

Salomon G. *Interaction of media, cognition, and learning.*

San Francisco, CA: Jossey-Bass, 1979. 282 p.

[Hebrew University, Jerusalem, Israel and Stanford University, CA]

Exposure to the different "languages" or symbol systems of the media can affect the mastery of specific cognitive skills and capabilities. This general hypothesis is based on the assumption that there is some isomorphism between internal modes of representation and culture's symbol systems and that external, communicational symbol systems can be internalized to serve as "mental tools." Possible psychological mechanisms, particularly activation and supplantation of skills, that can account for such cognitive effects are discussed in light of different theories. Empirical evidence from three experiments is presented showing that such effects are possible and that they strongly interact with individual differences. [The *SSCI*® indicates that this book has been cited in over 110 publications.]

Gavriel Salomon  
School of Education  
Tel-Aviv University  
Ramat-Aviv  
69978 Tel-Aviv  
Israel

and  
Department of Communication  
University of Arizona  
Tucson, AZ 85721

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I was a foreign student at Stanford University in 1966-1968. That was not an easy task. Having come from afar (Israel), I failed not only to obtain answers to the problems faced by a newcomer to the American university system, but I did not even know what questions to ask. Paradoxically, this confusion, or rather, naïveté, turned out to be a blessing in disguise: I was encouraged by such great teachers as L.J. Cronbach, R.E. Snow, N. Maccoby, and W. Schramm to develop my own multidisciplinary course of studies. This, then, included such areas as educational and social psychology, communication, research methodology, and the arts.

This ostensibly well-balanced education gradually turned blessed confusion into bothersome uncertainty (the latter becoming the topic of my dissertation). It was one thing to feel at home in a number of fields, but quite another to find a focus for my interests. I needed a linchpin to relate and interconnect information theories, information processing, attitude change, processes of communication, the cultivation of thought processes, the arts, and more. I remember a long conversation in a parking lot with a close friend and colleague of mine, David Feldman, trying

to explain my uncertainty and growing feeling of loss. I mentioned my interests and my previous works, particularly my MA thesis about the symbol systems of cartography and how children come to master them. And suddenly the solution emerged, like a figure out of a foggy background: media have different "languages" and so do our cognitive representations. Could the two be related? Could our thinking come to reflect the symbolic vehicles of communication used by, say, television? Could we come to think in terms of television's symbolic forms? If so, what are the educational implications?

Suddenly everything fell into place, and I could hardly contain my excitement; Whorf, Bruner, McLuhan, Miller, and Berlyne all found their places in my gradually emerging scheme. There was content, and there were symbolic forms; there was the acquisition of knowledge, and there was the internalization—in a Vygotskian sense—of media's codes to turn them into "mental tools." I started to design experiments, the results of which turned out to be the first to have any bearing on McLuhan's arguments. I was elated: the findings were much too systematic to be attributed to good luck, and they suggested that media affected minds not so much through content as through symbolic carriers. But I was also quite apprehensive: I had the power to affect minds! I concluded that the theory and the findings should be shared with others; let my colleagues judge the quality and moral ethics of my endeavor.

A paper published in 1972<sup>1</sup> was the beginning of all these processes; it led to an ongoing research program. That program finally led to a larger theory presented in *Interaction of Media, Cognition, and Learning*, which received the first award of the Association for Educational Communication and Technology in 1981. This highly cited book guided my own work and that of others for a number of years after its publication. The book seems to be of renewed relevance nowadays when computer-afforded activities are considered. The question of cultural symbol systems and thought processes is likely to be with us for quite a while longer.<sup>2</sup> Indeed, a new question, having emerged from those dealt with in the cited book, pertains to whether individuals can come to internalize the "thinking" patterns of intelligent computer programs. I have called this "artificial intelligence in reverse."<sup>3</sup> If computers can simulate human thinking, can humans come to simulate (i.e., internalize) computer "thinking"? Recent studies conducted by my students and me suggest that this possibility is a viable one, thus expanding the theory in the cited book to apply also to the world of computers and the cultivation of thinking skills.

1. Salomon G. Can we affect cognitive skills through visual media? An hypothesis and initial findings.

*AV Communication Rev.* 20:401-22, 1972. (Cited 35 times.)

2. ———. *Communication and education: social and psychological interactions.* Beverly Hills, CA: Sage, 1981. 271 p. (Cited 15 times.)

3. ———. AI in reverse: computer tools that turn cognitive. *J. Educ. Comput. Res.* 4:123-39, 1988.