International Journal of Science and Social Science Research
ISSN: 2583-7877 Peer Reviewed & Refereed Journal
Page No: 122-134 DOI: https://doi.org/10.63671/ijsssr.v4i2.514
Volume: 4 | Issue: 2
July-September 2026

The Realistic Reduction of Complexity: Toward a Causal-Scientific Paradigm of Sociology

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Abstract—Contemporary sociology is characterized by an extraordinary plurality of theories, concepts, methods, and levels of explanation. This plurality is often justified by reference to the inherent complexity of social reality. The present article challenges the implicit assumption that increasing theoretical complexity necessarily produces better scientific explanations. Science cannot reproduce reality in its totality. It necessarily reduces complexity by identifying those variables and relations that are causally relevant to a defined explanandum. Building on causal-scientific structural sociology, this article develops the concept of realistic complexity reduction. It distinguishes methodological reduction of complexity from ontological reductionism. Social and societal structures are understood as emergent realities whose causal effects cannot adequately be reduced to individualistic explanations. Sociology requires selective models that make these structural effects empirically accessible. The central proposition is that realistic complexity reduction in sociology should focus on empirically testable relations between structural causes and behavioral distributions. Individual variation does not contradict structural causation. It results from the interaction between social and societal structures and heterogeneous personality structures. This perspective reformulates the classical micro-macro problem. Rather than attempting to derive social regularities from autonomous individual actors, sociology can investigate how changes in structural conditions modify distributions of perception, emotion, thought, and behavior. The classical conformity experiments of Solomon Asch are used exemplarily to illustrate this explanatory strategy. The article proposes behavioral distributions as a mediating concept between structural realism and empirical causal research and relates this approach to contemporary discussions of emergence and causal emergence. A research strategy is outlined based on clearly defined explananda, structural variables, personality heterogeneity, causal mechanisms, counterfactual comparison, and falsifiable distributional predictions. The objective is neither radical simplification nor a reduction of society to physics, biology, or psychology. It is the identification of those realistic simplifications that reveal the causal organization of social reality.

Keywords: causal-scientific structural sociology; complexity reduction; realism; causal explanation; social structure; behavioral distributions; downward causation; causal emergence; personality structure; Durkheim

I. INTRODUCTION

Modern societies are complex. They consist of interacting institutions, organizations, technologies, symbolic systems, economic relations, political structures, groups, networks, cultural patterns, and billions of individuals with different biological and biographical characteristics. No sociological theory can represent this reality in its entirety. Yet sociology frequently treats the complexity of its object as a reason for theoretical pluralism rather than as a scientific problem requiring selective explanation. This creates a fundamental epistemological question:

How can sociology reduce social complexity without reducing social reality to an inappropriate level of explanation?

Every science reduces complexity. A scientific theory does not reproduce everything that exists. It selects those properties, variables, and relations that are relevant to a particular problem. The crucial question is therefore not whether reduction takes place. It inevitably does. The question is whether the reduction is scientifically adequate. The present article proposes the concept of realistic complexity reduction. Its central thesis can be formulated as follows: Realistic complexity reduction means

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reducing the complexity of social reality neither to individuals nor to one lower ontological level, but to empirically testable relations between structural conditions and behavioral distributions. This proposition is part of the research program of causal-scientific structural sociology (kausalwissenschaftliche Struktur-Soziologie) developed in earlier work since 2012 (16 articles in "soziologie heute", Schwartz, 2023, 2024, 2025, 2026a, 2026b).

A first programmatic formulation introduced the relationship between social structures, behavioral distributions, causal regularities, and individual behavior (Schwartz, 2026b). The present article addresses a narrower scientific problem. It asks how such a sociology can transform overwhelmingly complex social reality into scientifically manageable explanatory models without denying emergence, individual variation, historical contingency, or the reality of social structures. The answer proposed here is not maximal theoretical complexity. It is selective causal abstraction.

II. COMPLEXITY AS AN OBJECT AND AS AN EPISTEMOLOGICAL PROBLEM

Complexity is an objective characteristic of many systems. A society contains more possible interactions, communications, decisions, interpretations, and causal relations than any observer could simultaneously process. Complexity therefore constitutes a genuine problem for human cognition. But a distinction must be made between the complexity of reality and the complexity of scientific explanation. A complex object does not necessarily require an equally complex explanatory model. In science theoretical progress consists precisely in discovering relatively simple relations underlying apparently heterogeneous phenomena (s. E=mcc). Scientific explanation therefore involves abstraction. Variables considered irrelevant to the particular explanandum are provisionally excluded. This procedure does not imply that the excluded variables do not exist. It means only that they are not required for the specific explanation under investigation. Without selective abstraction, a scientific model would ultimately have to contain the entire causal history of the phenomenon it seeks to explain. Such a model would reproduce complexity instead of reducing it scientifically.

The same difficulty appears in sociology. A particular political behavior may be related to personality, family history, education, economic position, peer groups, institutions, media consumption, ideological structures, technological infrastructures, historical events, symbolic identification, emotional processes, and numerous additional variables. All of these may be relevant under certain conditions. But an explanation cannot simply reproduce the entire causal network. It must determine which variables are relevant to the phenomenon under investigation. Thus, complexity reduction is not an optional defect of sociological theory. It is a condition of explanation.

III. THE COMPLEXITY PARADOX OF SOCIOLOGY

Contemporary sociology contains a remarkable diversity of theoretical traditions. Methodological individualism, interpretative sociology, phenomenology, symbolic interactionism, structuralism, functionalism, systems theory, critical theory, relational sociology, network analysis, rational-choice theory, constructivism, and numerous specialized approaches offer different descriptions of social reality. This plurality has produced important insights. However, it can also create what may be called a complexity paradox: The complexity of society is answered by an increasing complexity of sociology itself.

Theoretical plurality can become self-reinforcing. Every phenomenon can be redescribed from additional perspectives, using additional concepts and theoretical vocabularies. Description becomes richer, but richer description does not necessarily produce better explanation. Niklas Luhmann represents one of the most sophisticated sociological attempts to make complexity itself a central theoretical category (Luhmann, 1995). His systems theory demonstrates how powerful high-level abstraction can be in a phenomenological and functional description but in his case the result was an ideology of complexity, which blocked the progress to sociology as a science. Sociology must reduce complexity to become a real science. The central question is therefore not only how social systems manage complexity but how sociology identifies causal relations within social complexity. A theory of complexity is not automatically a causal theory. Complexity can describe the problem faced by a system. Causal explanation asks why a particular phenomenon occurs and under which conditions it changes.

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IV. REDUCTION OF COMPLEXITY IS NOT REDUCTIONISM

The criticism of reductionism is widespread in the social sciences, and much of this criticism is justified. A social institution cannot adequately be explained by describing neural activity alone. An organization cannot be understood merely as a collection of isolated psychological states. A society cannot be reduced to the biology of its members. Higher levels of organization produce properties and relations that are not adequately represented by descriptions at lower levels. This article therefore distinguishes two fundamentally different concepts: ontological reductionism and methodological reduction of complexity. Ontological reductionism attempts to eliminate the explanatory autonomy of higher levels.

Methodological complexity reduction does something different. It selects those aspects of reality that are relevant to a defined explanatory problem. Causal-scientific structural sociology rejects ontological reductionism while requiring methodological reduction. This distinction makes it possible to combine emergence with causal analysis. Social and societal structures are real and causally effective. Institutions, languages, legal systems, organizations, markets, media environments, symbolic structures, and political systems historically emerge through human activity. Once established, however, they become conditions of action for individuals who did not create them.

A language is produced and reproduced by human beings, yet a newborn child does not create the language it must learn. A legal system is historically created by people, yet individual citizens encounter it as an already existing institutional reality. An organization depends on its members, yet new members enter a structure of roles, rules, expectations, communication channels, and power relations that precedes them. Emergence and causation are therefore compatible.

V. ONTOLOGICAL REALISM AND SCIENTIFIC FALLIBILISM

The proposed reduction requires a minimal form of ontological realism. Scientific explanations can fail only if there is a reality that is not identical with the categories of the explanation. This proposition does not imply naïve realism. Human beings do not possess direct, complete, or infallible access to reality. Knowledge is mediated through perception, language, concepts, theoretical assumptions, instruments, social communication, and historically developed categories.

Scientific knowledge is therefore fallible. But the fallibility of knowledge does not imply that reality itself is a construction of the observer. A useful distinction can be formulated as follows: Scientific theories are constructions; the realities to which they refer are independent of the constructions. This becomes particularly important in sociology. Social structures frequently have symbolic or abstract forms. Money, citizenship, organizations, laws, borders, status systems, institutional roles, languages, and constitutions cannot be treated as material objects in the same sense as stones or biological organs. Nevertheless, they produce observable consequences. Their abstract character does not make them causally irrelevant.

An ontologically realistic sociology therefore treats structures as real insofar as their existence makes systematic differences to observable outcomes. Realism in this sense is not a claim to epistemic certainty. It is the assumption that competing sociological explanations refer to an objective reality and can therefore be criticized, compared, falsified, improved, or rejected (Popper, 1959).

VI. THE CENTRAL REDUCTION: STRUCTURAL CONDITIONS AND BEHAVIORAL DISTRIBUTIONS

The most important methodological proposal of causal-scientific structural sociology concerns the relation between structural causes and distributions of behavior. For heuristic purposes, this relation can be represented as:

$S \rightarrow D(B)$

where S represents a specified social or societal structural cause and D(B) represents the distribution of behavior under that condition.

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This notation is intended only as a heuristic representation of the proposed causal architecture, not as a fully specified mathematical model. The formulation does not claim that a structure produces identical behavior in all individuals. That would be empirically implausible. Instead, it proposes that structures systematically create probabilities and therefore distributions of behavior. Consider an organizational hierarchy, a group norm, a legal prohibition, an economic incentive structure, an advertising environment, an algorithmic social-media architecture, an educational institution, or a political symbol. None of these conditions must determine every individual response in exactly the same way. Their causal effect can instead be investigated by asking whether changes in the structural cause systematically alter the distribution of responses. This corresponds to the general interventionist idea that causal claims concern systematic counterfactual dependence under appropriate changes in causal variables (Woodward, 2003).

The sociological explanandum therefore becomes:

Why does a particular distribution of behavior emerge under specified structural conditions?

This is different from asking only why individual X performed action Y. Both questions are legitimate, but they belong to different explanatory levels. The second question is frequently psychological, biographical, or situational. The first becomes specifically sociological when the distribution is systematically related to social or societal structures.

VII. BEHAVIORAL DISTRIBUTIONS AS THE MISSING MEDIATING CONCEPT

The concept of behavioral distributions can help overcome one of sociology's oldest theoretical oppositions. Individualistic theories emphasize actors/agents. Structural theories emphasize social causes. The relationship between the two is conventionally formulated as a micro-macro problem.

How do individual actions generate structures?

How do structures influence individuals?

The opposition becomes less problematic once behavioral distributions are introduced as a mediating concept.

Structures do not need to control every individual identically. They need only systematically influence the distribution of possible responses. The explanatory sequence becomes: structural causes → distributional effect → individual variation within the distribution. The behavioral distribution is therefore the empirical interface between structure and individual behavior.

It is neither a purely macro phenomenon nor merely an aggregation of unrelated individual decisions. It represents an empirically observable pattern requiring causal explanation. The form of the distribution must remain an empirical question. Some phenomena may approximate normal distributions. Others may produce skewed, multimodal, polarized, heavy-tailed, or highly concentrated distributions. Causal-scientific structural sociology therefore does not require a universal Gaussian model of social behavior. Its claim is more general: Social and societal structures generate or modify patterned distributions of behavior.

The specific mathematical form depends on the empirical phenomenon and the causal configuration involved (mainly the strength of the structures, f.e. totalitarian vs. democratic).

VIII. PERSONALITY STRUCTURES AND INDIVIDUAL VARIATION

The effect of a social or societal structure depends partly on the individuals exposed to it. People differ in biological/genetic dispositions, cognitive capacities, temperament, biography, socialization, learning history, emotional structure, and previous experience. These relatively stable individual characteristics can be summarized by the concept of personality structure. The personality structure consists of the limits (genetics) and the potential (epigenetic and biographical conditionings) within these limits of every individual. The behavior of individual i may therefore be represented heuristically as:

$B_i = f(S, P_i)$

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where B_i represents the behavior of individual i, S the relevant structural causes, and P_i the personality structure of individual i.

At the population level, the proposed relationship can be represented as:

$D(B) = f[S, D(P)]$

where D(P) represents the distribution of relevant personality structures. Again, f does not denote an already specified mathematical function. The notation expresses a causal hypothesis that must be operationalized differently for particular empirical research problems. This formulation has two advantages. First, structural causation no longer requires behavioral uniformity. Second, individual differences no longer function as automatic evidence against structural explanation. A minority that resists a strong group norm does not demonstrate that the group norm has no causal effect. The relevant question is whether the behavioral distribution would have been different without that norm. Individual deviation is part of what requires explanation. It results from personality characteristics that make a person more or less susceptible to a particular structural influence. This also clarifies the relationship between sociology and psychology. Psychology can study individual dispositions and mechanisms. Sociology can study the effects of social and societal structures on distributions of behavior. The levels are causally connected but analytically and scientifically distinguishable.

IX. STRUCTURAL CAUSATION AND DOWNWARD CAUSATION

If structures are emergent realities, how can they cause behavior?

The concept of downward causation is sometimes criticized because it appears to transform abstract entities into mysterious forces. No such assumption is required here. Structural causation is realized through concrete mechanisms. An organization acts through rules, sanctions, communication channels, hierarchies, incentives, role expectations, allocation of resources, and access to information. A legal structure acts through formal norms, enforcement institutions, expectations, sanctions, and administrative procedures. A digital platform acts through technical architecture, interface design, algorithms, visibility rules, feedback systems, recommendation structures, and quantitative signals of approval and disapproval. A symbolic structure acts through learned meanings, emotional associations, group identification, expectations, and communication. Downward causation can therefore be understood as follows:

An emergent structure changes the causal environment within which individuals perceive, interpret, decide, and behave. This definition neither mystifies social structures nor reduces them to isolated individuals. The relevant empirical task is to specify the mechanisms through which a structural modification changes behavioral probabilities.

IX.I. RELATION TO CONTEMPORARY THEORIES OF CAUSAL EMERGENCE

The account of structural causation proposed here can be related to contemporary approaches that reject both simple micro-reductionism and metaphysically obscure forms of downward causation. Chalmers (2006) distinguishes weak emergence, in which higher-level phenomena remain dependent on lower-level processes, from strong emergence, in which higher-level phenomena involve fundamentally novel principles. The present approach does not require strong emergence. Social structures exert causal effects through identifiable mechanisms such as institutional rules, sanctions, communication architectures, incentives, symbolic meanings, and technological constraints. A complementary perspective is provided by research on causal emergence. Hoel and colleagues have used the concept of effective information to investigate circumstances under which macro-level descriptions can provide stronger causal information than corresponding micro-level descriptions (Hoel et al., 2013). More recently, Hoel (2025) has extended this problem into a multiscale framework of causal analysis. The present sociological framework asks a related but distinct question. Rather than defining causal relevance primarily through information-theoretic measures, it proposes that the relevance of a social structural level can be investigated through systematic changes in observable behavioral distributions. The two approaches therefore converge on an important principle: reduction to the individual or micro level is not necessarily the causally most informative description. Whether a particular social structure

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possesses explanatory relevance must ultimately be decided by its empirically demonstrable contribution to differences in behavioral distributions.

X. AN EMPIRICAL ILLUSTRATION: ASCH'S CONFORMITY EXPERIMENTS

The classical conformity experiments conducted by Solomon Asch provide a simple illustration of the proposed research logic (Asch, 1951, 1956). Participants were asked to make perceptually straightforward judgments about the lengths of lines. Under ordinary conditions, the task generated very few errors. The crucial structural intervention consisted of placing an individual participant in a group in which several confederates unanimously gave an obviously incorrect answer. The physical stimulus remained essentially unchanged. What changed was the social structure of the decision situation. The introduction of a unanimous majority systematically changed the distribution of participants' responses. Across the critical trials of Asch's experiments, participants conformed to the erroneous majority in a substantial proportion of cases, while conformity was greatly reduced when the unanimity of the majority was broken (Asch, 1956).

The experiment can therefore be represented heuristically as:

S_1: individual judgment without unanimous social pressure $\rightarrow D(B_1)$

S_2: individual judgment within a unanimously incorrect majority $\rightarrow D(B_2)$

with:

$D(B_1) \neq D(B_2)$

The structural manipulation changes the distribution of behavior. Equally important for the present theory is the fact that not every participant conformed. Some participants remained independent throughout, while others conformed frequently or occasionally. This individual heterogeneity does not invalidate the causal effect of the group structure. On the contrary, it illustrates the distinction between structural causation and behavioral uniformity. In the terminology proposed here:

$D(B) = f[S, D(P)]$

The group structure changes the behavioral distribution, while heterogeneous individual characteristics contribute to variation within that distribution. The Asch paradigm also demonstrates how a structural hypothesis can become falsifiable. If the unanimous majority were causally irrelevant, altering or breaking its unanimity should not systematically change conformity. Yet Asch's variations showed that the social configuration of the group mattered substantially (Asch, 1956). The example should not be generalized into a universal law of conformity. Its significance here is methodological. It demonstrates how a defined structural manipulation can be linked to a measurable change in a behavioral distribution while preserving individual variation.

This is the basic logic of realistic complexity reduction.

XI. SUBJECTIVE AGENCY WITHIN A CAUSAL FRAMEWORK

Human beings experience themselves as choosing, deciding, intending, and acting. These subjective experiences are socially and psychologically important. A causal sociology need not deny their phenomenological reality. It only rejects the assumption that subjective experience must constitute an uncaused origin of behavior. Motives, intentions, preferences, and decisions can themselves be causally conditioned (Hassin, Uleman, & Bargh, 2005; Bargh, 2017; Sapolsky, 2023). The distinction between subjective freedom and objective causal independence therefore allows sociological explanation to proceed without eliminating meaning. The important sociological question becomes not only what motive an individual reports but why particular motives, interpretations, preferences, and actions become more probable under particular structural conditions. This issue is relevant to the micro-macro problem, but it is not the primary subject of the present article. The central methodological question remains the reduction of social complexity to empirically testable causal relations.

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XII. DURKHEIM RECONSIDERED

Émile Durkheim remains an important point of reference because he insisted that social facts possess properties that cannot adequately be explained through individual psychology alone (Durkheim, 1982 [1895]). His methodological orientation can be reformulated for contemporary causal research. The central proposition becomes: Social phenomena should, where appropriate, be explained through causal relations between social and societal structures and observable social outcomes. Behavioral distributions provide a measurable form of such outcomes. This reformulation retains Durkheim's structural realism without requiring a return to nineteenth-century methodology. Modern causal inference, statistical modelling, experimental methods, network analysis, longitudinal designs, and computational approaches provide possibilities unavailable to classical sociology. Durkheim's fundamental intuition can therefore be separated from the historical limitations of his empirical methods. The resulting program is neither Durkheimian orthodoxy nor methodological individualism. It treats social structures as causally relevant emergent realities and behavioral distributions as observable consequences that can be investigated empirically.

XIII. REALISTIC COMPLEXITY REDUCTION AS A RESEARCH PROCEDURE

The concept of realistic complexity reduction can now be translated into a concrete research procedure.

XIII.I. DEFINE THE EXPLANANDUM

The first step is to specify what requires explanation.

The explanandum should be sufficiently precise to permit empirical comparison. Examples include voting distributions, conformity rates, consumption patterns, patterns of cooperation, organizational behavior, adoption of technologies, distributions of trust, patterns of violence, media-use behavior, and responses to institutional incentives. The relevant unit is often a distribution rather than one individual action.

XIII.II. IDENTIFY THE RELEVANT STRUCTURAL CONDITION

The second step is to specify a structural variable or configuration that may influence the distribution.

Possible structures include institutional arrangements, organizational hierarchies, communication structures, network configurations, technologies, media architectures, symbolic systems, economic rules, legal frameworks, and group structures. The category of structure must not become an undefined residual concept. The relevant structure must be operationalizable.

XIII.III. FORMULATE THE EXPECTED DISTRIBUTIONAL EFFECT

A causal hypothesis should specify how the distribution is expected to change when the structural condition changes. Heuristically:

$\Delta S \rightarrow \Delta D(B)$

If the hypothesized structural condition changes, the behavioral distribution should change in a theoretically predicted direction.

XIII.IV. INCLUDE HETEROGENEOUS PERSONALITY STRUCTURES

Different individuals respond differently to the same condition. The model should therefore allow heterogeneous effects.

The question is not whether every individual responds identically but whether the structural condition systematically modifies the population distribution.

XIII.V. IDENTIFY CAUSAL MECHANISMS

Researchers should specify how the structure is expected to influence behavior.

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Possible mechanisms include incentives, sanctions, imitation, information, emotional activation, symbolic identification, social expectations, authority, institutional constraints, and technological affordances.

XIII.VI. TEST COUNTERFACTUAL DEPENDENCE

A causal claim implies that the outcome distribution would differ under relevant alternative structural conditions (Woodward, 2003). This can be investigated experimentally where possible and through quasi-experimental or observational causal methods where direct intervention is impossible.

XIII.VII. REMAIN OPEN TO FALSIFICATION

If predicted distributional changes fail to occur, the structural hypothesis must be revised or rejected (Popper, 1959). Realistic complexity reduction therefore simplifies reality provisionally.

Its legitimacy depends on explanatory success.

XIV. CAUSAL INFERENCE AND THE STRUCTURAL RESEARCH PROGRAM

Modern causal inference provides an important methodological bridge between theoretical structural sociology and empirical research (Pearl, 2009; Woodward, 2003). The structural approach proposed here does not depend on one statistical technique. Depending on the phenomenon, appropriate methods may include randomized experiments, natural experiments, quasi-experimental designs, longitudinal analyses, difference-in-differences, regression discontinuity, instrumental variables, matching methods, causal graphical models, and comparative institutional analysis. The fundamental issue precedes statistical technique. Researchers first need a theoretically meaningful causal question.

For example:

Does a change in organizational hierarchy modify cooperation?

Does a change in recommendation architecture modify distributions of attention?

Does a legal institution alter the probability of particular behavior?

Does group composition influence conformity?

Does a symbolic communication environment alter attitudes or behavioral responses?

The method then depends on the empirical context. The general logic remains:

structural variation → predicted distributional variation

A causal-scientific sociology is therefore neither purely theoretical nor merely empirical. The “physics of society” identifies relevant structural hypotheses. Empirical research tests whether the expected distributional consequences occur.

XV. WHY INDIVIDUAL-LEVEL EXPLANATION IS INSUFFICIENT

Methodological individualism has made no contributions to sociological explanations of structural collective phenomena, just plausible phenomenological descriptions (ideal types).

“That is to say: if one has succeeded in expressing collective phenomena (such as national identity) in individual terms (e.g., as the opinions, attitudes, or actions of individuals regarding their own or another nationality), it remains necessary to explain the laws governing how these individual acts were disaggregated and how they are to be re-aggregated at the macro level. If, instead, the mere empty term ‘aggregation’ is used and no law of composition can be specified, then—even from the perspective of moderate methodological individualism—no valid explanation exists.” (Bühl 2000: 46/47/Google translation) Individuals are always already located within structures. They encounter languages, institutions, technologies, economic systems, power relations, organizations, and cultural meanings that precede their particular decisions. Individual preferences

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themselves are causally determined by personal, social and societal structures. An explanation that begins with individual preferences without asking how preferences are distributed and produced therefore risks stopping the causal analysis too early. This does not invalidate individual-level research in psychology or realtional research in social psychology. The causal-scientific structural approach asks a complementary, sociological question:

Which structural causes explain why particular preferences, interpretations, and behaviors occur with particular frequencies and distributions?

The reduction from social complexity to structural causes and behavioral distributions therefore avoids both methodological extremes. It neither dissolves society into isolated agents nor treats society as an autonomous substance without scientifically measurable individual distributions.

XVI. STRUCTURAL CHANGE AND UPWARD CAUSATION

A theory of structural causation must also explain how structures change. If structures influence behavior, structural sociology must avoid depicting all individuals as passive products of immutable social and societal causations. Structural change can be conceptualized through a causal evolutionary sequence:

variation → selection → institutionalization → new structure

Individuals and groups continuously produce behavioral and symbolic variations. Most disappear. Some are socially selected. A smaller number become stabilized through repetition, imitation, organizational adoption, technological implementation, legal codification, or institutionalization. Once institutionalized, they become part of the causal environment of subsequent actors.

The causal sequence can therefore be expanded:

existing structure → behavioral distribution → variation → selection → institutionalization → modified structure → modified behavioral distribution This is not a return to metaphysical agency.

Variation itself has causes.

Individuals with unusual personality structures generate unusual ideas or behavior. Historical circumstances can make some variations more likely to be selected than others. Exceptional individuals may therefore have disproportionate effects on structural evolution without being causally unconditioned. Upward and downward causation can thus be integrated within one dynamic model.

XVII. THE LIMITS OF THEORETICAL PLURALISM

Theoretical pluralism is often defended as appropriate to the complexity of social reality. Different theoretical perspectives can reveal aspects ignored by others, and pluralism is especially useful during exploratory phases of scientific development. However, pluralism cannot be the final criterion of scientific progress. If mutually incompatible explanations remain permanently protected by the claim that every perspective is valid from its own standpoint, systematic theoretical selection becomes impossible. A cumulative science requires mechanisms for comparing explanations (Popper, 1959). Relevant criteria include conceptual clarity, causal specificity, empirical testability, explanatory scope, predictive success, compatibility with established evidence, ability to integrate previously disconnected findings, and falsifiability. Theoretical diversity remains valuable. But it becomes part of a competitive and cumulative research process rather than an end in itself.

Realistic complexity reduction therefore does not demand one final sociological theory, but a consistent search for the grand theory with the best explanatory capacity.

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XVIII. EXPLANATION AND INTERPRETATION

Human behavior involves meanings. Actors interpret situations, communicate symbolically, formulate motives, and construct narratives about themselves and others. A causal sociology should not ignore this dimension, but take them as objects of the research process. Meaning and explanation should not be treated as identical. An actor's explanation of his or her own behavior is itself an empirical phenomenon. It may be causally on one level relevant. But it may also be incomplete or mistaken. The distinction between interpretation and causal explanation can therefore be maintained without devaluing either. They are complementary but with the explanation as the core of sociological scientific progress.

"For most of the history of our species, we had almost no success in creating such knowledge. Where does it come from? Empiricism said that we derive it from sensory experience. This is false. The real source of our theories is conjecture, and the real source of our knowledge is conjecture alternating with criticism. We create theories by rearranging, combining, altering and adding to existent ideas with the intention of improving upon them. The role of experiment and observation is to chose between existing theories, not to be source of new ones. We interpret experiences through explanatory theories, but true explanations are not obvious. Fallabilism entails not looking to authorities but instead acknowledging that we may always be mistaken, and trying to correct errors. We do so by seeking good explanations- explanations that are hard to vary in the sense that changing the details would ruin the explanation. This, not experimental testing, was the decisive factor in the scientific revolution, and also in the unique, rapid, sustained progress in other fields that have participated in the Enlightenment." (Deutsch 2011: 32)

Qualitative and interpretative research can contribute to identifying relevant meanings, discovering possible mechanisms, reconstructing subjective experience, generating hypotheses, and identifying structural contexts. Causal research can then ask whether changes in specified causal structures systematically modify observable outcomes. The two levels are complementary when their epistemological and scientific functions are clearly distinguished.

XIX. TOWARD A CAUSAL-SCIENTIFIC PARADIGM OF SOCIOLOGY

The argument developed here suggests a necessary reorganization of sociological explanation. Instead of beginning from the unlimited complexity of society, research can begin from a clearly specified distributional phenomenon. Instead of treating structures as vague background conditions, researchers can operationalize them as candidate causal variables. Instead of treating individual deviations as refutations of structural causation, heterogeneous personality structures can be incorporated into the model to explain the deviations. Instead of opposing macro and micro levels, the relation between structures and behavioral distributions can integrate them realistically.

The basic explanatory architecture can therefore be represented heuristically as:

$D(B) = f[S, D(P)]$

For dynamic social change:

$S_1 \rightarrow D(B_1) \rightarrow$ variation $\rightarrow$ selection $\rightarrow$ institutionalization $\rightarrow S_2 \rightarrow D(B_2)$

These expressions are conceptual models, not mathematical laws. Their purpose is to reduce theoretical complexity sufficiently to permit coherent theoretical and empirical research. The substantive variables will differ across fields. The general causal architecture and theory can nevertheless provide a common research framework.

XX. FROM CAUSAL SOCIOLOGY TOWARD A "PHYSICS OF SOCIETY"

The expression physics of society can easily be misunderstood as a materialistic conception. It does not imply that sociology should copy classical mechanics. Nor does it imply that social phenomena can be reduced to physical phenomena. Its meaning is methodological. The natural sciences became powerful partly because they identified causal relations and regularities behind highly complex appearances. A future causal sociology should pursue an analogous objective at its own emergent level.

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Human societies are part of nature. Their structures are generated by biological organisms capable of symbolic communication, technological development, institutionalization, imitation, reflection, and social organization. There is no principled reason to assume that emergent social reality is therefore causally lawless. Its regularities may be probabilistic, historically contingent, institutionally dependent, technologically mediated, symbolically transmitted, sensitive to feedback, and modified by individual heterogeneity. These properties make social explanation difficult. They do not make it impossible.

A "physics of society" would therefore search for reproducible causal dependencies between structural causations and distributions of human behavior (Schwartz, 2026a). The decisive methodological shift is from the question:

How can sociology represent the full complexity of society? to the question:

Which structural differences systematically make which behavioral differences?

XXI. DISCUSSION

The concept of realistic complexity reduction attempts to resolve several tensions within sociological theory. First, it distinguishes the complexity of reality from the complexity required by an explanation. Second, it distinguishes methodological reduction from ontological reductionism. Third, it combines structural realism with empirical fallibilism.

Fourth, it integrates individual heterogeneity into structural causation. Fifth, it reformulates the micro-macro problem through the relation of social and societal structures with behavioral distributions. Sixth, it provides a route from abstract structural theory toward causal empirical research. The Asch experiments demonstrate on the level of social psychology the elementary logic of the approach: a defined modification of the social structure of a situation produces a measurable modification of the distribution of behavior, while substantial individual variation remains. The proposed paradigm therefore occupies a position between several traditional alternatives. It is structural in the sense that abstract entities such as an ideology or the collective consciousness are real causes measurable in concrete behavioral distributions. It is causal without reducing society to biology or psychology. It accepts individual variation without treating variation as evidence against structural determination. It accepts subjective meaning as an object of research without treating subjective explanations as ultimate causes. It accepts social complexity without transforming complexity into an argument against scientific reduction of complexity.

And it accepts theoretical pluralism as the beginning of a consequent search for the grand theory with the best explanatory capacity. A reduction is scientifically productive when it removes irrelevant complexity while retaining variables necessary to explain the phenomenon. A reduction is scientifically defective when it eliminates causally relevant dimensions. Which reduction is adequate is determined by the historically best axioms discovered by gifted individuals and the consistent and coherent theory on this foundation.

XXII. LIMITATIONS AND FUTURE RESEARCH

The present article develops a theoretical framework and illustrates its logic with a classical experimental example rather than presenting a completed empirical research program. Several problems remain. First, the concept of structure requires domain-specific operationalization. A legal institution, a social network, an ideological structure, a digital platform, and an organizational hierarchy cannot be measured in the same way. Second, personality structure is used here as a broad theoretical category. Its operationalization requires collaboration with psychology, behavioral genetics, developmental research, neuroscience, and related disciplines. Third, behavioral distributions can take very different mathematical forms. Future research should investigate which structural conditions generate which types of distributions.

Fourth, causal effects may differ across populations and historical contexts. Structural sociology therefore requires systematic comparative research. Fifth, feedback processes complicate causal analysis, but do not make the progress of causal explanations impossible. Individual, structural relevant behavior can destabilize, or transform the structures that helped generate the mass behavior. Dynamic models are therefore required. Sixth, the relationship between the behavioral-distribution approach developed here and information-theoretic models of causal emergence remains to be investigated. Hoel's framework

International Journal of Science and Social Science Research
ISSN: 2583-7877 Peer Reviewed & Refereed Journal
Page No: 122-134 DOI: https://doi.org/10.63671/ijsssr.v4i2.514
Volume: 4 | Issue: 2
July-September 2026

suggests the possibility of formally comparing causal information across levels, while causal-scientific structural sociology proposes behavioral-distribution changes as the central empirical criterion for sociological structural effects. Connecting these approaches may provide a promising future research program. Finally, the distinction between relevant and irrelevant complexity can never be determined once and for all. Scientific progress may reveal previously excluded variables to be causally important.

The necessary realistic complexity reduction must therefore remain revisionary and fallibilistic.

XXIII. CONCLUSION

Social reality is complex. Scientific explanation can never reproduce that complexity in its entirety. Sociology therefore inevitably has to reduce societal complexity to become scientific. The present article has proposed a specific answer: Realistic complexity reduction means reducing the complexity of social reality neither to individuals nor to one lower ontological level, but to empirically testable relations between structural causations and behavioral distributions. This proposition preserves the reality of emergent social structures while making structural hypotheses empirically accessible. Individual variation does not invalidate structural causation. It can be incorporated through heterogeneous personality structures.

The resulting explanatory architecture can be represented heuristically as:

$D(B) = f[S, D(P)]$

Structures interact with distributions of individual dispositions and generate patterned distributions of behavior. The Asch conformity experiments provide a classical illustration. Altering the social structure of an otherwise simple perceptual task systematically altered the distribution of responses without eliminating individual differences. Sociology can investigate such relations through experiments, quasi-experiments, comparative research, causal inference, longitudinal analysis, and other empirical methods. The approach does not promise a final theory of society. The approach proposes a research strategy on the basis of a consistent theory with a coherent ontological and epistemological background, described in my books. Its objective is not to eliminate social complexity but to identify the causal relations hidden within it. Scientific progress depends on the reduction of complexity. But useful reduction must follow the structure of reality rather than replace reality with an ideological or just methodological construction. The future of explanatory sociology may therefore depend less on producing ever more complex descriptions of society than on discovering which reductions reveal its causal structure.

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International Journal of Science and Social Science Research
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Page No: 122-134 DOI: https://doi.org/10.63671/ijsssr.v4i2.514
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