

Examining the modern history of interaction between social science and physics

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Less hard: “What in physics has interested sociologists and anthropologists? What has resulted?”

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Note: here “social science” = sociology and anthropology

Well documented that interest in “complexity” has drawn physicists into substantive topics that are traditionally part of social science

What about the other direction: social scientists becoming interested in physics?

Recently, new phenomena such as social scientists publishing in and reviewing for *Physical Review E*

But in fact even just in “modern” social science, there is a longer history of social scientists’ interest in physics

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“... we have so often heard of the rigor Boas brought to ethnology from his sojourn in physics. We are unable to see wherein he exhibits this rigor (Buettner-Janusch 1957: 322).”

But over the past decades even social scientists with no obvious background in physical science have expressed interest in physics

What has been the nature of that interest, how influential has it been, and are there lessons for how social science's current courtship with physics might play out?

Helpful to examine interest in physics as reflected in sociology and anthropology publications, 1946-1966

Interesting period because

- high general prestige of science
- before most politicized criticism
- but concerns from philosophical attacks on traditional positivism and association of atomic bomb with science

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Most just mention physics, or give a vague
analogy: “As physicists study atoms, ...”

Focused on 36 from anthropology and 21 from sociology that discussed physics more extensively or more seriously

Examined main themes in each article's discussion of physics

Analogy to specific process (8% / 19%)

Throughout the range of temperature at which water exists in a liquid state, two opposing processes appear to be affecting its density: the density of water tends to decrease as a result of thermal expansion as temperature *rises*; the density of water tends to decrease as a result of polymerization as temperature *falls*. ... Perhaps, analogously, there is a “masking” effect in the relationship between social nearness and apparent minority ethnocentrism. (Catton & Hong 1962: 186-7)

Analogy to overall approach of physics,
similarity/unity of fields (47% / 29%)

Our criteria of measurement and evaluation are arbitrary as they must be in all fields of science - in physics as well as in culturology. But they may be just as objective in the science of culture as in physics or physiology. (L. White 1947: 187)

The possibilities of sociology are not basically different from those of the natural scientists. It depends more on the sociologists than on the nature of their studies how good those will be and to what extent their character will be scientific. (Machotka 1949: 17)

Uncertainty/randomness in physics (25% / 10%)

Even physicists have agreed that certain phenomena, such as the behavior of the electrons, are subject to a good deal of individual variation not accounted for in its entirety by physical laws. But a science of ... physics is made possible only because the similarities among the phenomena in question are stressed, not their individual *uniqueness*.
(Hsu 1952: 235)

However, 20th century physics has divided and subdivided its units of study until now it is grappling with individual subatomic particles, and its predictive precision has been replaced by the same kind of modest statement of probability that is the product of allegedly unscientific social science when dealing with individual humans.
(Paddock 1961: 145)

Fundamental dissimilarity (33% / 19%)

So it would be error to build a social science upon the image of physics or chemistry. Social science ... is a way of learning about man in society which uses the precise procedures and the objectivity characteristic of physics as far as these will helpfully go in studying human beings but no further; and which uses ... that personal direct apprehension of the human qualities of behavior and of institutions which is shared by the novelist. (Redfield 1948: 185)

If ... we sum up our judgment of the natural-science school of sociology, to the extent of saying that it missed its aim ..., it is because we consider its favorite assumption, namely, the application of the categories of natural science to the study of human association, basically false. (Sombart 1949: 184)

We are familiar with the concerted efforts of certain American sociologists to make sociology an exact natural science, on the model of physics, by a combination of radical empiricism and mathematical dogmatism. (Znaniecki 1950: 220)

What about actual uses of physics (direct application of concepts)?

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- Glottochronology
- Gravity model

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- the specific models above didn't become extremely influential in these fields, not seen as relevant to many core issues
- discussion like this was essentially rehashed for decades

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- Same ambivalence about science (even more hostility in cultural anthropology now)
- Areas of application probably seem irrelevant to large proportion of sociologists and cultural anthropologists

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- Close match of the actual work to interests of structurally-oriented social scientists, more than just an interesting analogy

How much will this be absorbed by
(institutionalized in) social science?

Pessimistic example: animal behavior in
sociology

Optimistic example: modern
physical/biological anthropology,
archaeology