries and put his own labels on what he is seeing. And now you see why I use Tommy Knight as an example; it has the potential for this kind of inference, but the people who made it just couldn't leave it alone. They apparently had to make sure that even the dolts got the point, regardless of the consequences of this kind of spoon-feeding.

If we are really serious about trying to get students to think for themselves we may have to be willing to let the dolts take their chances (although I personally think that the kids understand this kind of thing better than we do). We will have to actively look for ways to develop this inferential capacity, not only with language but with all the other kinds of information people normally make use of. Appropriately structured filmic communications, I suggest, can contribute to the attainment of this objective, while at the same time contributing to the students' store of knowledge. When filmic communication is used in its own terms, not as a substitute for the classroom presentation, it is inherently inductive. When we use filmic communication in this way we are forcing students to make their own inferences; the kinds of films I am talking about <u>show</u> an experience rather than <u>tell</u> about it. Cinematic principles, when well used, guide audiences to their own understanding of experience.

When you get right down to it, isn't that really the whole point to what we're trying to do in education?

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