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Kenneth J. Rothman: Causes. American Journal of Epidemiology 1976; 104:587–592.

Rothman's "Causes" is an exceptionally lucid outline of a point of view regarding causation that has come to be known as the "sufficient/component cause theory." While the theory is a clear descendant of ideas in earlier works (such as MacMahon and Pugh's), it was Rothman who first presented a general schematic form for deducing the relationships between the occurrence of component causes and epidemiologic measures of effect. This schematic form, illustrated in Figure 1 of the paper, allows one to visualize (and thus make precise) the meaning of terms such as "synergy" (which, under the theory, becomes co-participation in a sufficient cause).

I do have one semantic criticism of the paper: At the start of the "synergy" section, Rothman equated "synergy" with "effect modification." It is clear to me, however, that in Miettinen's original use of the term, and much of the usage since, "effect modification" means only "differing values of the effect measure at different levels of another variate," to quote from the introduction of Rothman's paper. As Rothman noted, this implies that the effect modification depends on the scale of measurement. It follows then that "effect modification" cannot in general correspond to "synergy" or co-participation in a sufficient cause, although, as Rothman was aware, certain types of modification of the risk difference would imply the presence of synergistic interactions. More importantly, "effect modification" as defined is a property of events in *populations*, whereas "synergy" is a property of events in *individuals* [Miettinen, 1982]. Perhaps all this only points out again that "effect modification" was a poor term to choose for the phenomenon of effect-measure variation across populations, since it evokes the concept of synergy.

Reference:
Miettinen OS. Causal and preventive interdependence: elementary principles. Scand J Work Env Hlth 1982; 8:159–168.