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Paul Messaris
University of Pennsylvania

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Solomon: Interaction of Media, Cognition, and Learning

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Reviewed by Paul Messaris
University of Pennsylvania

A considerable amount of theory and some research about movies and television have borrowed ideas from linguistics. Among them is the well-known notion, usually associated with Whorf, that the thought processes of habitual users of a particular language are shaped by the way in which the vocabulary and syntax of that language carve up and organize experience. Many writers have speculated about the possibility that an analogous process may characterize the relationship between visual (and other) media and their users. Some of Marshall McLuhan's ideas were probably the most prominent academic variants of this kind of hypothesis, but a notion of this sort is also present in the widespread public assumption that the disjunctive editing patterns of American commercial television have lowered attention spans and otherwise degraded the capacity for coherent thought among children brought up with the medium. A test of part of this assumption is one of the many interesting details in Gavriel Salomon's comprehensive exploration of this general approach to visual media. Unlike much previous writing which has flirted with this approach, Salomon's book is marvelously systematic and precise, both in its theoretical sections and in the empirical work which flows from them. The book is a model of how experiment and theory are supposed to complement each other, and for this reason, in addition to the importance of its subject, it will be of great value to any reader with a disciplined interest in visual communication.

Salomon addresses himself most directly to people doing research on uses of media for educational/instructional purposes. He argues that most of this research is insufficiently grounded in a general theory that would predict which aspects of media should affect learning, what kinds of conditions should facilitate or inhibit these effects, and what kinds of learning should occur given a particular set of conditions. His own work, as represented in this book, is based on the notion that the critical feature of any medium is the particular symbol system to which its technology gives rise. In other words, what counts, with respect to the use of a medium for education/instruction, is the particular set of syntactic and semantic codes that characterizes the messages of any particular medium. The nature of these codes, in turn, should serve as an indicator of the conditions influencing a medium's effectiveness as a learning resource. These are, according to Salomon, (a) the

learner's initial level of skill with codes of this kind and (b) the appropriateness of these codes to the cognitive task at hand. Finally, this concern with codes leads Salomon to a distinction between two kinds of learning: on the one hand, the acquisition of code-independent knowledge about various features of the environment; and, on the other, the cultivation of code-specific cognitive skills with which to operate upon the environment. (Here and elsewhere, Salomon draws heavily on the work of Goodman, Olson, and Gardner.) The degree to which either kind of learning occurs through a particular medium should depend on the interaction between its symbol system, the nature of the task, and the viewer's aptitude.

These points—and the many complications and elaborations through which Salomon weaves them into the theoretical armature of his work—are tested through a series of experiments and field studies. The bulk of these are concerned with the second kind of learning distinguished above, that is, with the acquisition of cognitive skills through the use of a medium characterized by a particular symbol system. The two media of most concern to Salomon in his investigation of this Whorf-like problem are television and film. An example of this empirical side of Salomon's work is an experiment testing the effects of three different kinds of visual "syntax": the alternation, through zooming in and out, between long shot and selected close-ups; direct cutting back and forth between long shot and close-ups; or one continuous long shot. The particular cognitive skill of concern to this experiment was the ability to record detail in a complex visual field ("cue-attendance"). Subjects were pretested on this skill and were then trained in one of three ways: (a) through the use of films which zoomed in and out of details in a single painting, while the subjects recorded what they saw; (b) through slide sequences that had the effect of cutting back and forth between various close-ups and the painting in full view, while once again the subjects recorded detail; and (c) through single slides of the whole painting without any close-ups but with the same task on the part of the subjects. Posttests revealed an interesting interaction between one's initial level of skill and the kind of training one received. Subjects with low initial scores profitted more from the film with the zoom-ins and zoom-outs. Subjects with high initial scores, however, profitted more from the single, uninterrupted slide showings. Salomon argues that in the first case the film is providing viewers with an explicit model of the desired information-processing operations, which less-skilled viewers can easily assimilate. Subjects who were already skilled, on the other hand, had much less to learn from this condition but did experience an increase in skill through the challenge of the version in which no overt model was provided. In other words, as Salomon's theory had predicted, the cultivation of cognitive skills through the use of a particular kind of syntax depends on the user's initial position with regard to these skills.

Although in this and other related experiments Salomon has generated impressive evidence on the capacity of media syntaxes to influence their users' cognitive patterns, his own theory also predicts that the actual occurrence of such a process outside the experimental situation depends on the nature of users' involvement with various media. To the extent that Salomon's experiments may have generated uncommonly active involvement with each medium's presentational style, these experiments probably exaggerate the degree to which any comparable influence of a medium's syntax on users' thought processes may occur in the course of the more typical — i.e., largely "recreational" — uses of film and television. For this and other obvious reasons, the studies with which Salomon concludes the empirical segments of this book were conducted in more "natural" situations, with less or no manipulation of viewers' media use and with longer time periods over which effects could accumulate. It is in one of these studies that Salomon tests a version of the popular assumption of a relationship between the spasmodic narrative style of most American television and lack of continuity of children's thought processes. His finding, in a long-term experiment in which children watched either "Sesame Street" or nature/adventure films (presumably containing longer narrative threads), was that a steady diet of the former led to reduced perseverance in the performance of routine, repetitive tasks. More generally, however, Salomon's nonexperimental research on the relationship between long-term television-viewing patterns and cognitive skills does not support the notion that "television syntax" affects viewers' cognitive skills in the case of children using the medium primarily as "light entertainment" — i.e., with no motivation to process its messages "in depth."

This last finding can be read in more than one way. Salomon uses it to conclude that, while it can be demonstrated that the symbol system of a medium has the capacity to affect cognitive skills under appropriate circumstances, the ordinary circumstances under which one views television and film are probably not appropriate in that sense. However, this may be a prematurely cautious conclusion. While the specific cognitive skills that Salomon tested in his latter set of studies may not have been affected by habitual television viewing, it would seem reasonable to assume that there may be other, as yet untested, skills for which effects could have been found. In fact, it is not at all clear — to this reviewer, at least — why the particular battery of skill tests used in these latter studies were the most appropriate measures of the kinds of skills we would expect to be cultivated by watching television. Furthermore, it is not even clear what cognitive skills one should in fact expect to be cultivatable by the medium. In Salomon's earlier, experimental work, the syntactic properties of the media used were lightly controlled, and the measured skills were closely matched to these syntactic properties. No corresponding tight-

ness of matching occurs in the later studies. There is no systematic analysis of the syntax of American television and, consequently, no precise indication of why the kinds of skills Salomon has chosen to measure are good analogs of this syntax.

Furthermore, the very assumption — tacit in Salomon's work — that American television can meaningfully be treated as presenting its audience with a uniform syntax is highly questionable, no matter how restricted to routine commercial fare this audience's viewing habits may be. Communicational modes like television, which are characterized by a very large iconic or analogic component, need not — and, typically, do not — have as coercive a syntax as language proper or any other mode whose coding is mostly or totally arbitrary. Television shooting and editing styles are almost inevitably variable, no matter how high the proportion of hacks may be in the professional production system. Consequently, the medium as a whole presents the viewer with a multiplicity of syntaxes, and it is only at the most abstract — and, probably, uninvestigable — level that one can speak of a common syntax of moving visual images. It follows, then, that any "real-world" research of the kind proposed by Salomon must be more precise in its focus: The syntactic patterns of coherent classes of television content must be analyzed systematically; the cognitive processes that might go along with these patterns must be deduced rigorously only after such an analysis has been performed; and the specification of the appropriate test population must be made according to a strict accounting for viewing patterns. It is more than likely, of course, that even these conditions would not uncover any effects of television syntax on cognitive processes. The detachment of ordinary viewing (if "viewing" is, in fact, an appropriate word at all for what most television audiences do) may, as Salomon argues, preclude such effects. It may also be that there is too much syntactic pluralism in the mediated visual environment of most viewers to allow for a proper "real-world" test of the theory. Nevertheless, such a test must await the fulfillment of these conditions.

However, the absence of this kind of test from Salomon's work is only a minor flaw when the full scope of his achievement in this book is taken into account. Through disciplined theoretical synthesis and deft empirical application, Salomon has managed to resuscitate an area of media scholarship which sloppy speculation had almost completely robbed of credibility. He has given this area a sound conceptual basis, developed useful methodological tools for research in it, and, in both these respects, pointed the way to many promising possibilities for future investigators.