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Contingency, Realism, and the Expansion Method

This paper examines the relationship between scientific realism and the expansion method. The frame of reference for our investigation is their joint conceptualization of "contingency." We first explore the varied historical meanings of contingency; this is followed by a survey of its differential deployment within geographic thought. Attention then turns to theorizations of contingency in realism and the expansion method. The final portion of the paper assesses the potential for integrating these two analytic traditions within geographic research.

I. INTRODUCTION

For most disciplinary historians, the growth of spatial science in geography had its origins in a number of decisive critiques of the purposes and methods of the areal differentiation tradition that had previously dominated the discipline. Of these critiques, the one Schaefer (1953) directed against "exceptionalism" perhaps had the greatest impact. To Schaefer, the idea that geography was an exceptional discipline—one that remained methodologically unique from other social and natural sciences—led practitioners of regional geography to employ an idiographic approach that focused on the unique characteristics of areas. Schaefer held that this approach was bankrupt inasmuch as it had failed to lead to systematic generalizations from the mass of information regional geographers collected about particular places.

By contrast, the proponents of the new spatial science argued in favor of a nomothetic approach that would explain the diversity of places through the development of spatial laws (Amedeo and Golledge 1975; Bunge 1962; Schaefer 1953). Such laws were to be discovered through theory construction, model building, and mathematical and/or statistical analysis. *Geographical Analysis* was founded on these arguments, signaled in no small way by its bold subtitle: "An International Journal of Theoretical Geography." From its inception, the journal promoted a nomothetic approach to geography.

For those who adhere to the tenets of spatial science, there is probably little doubt as to which group prevailed in the debate over the relative merits of the general and particular positions (Burton 1963; Golledge et al. 1982; Gould 1979). In fact, even for geographers who acknowledged the usefulness of integrating the two (for example, Taaffe 1974), it was the general that assumed the dominant position in the binary hierarchy.

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Geographical Analysis, Vol. 27, No. 3 (July 1995) © Ohio State University Press

There are of course different readings of this debate (for example, Hart 1982; Hartshorne 1959), but perhaps even more interesting than one's position regarding its resolution is the persistence of the oppositional foundation on which it is based. For no matter how complacent one might be toward the seemingly tiresome division between the general and the particular, it simply will not go away. This is so much the case that we now find that the particular has gained ground on the universal—exemplified by Massey's claim that "the unique is back on the agenda" (1985, p. 19). In arguments more than faintly reminiscent of the debates in the 1950s and 1960s, spatial science finds the table turned: it is now criticized for its excesses in the search for the general. As the argument goes, spatial science collapses the complexity of social life under the weight of a universalist epistemology that privileges overarching theoretical statements and mechanistic methodologies over a contextual approach sensitive to the differentiated outcomes of complex social processes.

It should be emphasized that most of the critics are not arguing for a return to an empiricist, atheoretical regional geography (Entrikin 1991; Pudup 1988; Thrift 1983; Pred 1984; Warf 1992). Rather, in warning against the dangers of imposing rigid meta-narratives on the diversity of social life, they seek not to celebrate particularity, but to better theorize—and account for—the complexity of place (Gregory 1989).

One difference between the contemporary resurrection of the unique and its earlier formulation in much of regional geography lies in the attempt to negotiate the opposition between the general and the particular through reference to the now fashionable concept of "contingency." In its current form, contingency is conceived not as a residual category, that is, as a new linguistic veil for particularity, but as an intervention in a process caused by context-dependent differences within which that process is embedded. Contingencies interrupt the operation of processes, thereby producing different empirical outcomes in different contexts. In geography, the concept signals a diverse field of either environmental or sociospatial differences that intervene in the unfolding of more general processes. Methodologically, contingency suggests that researchers remain suspicious of any claim of *unmediated* determination. Suspended as a result are universalizing claims of transcontextual determination.

In two largely separate quarters of human geography, the task of constructing methodologies capable of confronting the challenges posed by contingency is well underway. These efforts, both of which have decidedly different origins and proponents, are explored in this paper. One, the expansion method, has its roots firmly in geography's spatial analysis tradition, particularly in that segment that seeks to validate theories through the empirical estimation of pattern-process models. The expansion method extends the range of questions within this research by offering a structured methodology for the interrogation of contextual variability in the parameters of mathematical and statistical models. Embedded within this methodology is a larger paradigmatic message: researchers should formulate theories and models only through a reflection on the substantive contexts from which they are conceived and thought to apply.

The pedigree of the other effort, scientific realism, is in analytic philosophy. Its aim is to facilitate theorization that bridges the divide between the concrete outcomes of social processes and the abstractions that accompany the construction of theory. Realism negotiates this division through its strong notion of contingency, through which it explains empirical outcomes.

What animates this paper is the fact that contingency is central to the expansion method and realism. Hence, both reject all claims of universal determination. Moreover, both share a faith in the value of abstraction and analytical

investigation, though on these issues there is some difference owing to their distinctive origins. In what follows we do not propose to collapse these points of disagreement, but rather to engage the strategies in a dialogue in the hopes of enlarging the methodological terrain of human geography.

The remainder of the paper is organized in four sections. In the one that follows, we describe what we take to be the key issues in the concept of contingency. This requires us to cast a historical eye to contingency, that is, to ask questions of its past uses and deployments. Having specified contingency through this historical analysis, we direct our attention to its development within several schools of geography. With the larger stage then set, we turn to a discussion of realism, directing attention to its main features and to its own theorization of contingency. The next section introduces the expansion method and its stance with respect to contingency. Afterwards, we attempt to establish a dialogue between these approaches by elaborating on their points of contact, while remaining sensitive to their differences.

2. CONTINGENCY IN CONTEXT

The term "contingency" appears to be relatively new in geographic literature. In most current use in geography, it signals the possibility of multiple outcomes derived from similar causal processes due to the complexity of social relations embedded in spatially differentiated contexts. These relations transmit processes with a difference, that is, they "interact" with the processes to create differentiated outcomes. However recent has been the term's popularity in the geographic literature, a close reading of programmatic statements in geography demonstrates that earlier scholars had an understanding of the process that now passes as "contingency." Yet with few exceptions (Entrikin 1991; Lukerman 1965), most scholars have failed to recognize these historical connections.

What accounts for the fact that contingency as a concept has a history in geographic thought? For one, contingency has been differentially employed in philosophical circles for some time (Lukerman 1965). Thus the process it seeks to describe is not an altogether new one. Second, the concept is bound together with a number of historic dualisms that have had a profound effect on geographic thought. Most relevant among these is the opposition between the general and the particular, though contingency is also related to such concepts as the idiographic and the nomothetic, the abstract and the concrete, the global and the local, and the theoretical and the descriptive. In order to explore these issues, we first place contingency within a wider historical perspective; this involves a lexicographic analysis of contingency through which we differentiate among several possible meanings. We then examine the meaning of contingency within the more specific contours of human geography.

Historicizing Contingency

To be contingent, at least since the fourteenth century, is to touch together, as in the Latin, *contingere*. Yet history has witnessed many more nongeometric definitions and uses of the term. Those reproduced in Table 1 were drawn from the *Oxford English Dictionary* and were categorized into clusters to facilitate an historical evaluation of the term. For each of these categories, we raise questions regarding its relationship to contemporary discussions.

In the first categorization shown in Table 1, contingency denotes accidentalness or chance, corresponding to the impossibility of knowing how history (or, presumably, geography) will unfold. Contingency as indeterminacy marks the unpredictability of events, revealing not simply the limits of prediction, but

TABLE 1
Selected Uses of Contingency

1. Contingency as Indeterminacy	
	Things in contingencye are never more than probable (Wentworth 1635)
	By contingents, I understand all things which may be done and may not be done, may happen or may not happen, by reason of the indetermination or accidental concurrence of the causes (Hobbes 1656)
	Contingence is blind, and does not pick and choose for a particular Sort of Events (Edwards 1754)
	This contingency, this efficient nothing, this effectual No-Cause (Edwards 1754)
	Any thing is said to be contingent or to come to pass by Chance or Accident, in the original meaning of such Words, when its Connection with its Causes or Antecedents, according to the establish'd Course of Things, is not discerned (Edwards 1754)
	*Twas a matter of contingency, which might happen or not (Sterne 1765)
2. Contingency of Truth	
	Discovering the validite of everie reason, bee it necessary, whereof cometh science, or contingent, whence proceedeth opinion (Fraunce 1588)
	A true axiome is Contingent ... when it is in such sort true, that it may also at sometime be false (Spencer 1628)
	The truths attested by our senses ... are contingent and limited to time and place (Reid 1785)
3. Contingency versus Necessity	
	Columbus did not find out America by chance, but God directed him ... it was contingent to him, but necessary to God (Burton 1621)
	Others admitted absolute necessity—no contingency—no liberty (Hamilton 1847)
	If his omniscience enables him to know them, what think you of the Contingency of human actions? (Watson 1796)
	Call those things ... which are liable to change and motion, contingent natures; and those which are not liable, necessary natures (Harris 1744)
	Beneath the play of contingency in the phenomenal world, there is an absolutely necessary Being in the intelligible world (Caird 1877)
	There can be no Contingency in their Actions, because all Volitions are determined by a Necessary antecedent Understanding (Cudworth 1678)
4. Contingency as Dependence	
	The operations of the Thinking Faculty are also contingently modified by the coexistence of other powers and affections of the mind (Bowen 1864)
	1st event; certainly happens, and gives either H or T ... 2nd event; does not certainly happen, but is contingent upon the first throw being T (De Morgan 1838)
	The contingency of the results is so great, that definite relations of antecedents and consequents cannot be established (Spencer 1873)

Source: Adapted from *Oxford English Dictionary*

also of explanation. In this sense, we might say that contingency as indeterminacy is little more than a repository for what cannot be explained. While this understanding makes possible the further refining of theory and methodology so as to draw some contingencies into the category of the determined, in retaining an oppositional form it nevertheless preserves the unexplainable as a category unto itself. As such, this form of contingency is a weaker and less useful concept than most would be interested in purchasing.

The second category of contingency shown in the table revolves around the question of truth. For these commentators, contingency marks the boundary between true knowledge, which is linked to necessity and science, and false or contextual knowledge, which varies according to opinion or to time and space.

In contrast to contingency as indeterminacy, contingency of truth raises questions concerning the possibility of transcontextual, or *True*, knowledge. In this instance, one finds resonance with contemporary strands of thought that are suspicious of complete or certain knowledge (Lyotard 1984). However, what on one hand seems to be a powerful motor for negating universality (that is, the impossibility of True knowledge), appears on the other to be of less utility inasmuch as it remains silent on the question of *how* we might theorize contextuality. In other words, it is one thing to refuse the general, it is quite another to theorize the particular.

The third category of contingency offers a little more understanding on this issue. In it, contingency is conceptualized vis-à-vis necessity. In the historic meanings shown in the table, the latter is conceived of as an all-powerful, trans-contextual force against which is posed the dynamic contingencies of human action. Not surprising given the historical context, the opposition is often directed toward the question of free will over-and-against an all-determining deity. Still, when read against the grain of more contemporary theoretical debates, the formulations shown in the table are suggestive of the much discussed polarity between social structure—as necessity—and human agency—as contingency (for example, Gregory 1981; Thrift 1983).

Realism has itself figured prominently—though by no means solely—in these discussions, for the source of contingencies in realism is often traced to agency-led interventions in the unfolding of social processes (Sayer 1992). The alignments are not perfectly homologous, however, for social structures may be conceived as not only necessary, but also contingent [see, for example, the realist inspired debates over capitalism and patriarchy in Foord and Gregson (1986) and McDowell (1986)]. In contrast, the contingency *versus* necessity opposition described here points to only one source of contingency—human freedom—and it does so in such a way as to thwart their potential integration. In other words, when based on a hermetic opposition between freedom and domination, contingency loses explanatory capacity beyond that which resides in individual will.

The fourth category shown in the table—contingency as dependence—shows still a different meaning. Present in each statement is a concern for causal connections, and for the question of how to conceptualize the ordering of causal powers. This strong understanding of contingency suggests a causal intervention that *follows*, but is no less important in determining outcomes. In terms suggestive of realism, this form of contingency implies a

connexion between two or more processes, such that the circumstances of one are likely to throw light on the others, in which case that first enrolled is considered a *leading process*, to which the others may be remitted *ob contingentiam*. (*Oxford English Dictionary*, p. 825; italics in original)

Thus in Table 1 we find Bowen arguing that the "Thinking Faculty," or reason, is modified by the coexistence of other powers of the mind; De Morgan identifies outcomes that are dependent upon a prior event; and for Spencer, the complications of contingency may be so great as to make difficult the establishment of definite relations.

It is the attention paid to the ordering of determinative processes that makes this meaning the one which we wish to emphasize here. In contrast to contingency as indeterminacy, contingency as dependence registers a faith in the decidability of diverse social outcomes produced under contextually varying conditions. These outcomes are dependent on the coexistence of other conditions; in no sense can they be read as having espoused an ontology of *chance*. The intent,

rather, is to order the determinative processes. Nor is there anything in contingency as dependence that would embrace the impossibility of knowing, as found in the second meaning, contingent truth. To clarify this difference, the outcomes of processes may be contextually dependent, but they are not dependent on the context of subject-object relations within which they are examined (on this hermeneutic point, contemporary notions of contingency are more or less agnostic). Thus, against contingent truth, contingency as dependence preserves the possibility of knowledge. Nor, finally, does contingency as dependence negate the possibility of the contingency of human action (as in contingency versus necessity). Instead, it subsumes contingent human action within the concept of dependence without being reduced to it. Thus contextual dependence can arise from two sources, that due to the contingency of practical activity and that due to the contingency of structures within which that activity is embedded.

Specific to geography, contingency as dependence implicates place in the production of contingent outcomes to any social process. In other words, place contexts—with their differences in social, political, economic, and environmental characteristics—are obvious *locations* for the production of contingencies. Contingent results emanating from these differences would imply, in turn, a *geography of determinations*, and hence a limit to the derivation of transcontextual theoretical statements. Causal generalizations in geography would always be bound by the operation of contingencies; any so-called universal would therefore be particularized by context. And it is on this point that we are led to investigate some historical and contemporary deployments of contingency in geography.

Contingency in Geography

Let us preface our survey by placing it within the context of the general and particular dualism. Contingency as dependence, as we have shown above, implies limits to the explanation of differentiated outcomes under the weight of law-like statements. At the same time, however, contingency refuses the “merely” particular, for it retains an interest in determinative social explanation. In this view, contingency suggests a stance toward the general and particular that is not *either/or*—but *both/and*. Rather than dismiss one or the other of the general and the particular, contingency holds them in constant tension. On one hand, the limits to universality that constitute the central message of contingency as dependence are grounded in an ever present particularity of place-based social relations. On the other hand, contingency as dependence also avoids the hyper-particularity of mere difference through its concern to order determinative processes. Still, by *both/and* we do not want to suggest that contingency lies in a comfortable middle ground between the general and the particular. Instead, by contingency as dependence we wish to stress the *particularization of the general*. In so mediating the opposition, this view rejects one-sided stances in favor of a position that holds that both the general and the particular are necessary elements of social explanation.

Given the trenchant character of the general versus particular dualism in geography, we might not be too surprised to find the concept of contingency in the historical record of programmatic writing in geography. This is especially the case in the Vidalian tradition, for, as Lukerman notes, contingency was the “controlling precept” (1965, p. 129) of French geography. Lukerman’s historical analysis reveals that French geography’s understanding of contingency was influenced not only through interactions with French philosophers and mathematicians of the nineteenth century, but also by the prevailing holism that dominated French intellectual thought at the time. This holism resisted the sep-

aration of geography into distinct subfields (for example, physical and human); it also required deploying the concept of contingency to better comprehend the relations between the parts and the whole:

any part of the whole is "dependent upon," and has value only in terms of, all other parts of the whole; that is, theoretically, every event in the world is conditioned by every other event in the world, past and present. Practically, then, any event is the result of a number of causal chains intersecting at some point in time/space. The event is caused, but nevertheless not determined [as by a law]; rather it is contingent on the indispensable but fortuitous intersection in time/space of multiple chains of causation. (Lukerman 1965, p. 130)

Lukerman goes on to describe contingencies in terms of probabilities. All events are caused, he argues, but to explain them one must make recourse to coincidental conjunctions of contingencies. This leads to the following resolution of the general and particular:

Individual events, in their range and variety, are explainable only in the chance intersection of mutually independent causal series. But, in the aggregate, individual events are probable and lawful as regularities of the observed frequencies of these same events. (Lukerman 1965, p. 134)

While much of Lukerman's interpretation is consistent with an understanding of contingency as dependence, the above passages do raise questions about the possibility of identifying regularities in contingencies. This is a point to which we shall refer later in our discussion of realism and the expansion method; suffice it to say for now that Lukerman's proposal, though distinct from contingency as indeterminacy, nevertheless holds little prospect for systematizing the analysis of contingencies.

Turning now to the German tradition, we offer a citation from Alfred Hettner, who, as Schaefer notes, grappled with the general and particular divide in geography:

We cannot say that similar conditions produce everywhere and always the same effects. Such a statement would ignore the fact that people differ and therefore can act differently under similar natural conditions . . . Also wrong, of course, would it be to say that similar people act alike under different natural conditions. There are no absolute relations between man and environment which are valid for all time. (Hettner, quoted in Schaefer 1953, p. 240)

In the first part of this passage, which was translated by Schaefer, Hettner appears to do little more than offer a corrective to strict environmental determinism (cf. Platt 1948), and in this sense the statement is not inconsistent with contingency versus necessity (the third meaning in Table 1). But this leads him, in the final sentence, to specify that there are no "absolute relations" valid for all time, a thought consistent with the notion of limits to universality in contingency as dependence. However, in quoting Hettner, Schaefer fails to articulate a concept of contingency; his approach remains consistent with an either/or understanding of the general and particular.

Hartshorne, whose views on geography were strongly influenced by Hettner, reveals multiple understandings of contingency. On one hand, for him particularity was the result of complex interrelations in areal settings, and as such particularity was not distinct from a residual category that resisted incorporation into larger universal statements. As he put it, "though science strives for universals, these do not exhaust the study of reality, there is always an individual remainder that is not described or explained" (1939, p. 378). This view can be

interpreted as contingency, but only in the sense of the first usage described in Table 1, above.

On the other hand, Hartshorne's understanding of geographic reality as inter-related phenomena in space and time leads him to suggest methodological strategies to deal with complex integrations, and some of his thinking along these lines is not inconsistent with contingency as dependence. As he notes, the absence of laboratory conditions in geographic study makes it necessary for the researcher to hold constant various semi-independent factors so as to highlight a particular set of areal relations. Thus for him, the purpose of dividing space into regions is to control for the effects of local differences on the causal relations under investigation. In other words, if our understanding of one integration—or set of areal relations—is complicated by other factors or other integrations, then regional study permits the enforcement of *ceterus paribus* conditionality. As he put it in *Perspective on the Nature of Geography*:

The purpose in dividing the area is to secure areal sections, or "regions," such that within each region the elements . . . under study will demonstrate nearly constant interrelations. (Hartshorne 1959, p. 129)

It should also be emphasized, however, that the perceived need for *ceterus paribus* conditionality does not necessarily imply the recognition of contingency as dependence. Such conditionality merely implies the need to control for external factors. It leaves open the question as to whether that control is directed toward a causal process, in which case one is attempting to control for or hold constant a contingency, or is merely directed toward other factors thought to effect the phenomena of interest, in which case one is attempting to control for the operation of other variables. In this latter sense, *ceterus paribus* is akin to statistical control in multiple regression analysis; in the former sense, it implies an attempt to control (or, in the expansion method, to account for) one or more of the causal relations influencing the object of analysis.

Hartshorne's use of the term "interrelations" in the above quote suggests that he recognizes contingent effects on processes, even though his regional method would—perhaps unwittingly—prevent him from identifying what they were. In any case, it was Hartshorne's contemporary, Preston James, who seems to grasp most clearly that geographic contexts intervene not simply on phenomena, but also on the relations they maintain with other phenomena. In an early statement of contingency as dependence, James offers that geography examines

the operation of processes in particular places. It focuses attention on the modifications in the operation of processes by the other things that are not equal, by noting the actual operation of processes in particular places modified by the presence of other things unsystematically associated there. (James 1952, p. 222)

James' corrective—*ceterus imparibus*—is consistent with a contemporary understanding of contingency inasmuch as it focuses on modifications to processes, and not simply on the effects that other variables have on the phenomena of interest.

Nevertheless, comments such as the above are rare in the regional literature, and thus it comes as little surprise that spatial science largely succeeded in characterizing areal differentiation as mere description. Indeed, some of the earlier reactions against regional geography baldly worked the either/or opposition of the general and the particular. For example, in reviewing the problematic under a subsection titled "The Impossibility of Compromise on the Issue of Uniqueness," Bunge writes: "Only by the complete rejection of uniqueness can geography resolve its contradictions" (1962, p. 13).

Later commentators, especially those writing after the watershed shifts in

thought of the early 1970s, were more sanguine over the possibility of eliminating particularity from geography. Many, for example, would affirm the 1974 comments of Rein, who King quotes as follows:

there are no general laws in social science that are consistent over time and independent of the context in which they are imbedded. The search for law-like generalization of cause and effect relationships is an illusion. Any particular patterning of events will not remain stable for very long, and generalization about them cannot provide a firm theoretical basis for intervention. (M. Rein, quoted in King 1976, p. 304)

Nonetheless, the simple recognition of the futility of transcontextual social laws does not itself provide the basis for an alternative research program. One of the first to offer such a program in geography was Taaffe (1974), who argued for a productive engagement between spatial scientists and regional specialists. The former could provide general theories, concepts, models, and advanced analytic tools, while the latter would offer locally sensitive assessments of their applicability to particular local contexts. In this process, Taaffe seeks to particularize the general theories and models of spatial science. Both aspects of geography would, he argues, be enhanced through such productive interaction (also see Taaffe and Casetti 1990).

Despite these trepidations toward the general on the part of spatial scientists, it was their critics who eventually measured highest on the yardstick of context sensitivity. Initial impulses in this direction resulted from the attempts to "spatialize" marxist theory during the 1980s (for example, Harvey 1982; Smith 1984; Soja 1980). As Peet put it in an early account:

Different processes occur in different places imparting characteristics to those places—for example, different modes of production generate economic and social landscapes that are greatly different. Also the same process operates somewhat differently under differing environmental circumstances—for example, the socialist mode of production is yielding different landscape forms within and between socialist countries. These geographic variations give a strong spatial weight to social process, so much so that we can speak of *spatial* processes. (Peet 1977, pp. 21–22; italics in original)

The effect of such thinking was not only to integrate space into theories of capitalist development, it also pointed the way for "locality" studies of how such development unfolded differently across sociospatial contexts. The result was a research program concerned with the specificity of process in particular contexts.

One of the most influential works in the development of this line of thought was Massey's *Spatial Divisions of Labor* (1984). The book focuses on the differential effects of economic restructuring caused by the intersection of local employment conditions and social relations. Contingency is thus understood as a locally grounded difference that intervenes in a larger process. For her:

Local uniqueness matters. Capitalist society, it is well recognised, develops unevenly. The implications are twofold. It is necessary to unearth the common processes, the dynamic of capitalist society, beneath the unevenness, but it is also necessary to recognise, analyse, and understand the complexity of the unevenness itself. Spatial differentiation, geographical variety, is not just an outcome: it is integral to the reproduction of society and its dominant social relations. The challenge is to hold the two sides together; to understand the general underlying causes while at the same time recognising and appreciating the importance of the specific and the unique. (Massey 1984, pp. 299–300)

Massey's empirical work on economic change in the United Kingdom explores the relation between local specificity (particularity) and large-scale restructuring (general processes). As she puts it,

part of the necessity of empirical analyses results from *geographical variation in the operation of economic and social processes* and from the particular local combinations and local developments of those processes which go to make up the uniqueness of place. (Massey 1984, p. 56; italics added)

In summary, numerous authors have highlighted aspects of contingency as dependence in their programmatic statements. Still, it was not until the introduction of realism to geography (Sayer 1984) that the language of contingency came to be specified in both theoretical and methodological terms. It is to this literature that we now turn.

3. CONTINGENCY AND REALISM

Realism is a structured approach to theory and method that is designed to aid scientific explanation. It takes as its point of departure the existence of real, concrete objects and events in the social world. These are assumed to exist in a finite complexity with their causes or determinants. The task of realism is to untangle the relations between objects and events and the forces that produce change from those that do not.

Importantly, realism holds that causal mechanisms must always be theorized contextually. In other words, those mechanisms that are found to determine change in one situation cannot be assumed to govern in others. This is because objects existing in social systems undergo both quantitative and qualitative change that alters the relationships between the forces that produce change and the objects themselves. Thus, not only the objects, but also the conditions under which social change occurs is theorized as dynamic in realism. To realists, this implies that social systems are "open"; in other words, the conditions that determine objects/events in one context are potentially modified in other settings or time periods. Not least among the reasons for open systems is the fact that people can learn, reflect upon, and alter their response to social conditions (Sayer 1992). In complex open systems, therefore, we not only expect concrete objects of study to have multiple determinants, we also expect those determinants to have different capacities for effecting change in different contexts.

In contrast to open systems in realism, a closed system is one in which the qualitative character of its component parts does not change and the conditions under which the system's mechanisms operate are stable. In such cases, as in the laboratory or in certain natural systems, the particular context of any research should be irrelevant. However, in open social systems this is clearly not the case. Realists therefore argue that social science is by its very nature a contextual science, since it is rarely possible to understand human action without reference to its particular context (Sayer 1989, 1992). In short, contexts produce particular processes, knowledge, interpretation and meanings in specific time-space settings.

Inasmuch as realism retains a strong notion of causality, it requires a conceptualization of the powers required to produce change. To realists, this involves a theorization of the causal powers of objects by reflecting on their cause-producing properties. This is accomplished by a method of abstraction in which the complex, multidimensional nature of objects is progressively disassembled to reveal those connections or relations that explain how objects come into being and are subsequently transformed. Realism does not restrict its attention

to the observable, empirical events of everyday life, but rather attempts to identify those forces, largely unobservable, that produce such objects. It assumes that the objects of study in social systems are interlocked in a structure of social relations, and that any attempt to understand social systems, including their geography, must identify the mechanisms that govern the interdependencies among those connected objects.

Of primary interest to realists are those internal relations or mechanisms that necessarily bind objects together. Such necessary relations are key to explaining the nature of change in any system, since the underlying structure of social relations or systems of social practice is essential to understanding the mechanisms necessarily determining human action (Sayer 1992). Necessary relations or mechanisms must always be present to effect change, but how many of them are activated and which of them are modified by the specific conditions existing in a particular setting will vary among contexts.

Any process that mediates between the operation of a general, necessary mechanism and a particular context in realism is a contingent relation. Concrete objects that are more context dependent are influenced by a greater number of or by more powerful contingent relations. Identifying the manner in which contingencies intervene upon necessary mechanisms in particular contexts is assumed in realism to be an empirical question that only can be answered by undertaking theoretically informed concrete research. Concrete research, therefore, serves two mutually reinforcing functions: one, to serve as the starting point for abstraction and the identification of necessary mechanisms; and two, to identify the operation of contextually situated contingencies.

Although contingent relations are regarded as external rather than internal in realism, they too must have internal, necessary causes, which may themselves be dependent on other contingent relations (Sayer 1991). Furthermore, a relationship of one form (that is, necessary or contingent) at a given level of abstraction may take on another form at another level of abstraction. For example, Sayer (1991) argues that capitalism and patriarchy may be contingently related at a high level of abstraction (for example, at the level of the mode of production), while this relation may be necessary at a lower, more contextually differentiated level (for example, neighborhood politics). It may be appropriate, therefore, to reconceptualize the general-particular continuum [or the abstract-concrete hierarchy; see Cox and Mair (1989)] as itself having a nested structure, in which the contingent processes at each level are themselves conceptualized in terms of a continuum of necessary and contextual explanations (or levels of abstraction).

The relationship between the abstract and the concrete in the study of social systems can be demonstrated in Figure 1. At the base of the diagram is the concrete social system to be conceptualized. The process starts at the top of the diagram with the most basic general principles of social systems. Examples of such abstract principles are concepts of people and nature, concepts of social and spatial structure, and concepts of social production and reproduction. The concepts are general in the sense that they are not contextualized with respect to either space or time. As we move down to the next level, the abstractions become contextualized and their specific forms are determined by various contingent conditions. It is at this stage that specific and general concepts meet, and where contingencies begin to modify necessary mechanisms. The intersection of these two, as we showed earlier, is hierarchical, in that the general, necessary relations at successive levels are mediated by the increasing influence of contingencies operating in more specific time-space contexts. The result of the intersection of the necessary and the contingent is an array of concrete concepts

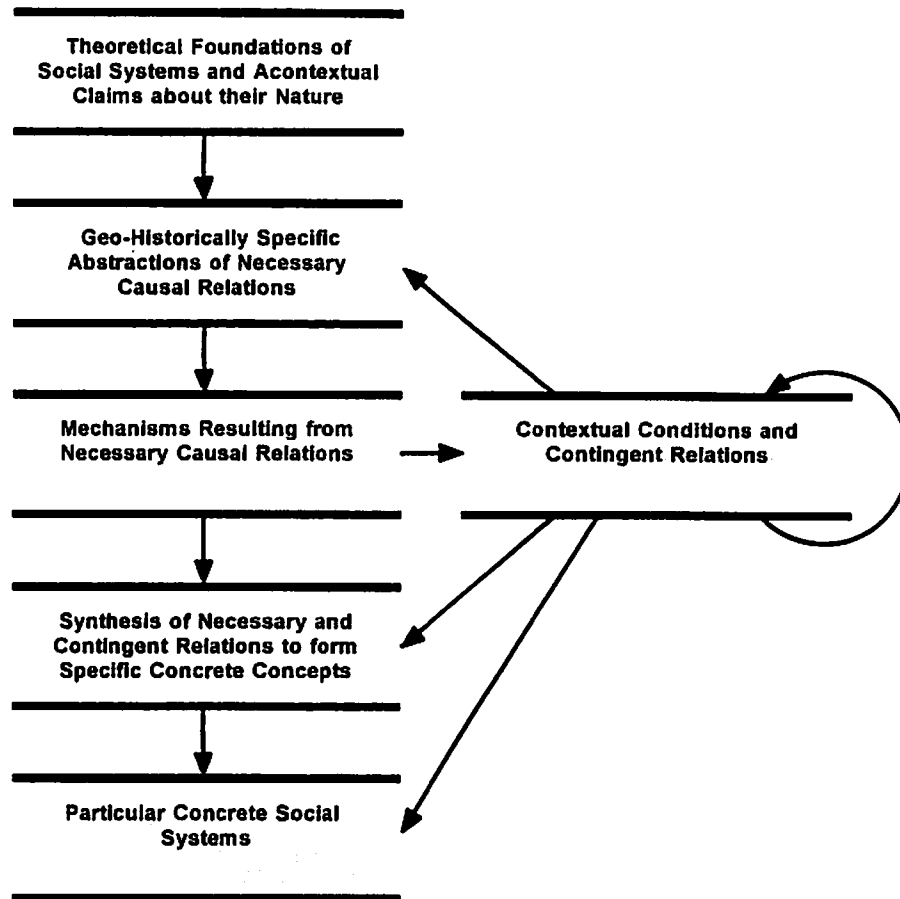


FIG. 1. The Relationship between the Abstract and the Concrete in Open Social Systems (adapted from Sayer 1992, p. 141)

which, when combined, constitute the concrete social system at the base of the diagram. Figure 1 also acknowledges the fact that contextually determined contingencies are themselves a product of contingently mediated necessary processes. Contingent conditions, even unique ones, must be explainable no less than generally occurring, necessary ones.

To illustrate this research approach, assume that we wish to explain why manufacturing firms in a North American region have restructured in different ways in response to increases in global competition and consequent downward pressure on profitability. To begin with, we would need to have an understanding of those abstract concepts relevant to the behavior of the firms. For example, we would need to examine the social relations of production, and we might also need to theorize relations of patriarchy, race, and ethnicity, the operation of the state, the relations between production and the natural environment, and the organization of spatial structure. Second, we would need to determine the general, necessary causal mechanisms that stem from all these structures within broadly defined historical and spatial contexts. For example, we could identify the way these processes generally work in a post-Fordist mode of production in a North American context. Third, we would need to examine the way that

more specific, contextually determined contingencies influence these general processes to produce concrete restructuring outcomes among the firms. Some of these contingencies may stem from the individual firms themselves (such as a firm's organizational structure, its level of technology, or the characteristics of its workforce), others will emanate from the regional context (such as labor market characteristics), and still others will stem from national or supranational factors (such as trade policy). Having moved from the most abstract to the concrete, and from a consideration of general, necessary mechanisms to the most contextually specific contingencies, we would then be in a position to explain the actions of individual firms in the region.¹

4. CONTINGENCY AND THE EXPANSION METHOD

When, in 1972, Casetti proposed the what he called the "expansion method," spatial science was still the dominant framework in geography. At that time, spatial analysis emphasized four clusters of activities: optimization, mathematical modeling, simulation, and data analysis. Though each differed according to the methodologies they favored, the questions they addressed, and the extent to which they employed empirical data, they tended to share an epistemological faith, namely, that to understand sociospatial diversity requires submitting it to orderly analytic investigation. This faith, however, resulted in an unforeseen consequence—an inattentiveness to contextuality. For in the heady era of spatial science, diversity posed no threat to theory and structured methodology (Bunge 1962). Thus, rather than theorize diversity, spatial scientists either assumed it away or sought to augment their accounting of it through an ever wider and more sophisticated range of techniques. In short, what was called for in the face of diversity was the imposition of more *order*, and the success of spatial science was measured along just such a trajectory.

In the expansion method, Casetti (1972) proposed to reverse this state of affairs. Read in the context of the above, the paper called for a reworking of models in the face of diversity, rather than vice versa. In other words, rather than ignoring diversity or constructing ever more elaborate models in the hope of taming it, the expansion method held instead that models must submit to contextual realities. Thus models, as well as the theories on which they are based, must be attentive to context.

To effect this shift, Casetti suggested the redefinition of an initial or acontextual model's parameters in terms of variables hypothesized to effect the relationships under investigation. The parameters selected for redefinition are typically chosen based on conceptual criteria: what, one might ask, would cause this particular relationship to vary from one situation to another? Having redefined the parameters of an initial model in terms of hypothesized expansion equations, the initial model could then be reconstructed through substitution to yield a terminal model capable of capturing the hypothesized drift in the original functional relation. When estimated, the terminal model could then be dismantled via the expansion equations in such a way as to empirically specify the context specific operation of the initial model's relationships (Casetti 1972, 1982, 1986; Jones and Casetti 1992). The resultant flexibility of such models to

¹ For space considerations we have omitted a discussion of a number of debates within realism that intersect with our conceptualization of contingency. Interested readers may wish to examine the following interrelated discussions: the charge of empiricism (Archer 1987; Cooke 1987; Gregson 1987; Harvey 1987; Sayer 1987; Smith 1987); the problem of scale (Cox and Mair 1989; Duncan and Savage 1989; Sayer 1991); and the role of space in realist explanation (Cox 1994; Cox and Mair 1988, 1989, 1991; Duncan 1989; Johnston 1993; Sayer 1985, 1992, 1994).

the diversity of various conditions highlights the contribution that a geographic perspective can have in inserting context into the traditionally aspatial models of the social sciences (Casetti 1993; Jones 1992; Taaffe and Casetti 1990).

It is important at this stage to place into focus some key differences between the expansion method and several methodological alternatives available at the time of Casetti's paper. First, the expansion method does not simply increase model complexity by adding additional variables in a regression format. Such an approach does not contextualize a model; it merely adds to the list of factors thought to account for the diversity of a dependent variable.

Nor is the expansion method equivalent to subsetting a dataset to determine how a model performs across different regimes of observations. Though this approach is consistent with a view of contextual determination, and can be profitably used to compare parameter estimates, it must be remembered that in such analyses one is also imposing limits: both on the number of cases included in any model and on the diversity of the dependent and independent variables. Indeed, the approach bears strong affinities to Hartshornian regionalization, inasmuch as it controls for outside factors by limiting the scope of areas under consideration. But to estimate separate model parameters based on such a division thwarts the purpose of identifying the sources of parameter variation. We can simply never know what underlies the variations that result from such a procedure.

A third alternative, one which bears more similarity to the expansion method, is the interaction of variables in regression models. Scholars such as Blalock (1965) had earlier on proposed interaction models to deal with a well-recognized problem, namely, that specific combinations of independent variables might have effects on dependent variables. Since the expansion method results in interaction models per se, Casetti's approach could be viewed as simply a procedure for their development. This, however, would be a misinterpretation of the expansion method. Interaction modeling was confined to a narrow range of problematics emerging in specific research contexts, which, on the basis of conceptual abstraction within the limited scope of the problem at hand, might suggest the necessity of interacting one variable with another. Moreover, such techniques, as well as analysis of covariance, were not articulated as a systematic procedure for investigating *parameter variation*. They were instead methodologies for revealing multiplicative effects on a dependent variable. But in turning attention to the instability or drift of parameters, as opposed to the interaction of variables, Casetti's expansion method focused attention on the problem of model variability across different contexts.

Over time, the empirical assessment of model parameter stability using the expansion method became linked to a wider set of theoretical issues. This linkage began to take shape as a result of research on a diverse set of substantive concerns guided by an array of unrelated theoretical frameworks. The range of applications, too numerous to specify here, included the spatiotemporal dynamics of economic growth, population and migration studies, urban land use and housing, economic production functions, public policy, social problems, urban systems, innovation diffusion, and others [see Casetti (1986) for a review; also, Jones and Casetti (1992)]. What was striking about these applications was the extent to which parameter variation was uncovered in models with firm theoretical grounding. Like realism would have predicted, few of the standard social-scientific models investigated in these studies were found to be stable *within* the range of observations selected for empirical study.

In light of these findings, there emerged an articulation of the expansion method "paradigm" (Casetti 1993; Jones 1992; Foster 1991; Taaffe and Casetti

1990). A paradigm in this sense is a metatheoretical and cross-substantive approach encompassing a research *philosophy*, a set of research *problematics*, and a set of *procedures* guiding their investigation. At the level of research philosophy, the expansion method suggests that we be skeptical of any research program that claims, assumes, or seeks to identify transcontextual processes. The various applications of the expansion method suggests that such processes do not exist. It offers, instead, that theories, models, and hypotheses must be ceaselessly interrogated both across and within application contexts. The assumptions of invariance, applicability, and generality that guide most social science research are thus rejected in the paradigm. The paradigm argues that the research process must always be held "open" (Jones 1992), as any set of answers to questions of theory applicability must necessarily be followed by new questions.

The research problematics of the expansion method extend through virtually all social science models to form a cluster of interconnected questions. First among them is the following: what are the contextual dimensions of model parameter variation? In this question, one seeks to identify the sources of parameter instability by investigating the extent to which relationships are contingent with respect to (i) substantive contexts (for example, Jones and Kodras 1986); (ii) spatial locations (for example, Jones 1984); or (iii) temporal coordinates (for example, Foster, Gorr, and Wimberly 1992). A second question is the extent to which model parameters vary in datasets in which variables have been collected at different scales. In some empirical applications, researchers may augment individual-level variables with ones collected at other scales, and in these cases one might uncover parameter drift in the former with respect to the latter (for example, Ellis and Odland 1992). Third, to what degree is a model's instability linked to the theoretical insularity accompanying its construction? This problematic arises inasmuch as the interpretation of findings from the first question above has required researchers to pursue other, previously unconnected, theoretical frameworks for explaining model instability (for example, Brown and Jones 1985; Kristensen and Tkocz 1994).

The expansion method as a technique constitutes the bulk of the set of procedures embedded within the paradigm. But this does not exhaust the range of methodological issues associated with it. Researchers have also investigated the relationship between the expansion method and spatial econometrics (Anselin 1988); heteroskedasticity and spatial autocorrelation (Anselin 1992; Jones 1983); Bayesian regression (Casetti 1992); mathematical modeling (Sonis 1992; Casetti 1995); multilevel modeling (K. Jones and Bullen 1994); and other methods for detecting parameter variation (Foster, Gorr, and Wimberly 1992; Hanham 1992).

Importantly, the search for parameter instability using the expansion method is equivalent to our definition of contingency as dependence, for varying parameters identify relationships that are unstable, or contingent, across contexts (Jones 1992). Such instability implies processes that "transmit" with a difference, based on substantive, spatial, or temporal criteria. Since the expansion method was both developed within and remains associated with the methodologies of spatial analysis, its understanding of contingency holds that such effects must be subject to systematic investigation. It therefore investigates contextual effects in a systematic, rather than ad hoc, manner. This is to say that the expansion method, by its very nature, tends to ignore contingent singularities, or contingencies of pure particularity and chance (cf. Lukerman 1965), searching instead for cross-contextual contingent relationships.

It is in light of the above that the expansion method shares one of the aims of

spatial science, for it too seeks order. But instead of ordering diversity, it seeks order in the particularities of generality. In other words, the expansion method recognizes the limitations of a largely acontextual spatial science, but in framing its conceptualization of diversity, it refuses the hyper-particularity of unsystematic contingency. Through the orderly investigation of the mechanisms that produce variations in general processes, the expansion method thus not only particularizes the general, it also seeks to identify regularities in these contingent effects (Jones 1992).

5. REALISM AND THE EXPANSION METHOD

It should be clear by now that both the expansion method and realism share a concern with the general-particular problematic, and that both deploy contingency to mediate between the opposition. However, they are quite different methodologies, especially regarding questions of theorization and causality, and these differences have implications for research that invokes concepts of contingency. Some of these differences may be irreconcilable, and proponents of each may well disagree over their larger commensurability. For us, however, there are interesting points of contact, which, if developed constructively, could be mutually beneficial. In this section, we outline some of the key differences and explore how a sensitivity to both realism and the expansion method may prove useful in geographic research (also see McHaffie 1992).

Our comparison of the two approaches is facilitated by realism's distinction between "intensive" and "extensive" research. The differences between them are highlighted in Table 2 (Sayer 1992). The table shows that intensive, realist-inspired research focuses on necessary and contingent causal processes in a limited number of cases. By contrast, extensive research, which is practiced in spatial science, focuses on taxonomic rather than causal groups and deals with a large number of observations. As we perceive it, this distinction raises two general issues. The first is a methodological one that relates to differences in the conduct of empirical research in realism and spatial science. The second is a theoretical issue, one which centers on conceptualizing and measuring social objects in realism.

Let us begin with methodology. Intensive research strategies emphasize contextually grounded case studies, qualitative measurement, and interviews. These are justified on the grounds that, as discussed above, social systems are viewed as open in realism. Inasmuch as contingencies intervene as causal forces in social systems, realists hold that the only way to uncover their operation is through intensive research methods. By contrast, positivists are said to operate under the assumption that social systems are closed. This assumption, a hang-over from the importation of natural science methods into the social sciences, relieves the positivist of the task of investigating whether causal processes vary from one context to another.

The importance of the concept of contingency for intensive methodology was forcefully made by Massey and Meegan (1985) in the context of economic geography. In their opinion, intensive and extensive research methods diverge significantly in their ability to address issues of contingency. However, as we have shown above, the expansion method was developed specifically to address this problem. In what follows, we quote extensively from Massey and Meegan so as to show that their understanding of the issue is in fact no different from that of the expansion method:

extensive research would expect a single national cause (say, changing interest rates) to affect all regions equally, any differences being due to the addition of

TABLE 2
Intensive versus Extensive Research (Sayer 1992, p. 243)

	Intensive	Extensive
Research question	How does a process work in a particular case or small number of cases? What produces a certain change? What did the agents actually do?	What are the regularities, common patterns, distinguishing features of a population? How widely are certain characteristics or processes distributed or represented?
Relations	Substantial relations of connection	Formal relations of similarity
Type of groups studied	Causal groups	Taxonomic groups
Type of account produced	Causal explanation of the production of certain objects or events, though not necessarily representative ones	Descriptive "representative" generalizations, lacking in explanatory penetration
Typical methods	Study of individual agents in their causal contexts, interactive interviews, ethnography. Qualitative analysis	Large-scale survey of population or representative sample, formal questionnaires, standardized interviews. Statistical analysis
Limitations	Actual concrete patterns and contingent relations are unlikely to be "representative," "average," or generalizable. Necessary relations discovered will exist wherever their relata are present, for example, causal powers of objects are generalizable to other contexts as they are necessary features of these objects	Although representative of a whole population, they are unlikely to be generalizable to other populations at different times and places. Problem of ecological fallacy in making inferences about individuals. Limited explanatory power
Appropriate tests	Corroboration	Replication

other factors which can be separately accounted for. Intensive research, in contrast, works on the assumption that the same national cause can produce very different effects in different regions/locations because of the way in which the factor in question is articulated in those locations relative to other factors. Thus a single national policy, like regional policy for example, may well produce one effect in one situation and a completely different effect in another precisely because of the way in which different processes interact. In one set of circumstances changing product and process technology within an industry, and trade union militancy on existing sites, may well encourage plant closure and transfer of production elsewhere. Yet in another situation, the perceived militancy of organized labor might well discourage companies from transferring work elsewhere and result perhaps in new capacity being added to existing sites. Desegregating the factors involved, into, in this example, regional policy, technical change, and trade union militancy would clearly not help in explaining the outcome. It is argued, from this position, that "factors" need to be conceptualized as *processes* and structured together interactively rather than just added up. (Massey and Meegan 1985, p. 9)

Given that the problem of methodology described above is equivalent to that addressed by the expansion method, it would then hold that *on this point* the dif-

ferences between intensive and extensive research collapse. And it follows from this joint conceptualization of contingency that realism and the expansion method might be profitably pursued as complementary research strategies. In this view, realist-inspired case studies could be carried out to identify contingencies in a limited number of contexts, while the expansion method could be deployed to assess the extent of these contingent effects.

One possible roadblock to reconciling these approaches, it seems to us, hinges on the question of how prevalent and systematic one holds contingent effects to be (Sayer 1991). If one subscribes to an ontology that views contingencies as largely unsystematic, that is, the chance result of the intersection of unrepeatable causal interrelations (Lukerman 1965), then one should rely on intensive research strategies. If one holds that the particularization of generality that underpins contingency can itself be systematically addressed, and even perhaps generalized, then the expansion method is an appropriate approach. If one remains agnostic toward the question of the systematic nature of contingent effects, then both approaches are suggested.

Let us now turn to theoretical issues concerning the relationship between realism and the expansion method. These largely hinge on realism's theorization of social objects as interconnected entities whose causal relations and powers can only be dissected through intensive research methods. There are several important critiques along these lines. First, realists critique positivist measurement strategies, arguing that they focus on formal relations of similarity and dissimilarity rather than on relations of connection and causality (Table 2). It is on this basis that realists claim that positivists underconceptualize their objects of analysis (Sayer 1982). Second, realists argue that objects of inquiry can undergo qualitative change that alters their cause-producing properties without attendant change in their quantitative measurement. In this view, the very meaning of some objects in social systems (for example, technology, the state, the built environment), as well as the relations in which they enter, may change from one context to another, and may do so independent of their numerical status (Sayer 1992). Third, realists critique the priority positivists assign to the search for empirical regularities. For realists, what causes an event to take place is not dependent on the number of times it has been observed, and when one observable event follows another it does not follow that they are necessarily causally related, for this could simply be a contingent matter (Sayer 1992).

The various applications of the expansion method are vulnerable to each of the above criticisms. At the same time, however, the critiques are largely directed toward positivist strategies of conceptualizing and measuring objects of analysis, leaving open the possibility that researchers might—in specific research contexts—employ quantitative measurements following rigorous qualitative causal analysis and careful specification of variables (Sayer 1992). Such work would involve, first, a theorization of the necessary and contingent relations thought to influence the objects of analysis, and second, an assessment of the extent to which measurements of them captured context-invariant relations of connection and interdependence. The former seems to pose no necessary barrier to integrating the expansion method and realism, for such theorization can take place prior to quantitative analyses (or to qualitative analyses, for that matter). The latter issue is more critical, however. It requires that quantitative researchers reflect upon various aspects of measurement, in particular, their cross-contextual reliability and the extent to which they reflect the earlier identified necessary mechanisms and contingent relations. If a case can be made that the measures in question satisfy these conditions, then it follows that exten-

TABLE 3
A Typology of Geographic Research

	Limited Cases	Multiple Cases
Relations of Similarity and Dissimilarity	Regional geography, emphasizing contingent relations in particular places.	Spatial Science, emphasizing contingent relations among many places.
Relations of Connection and Interdependence	Realist case studies, emphasizing contingent and necessary relations in particular places.	Realist-inspired expansion method studies of contingent and necessary relations.

sive analyses of them might shed light on the relations theorized [see Lovering (1985) and Morgan and Sayer (1988) for examples of realist-inspired quantitative measurement].

The role of the expansion method in various types of geographical research and its relation to realist methodology can now be clarified. We do so through Table 3, which presents a typology of geographical research along two dimensions. The first characterizes research according to whether one chooses to examine a limited number of cases or multiple observations. The second characterizes research according to whether it relies upon formal relations of similarity and difference or substantial relations of connection and interdependence. This is an adaptation of Sayer's (1991) distinction between research that focuses on the independent or interdependent nature of objects. The resulting typology can be used to characterize geographical research according to these two dimensions, as well as to demonstrate a potentially broader range of applications for the expansion method.

The top left cell in Table 3 represents research that is concerned with single cases and employs an approach based on relations of similarity/dissimilarity. Typical of this kind of research is traditional idiographic regional geography that emphasizes only the contingent relations in particular places. Neither realism nor the expansion method would seem to have much relevance as a methodology for this type of research. The bottom left cell of the table represents research that is also concerned with case studies, but employs realist theorization to derive measures of substantial connection. This characterizes locality studies and the new regional geography (Pudup 1988; Sayer 1989; Thrift 1983), which emphasize both the necessary and contingent relations of particular places. Realism has been a core methodology for research of this type, and it would seem that the expansion method would have only limited use here given its reliance on a large number of cases.

The top right cell of Table 3 refers to research that relies on multiple observations and a taxonomic approach toward the objects. Nomothetic spatial science typifies this research, with its emphasis on generalizing contingent relations across a range of locations. Realism would not be relevant as a methodology here, but the expansion method most certainly has been. The bottom right cell in the table refers to research that is also concerned with validation among a large number of cases, but theorizes the objects as interdependent. Examples of this type of research are theories of combined and uneven development, which emphasize both the necessary and contingent relations that a number of places may have in common.

For us, this last category of research is where both methodologies could be usefully conjoined. Realism's contribution would be, first, to theorize the underlying causal mechanisms by means of abstraction and conceptualization, and, second, to identify contingent processes through intensive study of a limited

number of concrete cases. Given the qualifications regarding measurement specified above, the expansion method could then be used to assess the extent to which the contingent relations modified necessary mechanisms [see McHaffie (1992) for an illustration]. In effect, the expansion method could be used to ascertain and measure the balance between the necessary and the contingent forces within realist-inspired theory.

To illustrate one possible application, recall the earlier example from our discussion of realism in which the concern was differential restructuring of North American manufacturing firms. Such a research project might seek to uncover the extent to which global competitive pressures affect firms, and how these effects vary from one firm to another. In such a case, a realist, no less so than a spatial scientist, would bear the responsibility of deriving measurements of firm restructuring. For the realist, these would constitute concrete events measured for firms, while in the expansion method such measures would constitute the dependent variable in a regression analysis. Assuming that restructuring could be measured (for example, by employment shifts or changes in wages and benefits), attention would then turn to the social relations of production as a set of necessary relations required to explain these shifts. Mechanisms emanating from these relations could then be specified. One might capture relations between capitalists through a measure of market share, while the relations between an individual capital and its labor force might be assessed by the ratio of profit to wages. In the expansion method, these would constitute the independent variables in the initial model.

The extent to which these relations were stable across a range of other contexts could then be investigated by expanding the parameters of the independent variables in terms of other substantive variables. Firm specific contingencies might include the level of labor force unionization, the gender and race characteristics of the workforce, or the firm's level of technology, while other measures might refer to the characteristics of the local labor market or regional employment policy. The expansions would be undertaken to mimic the hierarchical ordering of effects theorized in the process of restructuring (following Figure 1). Were contingent effects uncovered through the estimation of terminal models, the results might then be employed to guide further questioning using intensive research methods.

6. CONCLUSION

Since the 1970s geography has been increasingly compartmentalized along lines of theory, methodology, and politics. Eventually, this process can congeal into rigid systems of self-identification on the part of scholars who feel relinquished from the responsibility of tracking developments in other areas. This state of affairs, it should be emphasized, characterizes not just one research cluster in the contemporary landscape; it is relevant to all of them.

One of the purposes of this paper has been to bridge some of these divisions for spatial science and realism. This is not to suggest that these two approaches to social inquiry are collapsible one to another. Indeed, in our view the differences between conventional spatial science and realism are congruent with those shown in Table 2. However, spatial science through the expansion method also has a tradition of thinking about contingent effects, and as we trust this paper has demonstrated, in this regard it is not inconsistent with realism. By historicizing and making explicit these connections, we hope this paper has encouraged

scholars to be more creatively open to both approaches as they theorize and analyze contingency.

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