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CHARLES RAGIN, *Fuzzy-Set Social Science*. Chicago: University of Chicago Press, 2000, 352 p.

Few sociology books make as significant a contribution to both methodology and theory as this path-breaking incorporation of ideas from the mathematics of "fuzzy" sets associated with Lofti Zadeh (1965, "Fuzzy Sets," *Information and Control*, Vol. 8: 338-53) and others. Much of what is taught in research methods is based on early 20th-century notions of "correlation" based on variables measured at the ratio or perhaps interval level. However, as Blumer warned many years ago (1969, *Symbolic Interaction: Perspective and Method*, Englewood Cliffs, N.J.: Prentice Hall), the notion of a "variable" should not go unexamined. When considering typologies, the "fuzzy set" approach extends the concept of a rigid Venn diagram "set" by associating a "membership value" with each member of the set. Hence, a rudimentary form of the logic of the fuzzy set is to indicate a third category: "partial membership." (That third option can be given a value of 0.5 versus either 1 or 0.) A more complex use of fuzzy sets provides for degrees of

membership in a set (e.g., five or more numerical values). This is not simply the logic of ordinal ranking. The importance of the conceptual understanding of the fuzzy sets makes the association of the idea of fuzzy sets with the idea of "Ideal Type Models" (ITMs) clear (Bakker, 2002, "Theoretical maturity: Ideal type models as well as Turner's dream?" *Perspectives*, Vol. 25, No. 3: 3-8). The use of fuzzy sets requires specifying good theoretical reasons for "key breakpoints." From the perspective of fuzzy-set logic, the theoretical conceptualization is paramount. Thus, for example, the fuzzy set of "all rich countries" is not simply the reverse of "all poor countries" (163-65). The semantics of the argumentation are often obfuscated by the conventional variable-oriented approach. Beyond that, even the standard use of Weberian ITMs often requires "crisply defined property space locations." For example, the recent exchange between Turner (2002, "Weber, the Chinese legal system, and Marsh's critique," *Comparative & Historical Sociology*, Vol. 14, No. 2: 1-4) and Marsh (2000, "Weber's misunderstanding of traditional Chinese law," *American Journal of Sociology*, Vol. 106, No. 2: 281-302; 2002, "Weber and the Chinese legal system: A reply to Stephen P. Turner," *Comparative & Historical Sociology*, Vol. 14, No. 2: 5-7) concerning the extent to which the case of China during the Ch'ing dynasty (1644-1912 CE) is "substantively rational" or "substantively irrational" may be, in part, a dispute that could be resolved through the use of fuzzy-set logic. (It could be argued that Weber himself seems to have used fuzzy-set logic implicitly, without articulating it as an alternative to Aristotelian logic.) As Hollander (2002, "A quick look at Ragin's 'Fuzzy-Set Social Science,'" *Comparative & Historical Sociology*, Vol. 14, No. 1: 3-4) points out, Ragin has made a worthwhile contribution ". . . based on the clear examples and illustrations, the relevance to research as sociologists experience and do it, and the helpful comparisons to alternative and complementary methods." What Ragin does not attempt to do is to extend the concept of fuzzy sets to "fuzzy cognitive maps" (FCM) and neural circuits, as some popularizers (e.g., Kosko, 1993, *Fuzzy Thinking: The New Science of Fuzzy Logic*, New York: Hyperion) have done. He also does not present the mathematical arguments underlying fuzzy-set theory. Altogether, this is a well-written, well-balanced presentation of provocative ideas that no social scientist should ignore. It goes well beyond the Lazarsfeld approach to typologies and variable analysis that has dominated sociology for several decades because it has been so heuristic. Ragin does not reject previous approaches. Instead, he builds on them and deepens our methodological awareness. The invidious use of a rigid distinction between quantitative and qualitative methods, for example, is completely surpassed.

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