MICRO-MACRO MODELING, RATIONAL CHOICE SOCIAL RESEARCH, AND ANALYTICAL SOCIOLOGY[1]

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Roughly, sociological micro-macro modeling aims to explain social macro-level phenomena as a result of the behavior of individual actors. Much formal modeling of micro-macro links in sociology has roots in a family of research programs that conceive of sociology as a problem- and theory-guided discipline, with theory construction aiming at the explanation of social phenomena. Explanations involve deductive arguments or variants of such arguments. Thus, theory construction involves more than specifying sets of hypotheses. Rather, theory construction comprises specifying assumptions, including but not being restricted to hypotheses, as well as specifying implications of these assumptions. Due to the focus on implications, analytical rigor is an ingredient of these programs. Implications should include testable implications: empirical content in the sense of testability (at least "in principle") is a criterion for appraising sociological theories. Likewise, empirical tests of implications are a core aim and empirical corroboration is a criterion for appraising theories in addition to testability. Thus, the integration of theory construction and empirical research becomes an aim, too. Coleman (e.g., 1990), building on quite some earlier work of others (see Raub et al. 2011: 8-10 for an overview), has provided a stylized scheme that has become a standard way of representing micro-macro links.

Variants of rational choice assumptions (there are indeed quite some variants, see, e.g., Wittek et al. 2013, Kroneberg & Kalter 2012) can be used as micro-theories in such an approach. Rational choice assumptions can be seen as specifications of the idea of incentive-driven and goal-directed behavior. Applications of rational choice assumptions in micro-macro models require the use of additional assumptions over and above the assumptions of utility maximization or equilibrium behavior. More precisely, substantive assumptions are needed that specify, for example, the actors' feasible alternatives, their preferences, and their information. With respect to preferences, standard rational choice models often use the assumption that actors are self-regarding. Standard rational choice models are parsimonious, thus facilitating analytical tractability. However, many empirical regularities are hardly consistent with rational behavior, at least not when rational choice assumptions are combined with assumptions on self-regarding behavior. This has led to variants of rational choice models that replace the assumption of self-regarding behavior by assuming, for example, inequity aversion or similar motives as elements of actors' utility functions as well as heterogeneity between actors with respect to the strength of such motives (see, e.g., Fehr & Gintis 2007 for an overview). The important feature is that these models have implications for micro- as well as macro-outcomes in very different contexts and that they imply that behavior strongly depends on macro-conditions. More precisely, these models imply much cooperative behavior in contexts such as social dilemmas but seemingly selfish behavior in market contexts. While these models are less parsimonious than standard rational choice micro-models, tractability and testability is preserved.

An alternative approach favors micro-models that replace the rationality assumptions themselves and use alternative decision rules and behavioral heuristics, often modeling "bounded rationality." Such micro-models include, for example, a variety of models assuming myopic behavior, backward-looking learning models, and evolutionary models. Such micro-level assumptions are sometimes integrated in micro-macro models that allow for analytical equilibrium solutions. Often however, these micro-level assumptions are incorporated in models that rely on computational simulation models.

[1] This contribution to the INAS-Plenary Session is a (very) rough summary (including excerpts) of parts of Raub et al. (2011) and Buskens & Raub (2013). See Raub (2011) for additional details and extensions.

Analytical sociology "seeks to explain complex social processes by carefully dissecting them and bringing into focus their most important constituent components. The approach focuses on traditional sociological concerns but uses explanatory strategies more often found in analytical philosophy and behavioural economics. It is an approach that seeks precise, abstract, realistic and action-based explanations for various social phenomena" (Hedström 2005: 1). Many features of micro-macro modeling in general as well as, more specifically, rational choice models fit well with such a program. This includes not only the focus on precision and rigor as well as on action-based explanations for social phenomena. It also includes the focus on testable implications of formal models and on the integration of theory construction, empirical research, and statistical modeling. However, Hedström likewise ties analytical sociology to what he labels "mechanism-based explanation" and to his "DBO theory" of action (with DBO for desires, beliefs, and opportunities). Hedström then accentuates the differences between mechanism-based explanations and deductive arguments, let alone deductive-nomological explanations in Hempel's sense. Also, Hedström (2005: 41) sees rational choice theories and learning theories as alternatives to rather than special cases of DBO theory.

Is this the most fruitful way of "positioning" the analytical sociology approach? Science and the growth of knowledge tend to benefit from pluralism combined with cumulative growth of knowledge (as opposed to fragmentation). This includes theoretical pluralism in the sense of alternative theories and explanations for the same empirical phenomena and regularities, empirical pluralism in the sense of testing the same theory in various domains, and also pluralism in the sense of testing the same hypotheses using alternative and complementary research designs, such as observational studies and survey research as well as experiments (lab and field as well as quasi-experimental designs such as vignettes, see Buskens & Raub 2013). Thus, would it not be more fruitful to conceive of analytical sociology as a broad research program that comprises various variants of micro-macro modeling and, similarly, to conceive of DBO theory as a useful umbrella term for micro-theories that rely on the idea of incentive-driven and goal-directed behavior, rather than seeing analytical sociology and DBO theory on the one hand and rational choice models (or other models like those mentioned above) on the other as competitors? Competition between alternative micro-macro models is likely to be fruitful but the competitors, I guess, are variants of rational choice models as indicated above, as well as variants of, for example, models assuming myopic behavior, backward-looking learning models, and evolutionary models, including analytical models as well as computational simulation models, with "analytical sociology" and "DBO theory" as (part of) the common core and focus of these models. Thus conceived, analytical sociology could play an important role in bringing common ground between different and competing approaches to rigorous theory and empirical research in sociology to the fore. In this way, analytical sociology could mitigate rather than further contribute to fragmentation of the discipline.

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