

Integration of Social Sciences in Modelling: An Interactionist Approach to Research Practice

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Abstract

Social modelling (the application of computational methods and techniques for analysis of social processes and human behavior) is expected to provide conceptual and technological tools for supporting the analysis and decision making in areas related to national/public security, political stability, law and order, and sociocultural changes. It seems obvious that the modelling of social and cultural processes needs to draw upon the knowledge obtained within social sciences – conceptual models, theoretical and cultural insights, and empirical data. However, it is not known yet how to integrate social scientific knowledge into modelling.

This paper aims to approach social modelling as an interdisciplinary research practice. The paper develops a concept of interdisciplinary research as a *social practice* and shows how an *interactionist* perspective can help identify problems related to the integration of social scientific knowledge in modelling. The discussion of these problems focuses mainly upon the research on political violence and related sociocultural processes, and is enhanced by the author's reflection upon work in an interdisciplinary team.

Conceptual Framework: Interdisciplinary Research, Social Practice, and Interaction

This paper is informed by symbolic interactionism, activity theory, sociology of science, discourse theory, semiotics and philosophy of technology, and draws upon a model of the object of interdisciplinary research developed within a system approach (Shchedrovitsky 1995). The model is based on three ideas. First, the researchers do not deal with an ontological object. They deal with the object's *representations* that are given to the researcher in the form of facts, empirical materials, models, ontological schemes, methods and techniques, and problem statements and specific tasks. Second, researchers working in an interdisciplinary area deal with multiple representations of the object. Third, those multiple representations are constructed within disciplines divided by strict boundaries, which makes the search of links between them a separate and, indeed, the main task of interdisciplinary research.

According to this approach, the concept of political violence as an object of modelling cannot be the same as the concepts of political violence developed in political science, sociology or any other discipline. Although social sciences seem to be a useful source of conceptual models and data, their heuristic significance (and suitability) for a study involving the application of modelling methods and techniques should not be taken for granted and needs to be justified. Therefore, the use of social research in modelling needs to be accompanied by the critical analyses of its epistemological and theoretical assumptions and methodological limitations.

The outlined approach represents the interdisciplinary research as an interaction between different fields of knowledge, as a conceptual activity. However, interdisciplinary research can also be approached as a *social practice* of knowledge production/consumption. It is conducted by people, for people, and in a specific cultural and organisational context. It is shaped (determined, limited, regulated, distorted, complicated, enriched) by individual and collective experience, interests and needs; social norms and values; and culturally specific worldviews and ideological biases.

To sum up, the process of the integration of social sciences in modelling can be approached as:

- interaction between different fields of knowledge;
- interaction between members of an interdisciplinary research team;
- interaction with the client/user and the society (public); and
- 'interaction' with the object of modelling.

These four dimensions of social modelling as an interdisciplinary research practice are outlined below.

Interaction Between Fields of Knowledge

In terms of the interaction between fields of knowledge, the issue of social modelling is approached differently by modellers and social scientists. Modellers formulate their requirements (the kind of social scientific knowledge that they need) and identify problems related to the use of data, the lack of conceptual links between social disciplines and the levels (scales) of analysis. Complaints can be heard about the absence of a single (general) social theory and attempts are made to apply rigorous methods to an analysis of phenomena that have always been within the qualitative social research area. Social scientists question these requirements and are critical of these proposals. At the epistemological level, the social scientists tend to highlight the properties of social systems that make the application of methods developed in natural sciences difficult or impossible. At the case studies level, they produce research that, while illuminating the modellers on certain aspects of social reality, can re-enforce an argument that the objects of social research are unique and too specific to be modelled.

The modellers' 'demands' are often shaped by a positivist philosophy and they are often unable to state their problems and questions in a way that enables the social sciences to provide answers. There are, nevertheless, some attempts by the social scientists to provide knowledge that modellers can use. However, there are no noticeable indications of social scientists' desire to formulate alternative demands. Apart from some areas in which quantitative methods are used, social scientists do not need the modellers' help for the exploration of phenomena such as the emergence of political violence. Meanwhile, the formulation of such needs can facilitate the integration of social sciences and modelling within an interdisciplinary research practice.

A more extended analysis of the modellers and social scientists' views upon this issue has been made elsewhere (Resnyansky 2007). This paper outlines some examples showing why a social scientist involved in qualitative research might need to cooperate with modellers, and discusses some problems related to the interaction between disciplines at the level of concepts. These issues are discussed with reference to the following topics: multiculturalism and radicalisation in western democracies; community-based research on social integration; and threatening identities.

Radicalisation, Political Violence and The Role of Multiculturalism: a Need for a Systematic and Comprehensive Analysis of Multiple Factors

The policy of multiculturalism is considered to be particularly important in the context of the emergence of radicalised groups and individuals in democratic nations. Specifically, multiculturalism is thought to be one of the major factors contributing to the slow integration of some

immigrant groups into the host society. However, theoretical speculations focus mainly upon particular versions of the policy of multiculturalism and explain such processes as radicalisation or political violence by the 'properties' of multiculturalism – as policy makers formulate them. It is necessary, however, to be aware of the possible transformations that this concept can undergo in practice.

Different actors can assign different meanings to *multiculturalism*, which may result in unexpected effects – for example, in some western nations the concept of multiculturalism can be employed to support projects such as creation of a unified Muslim community. It is, therefore, necessary to examine the specific versions of multiculturalism in relation to the concrete conditions in which it is implemented. The history and culture of the host society and the immigrant groups is believed to be relevant, as well as a current social and political situation and the factor of time (which is largely ignored by social researchers and modellers). Only such a systematic and comprehensive assessment can help reveal the significance of specific factors. This assessment can also be usefully informed by comparison of the factors affecting upon immigrants' integration or youth radicalisation in different countries and historical periods. It is difficult to conduct a comprehensive assessment of multiple factors 'manually' (with qualitative research methods). Rather, this task requires approaches, methods and techniques developed in modelling.

Community-Based Research on Social Integration: a Need for Universal Categories

Exploration of such processes as radicalisation and political violence often draw upon immigration studies conducted within community-based research on social integration. Such studies, however, should be used with caution. The concept of community implies that social actors are unified on the basis of local solidarity, and the role of this type of solidarity has become insignificant already in the industrial age and does not seem to work in the post-modern urban environment. The community-based research may present an ideal theoretical concept as a reality. This research, therefore, cannot be approached as a source of scientific knowledge (facts and insights) – rather, it needs to be explored as a social practice of the legitimisation and naturalisation of certain discursive constructs (as well as sociocultural and ideological projects) in public consciousness.

By making the community a unit of analysis, the community-focused research implicitly suggests that other types of social solidarity are not essential. In order to explicate all factors affecting the immigrants' integration, the community-based research needs to be complemented with data representing other kinds of social ties that individuals may have established, including those with the

broader society. This paper suggests that an analysis of the processes of social integration in contemporary society requires concepts that are less culturally and ideologically loaded, such as the concept of social network. Adoption of this concept allows the social researcher to employ methods and techniques developed within such a rigorous approach as social network analysis (see Falzon 2006).

It needs to be noted that there are no 'universal' categories in social sciences. Even the seemingly universal categorisation of population in socio-demographic terms cannot be taken for granted. This categorisation was developed for specific purposes and its usage for an analysis of such phenomena as, for example, the emergence of political violence should be justified.

Threatening Identities: a Problem of Linking Different Levels of Analysis (The Intermediary Concepts)

Currently, the emergence of political violence is explained either from the perspective of psychology or at the level of such concepts as *culture* and civilization. The uncritical acceptance of the culturalist analytical framework may, however, result in the overemphasising of the role of religion in social processes, including radicalisation and political violence. Other important factors may be underrated and disregarded, such as the influence of socio-economic conditions and local sociocultural contexts. The explanatory potential of the culturalist (civilizationist) paradigm that is currently dominant within the popular political discourse needs to be assessed in comparison to the models based upon a systemic structuralist paradigm. The different perspectives can be linked through such intermediary concepts as *identity*. This concept allows linking societal conditions, cultural resources, specific loci and channels of spreading identities, and target groups and interested actors. The advantage of this approach is that it focuses upon concrete ways of identity formation, which can help undertake constructive actions preventing the formation and spreading of threatening identities.

A Need To Link Different Representations of Reality – a Search for General Conceptual Frameworks

In order to establish links between different representations of reality constructed within particular disciplinary areas and discursive practices, general conceptual frameworks need to be developed. It is suggested that such social theoretical concepts as *system*, *structure*, *activity*, and *interaction* can inform this task. For example, the concept of activity may help re-interpret diverse data in unified terms and link specific studies of social processes. At the same time, it may be in accordance with the latest developments in social research in regard to the process leading toward identity formation and, therefore, the conditions of the emergence of groups that may be involved in radicalised or violent movements.

Interaction Between Members of an Interdisciplinary Research Team

Interaction between fields of knowledge is just one aspect of social modelling as an interdisciplinary research practice. This practice can also be approached as an interaction between members of a research team. Existing studies of the human interaction and communication within interdisciplinary research environment emphasise the mundane nature of such interaction and the importance of tacit factors and emphasise that the concrete forms of interaction/communication are specific for institutional settings and situations. There are also attempts to identify factors and issues to be addressed for successful interaction, such as the importance of mediators and facilitators. The provided recommendations are, however, either too general or too case-specific. This paper outlines some aspects of the interaction between modellers and social scientists, focusing upon communication roles and relationships, communication problems and education/collaboration as a practice of solving those problems.

Roles and Relationships

Social modelling is an interactive process that cannot be reduced to a one-way exchange of information (a 'demand & offer' kind of relationship). Ideally, the parties involved should be equal partners. It does not seem right if, for example, the modellers are positioned only as demanding information, while the social scientist's role is that of providing subject matter expertise. First, in order to provide such expertise, it is necessary to understand how this knowledge is supposed to be used. Second, as the previous section shows, the integration of social knowledge into modelling is possible if that knowledge has undergone certain transformations, which means that the social scientist becomes more than just a reference source. In short, the integration of social scientific knowledge in modelling can be more successful if both the modellers and the social scientists are interested in acquiring each other's help.

Communication

Communication within an interdisciplinary team can be approached as comprising two kinds of activity: an exchange of information/knowledge, and a support of 'team awareness'. The activity of information/knowledge exchange has two aspects: semantic (understanding terms) and semiotic (the use and perception of knowledge represented via particular mode).

The majority of communication problems of semantic nature seem to emerge because members of an interdisciplinary team assign different meanings to terms. This problem cannot, however, be solved simply by looking for definitions in sociology dictionaries. The 'translation' of social scientific concepts into the modelling language requires a 'shared background'; the latter needs

to be constructed, which can be done via the processes of education and collaboration. This observation can be illustrated by the attempts to develop a concept of distance to be used in the modelling of social influence. The initial concept of *distance* as a geographical (spatial) distance between individuals has been criticised for being too context-specific; the concept of social distance (hierarchy, solidarity) has been introduced and attempts were made to develop a more complex formula to include social division and hierarchy. Due to the emerged complexity, it was suggested that social distance needs to be converted into geographical distance, and the Bogardus spatial metaphor for the perception of social distance has been explored. This provided an opportunity to highlight the cultural and ideological loading of social research. The outcome was that both geographical and social distance can be relevant but their relevance is different, depending upon: (1) the type of society (e.g., geographical distance may create social distance in a traditional society but is less important in the postmodern – networked, Internet – society); (2) the content/issue; and (3) the aspects of social influence (spreading of messages and spreading of ideas. The experience of sorting out the difference between geographical and social distance, as well as attempts to translate one into another and convert both into abstract mathematical ‘quantity’ has shown that interdisciplinary communication cannot be reduced to the familiarisation with terms used within particular disciplinary areas.

A (mis)understanding of such a seemingly well-known term as *distance* may be considered an example of a communication problem of the semantic nature. Communication problems of semantic nature are the ones people usually consider. They give less consideration to problems of a semiotic nature.

Communication problems of a semiotic nature emerge due to the fact that modellers are used to a multimodal scientific discourse and feel more comfortable with tables and figures than with ‘plain’ text. Meanwhile, qualitative social research is presented mainly in a linguistic mode that modellers may find difficult to perceive and tend to associate with ‘narrative’ – with corresponding connotations and attitudes. The ‘true’ scientific discourse sees this genre as invalid, and pieces of the narrative can be perceived as ‘non-scientific’ (not rigorous) and “not to the point”. It is interesting that such an attitude may result in treating all that has the form of narrative equally - be it a piece of qualitative social research or a news report found on the WWW.

On the other hand, the communication problems of a semiotic nature may encourage the members of an interdisciplinary team to broaden their skills and knowledge. For example, I tried to use a spatial representation of statistical information on the settlement of religious groups. Since I needed the help of a modeller with relevant skills, I had to reformulate my research

questions and tasks accordingly. In the process, I found that the spatial representation of statistical information might be quite useful from the perspective of such a general problem as merging qualitative and quantitative social research on political violence, socio-economic conditions, and urban geography. Such a representation establishes concrete contexts for abstract statistical data, helps better understand people’s actions as influenced by the concrete (physical and cultural) conditions in which they exist, and may be used for understanding the dynamics of sociocultural changes.

Education and Collaboration

Education is an essential part of the interdisciplinary practice of social modelling because members of a team need to be familiar with the various subject fields that they bring to the team. Self-education and learning from others happens ‘naturally’, in the process of the researcher’s work with literature, or even casual conversations. However, it was found useful to have a certain organisational form that enables the team members to meet *regularly* (e.g., fortnightly meetings) in order to discuss a paper, a book chapter, or a media article on a certain issue.

In terms of ‘educational content’, it does not seem productive to provide a systematic outline of the foundations of social disciplines in order to familiarise the participants with a variety of theories and methodologies. Education in the interdisciplinary team is not about ‘reading textbooks’. Reading textbooks in social sciences can be productive if further reading supports it, preferably for a well-defined research purpose. It seems to be more useful, therefore, that any participant can suggest the materials for reading and discussion. In this case, they may vary from fundamental studies on a certain issue to casually encountered books and papers that someone finds interesting, useful, or provocative. In order to make such fragmented reading an *educational* activity, the following may be recommended. First, it is highly desirable that every piece of concrete research on a particular issue is linked to the general issues in the social research. The discussion, therefore, needs to be guided by a social scientist who is able to reconstruct the ‘dialogue’ in which a given text is embedded. Second, the participants should aim at approaching this text from their own perspective and try to understand how it can inform their work on a specific research problem. Third, it is useful to make connections with previously read materials as well as with the participants’ papers, workshops or casual discussions.

This kind of educational practice can facilitate the interdisciplinary communication and create a foundation for the collaboration of modellers and social scientists. At the level of human interaction, interdisciplinary collaboration (reading and reviewing each others’ papers, mutual research and writing; attending workshops and participating in the discussion of presentations) is a big

challenge and requires considerable efforts. It is necessary, therefore, that the members of an interdisciplinary team find these efforts worthwhile and, indeed, necessary. The shared conceptual background created in the process of educational sessions can contribute to the team's willingness to cooperate. Another outcome of the educational activity is that it contributes to the 'team awareness' and promotes a collaboration-oriented culture of sharing information within the team. At least some portion of materials distributed within the team is accompanied by an explanation why these materials may be worth reading.

Interaction With The Object

Social modelling is 'secondary' research. Modellers deal with representations constructed within other disciplinary fields and discursive practices. The area of information sources used by modellers comprises such diverse and heterogeneous fields as academic studies, media, adversary propaganda, etc. The use of information sources in modelling needs to be informed by an understanding of the following: (a) those sources are not usually intended to be used for the purpose of modelling; they are shaped by other practices, needs, and interests (e.g., news stories in the media aim to promote certain views and ideas, rather than provide objective facts); (b) they are shaped by different discourses, knowledge systems, and cultural worldviews; and (c) access to information sources is mediated by information technologies and resources (databases, search engines, etc), which are both selected and selective.

It is suggested that the assessment of the reliability and usefulness of information sources needs to be supported by an analysis of the conditions of their production, distribution, and consumption. This approach has an important practical implication for the organization of interdisciplinary research. According to this approach, exchange of information within the team and development of team awareness requires that documents passed on to others need to be accompanied by the qualitative description of the information source. The presentation suggested a framework for the qualitative meta-description of different sources and outlines specific sets of assessment criteria relevant for different fields – research, media, and propaganda.

Interaction With The Context: User and Society (Utility of Models)

Social scientific knowledge is not neutral. Integration of social scientific knowledge into modelling results in the proliferation of certain versions of reality and silencing others, which may affect upon the practices supported by the models and modelling tools and may have broader sociocultural implications. Elsewhere (Resnyansky 2006; Bennett and Resnyansky 2006), a critical reflexive

approach to an assessment of technologies and models and modelling tools has been proposed. This paper outlines the suggested approach focusing upon the concepts of terrorism and ethnicity.

Conclusion

This paper suggests to approach social modelling as an interdisciplinary research practice and explores the heuristic significance of the concept of interaction for the integration of social sciences and modelling. This paper also tries to map the interdisciplinary research aiming at the modelling of social processes and phenomena. The concepts of practice and interaction have been used in order to identify the issues related to social modelling as an interdisciplinary research practice. The following aspects have been identified and examined:

(1) Interaction at the conceptual level - between fields of knowledge.

Social science and computational science are characterized by different theoretical/conceptual models of the object of research and different methodologies. This interaction, therefore, requires epistemological reflection and a search for intermediate theories and conceptual links. Successful interaction between the two fields of knowledge is possible if it is a 'two-way road' – in other words, it is not just the modelling community that formulates demands but the social science as well. Actually, it may be useful to reverse the order. In this paper, the perspective of a social scientist involved in qualitative research is adopted in order to understand why modelling may be useful for social research on political violence, mass violence, and cultural changes.

(2) Interaction between the members of the interdisciplinary research team – social scientists, computational scientists.

This interaction involves communication, learning, and collaboration. It is a mundane practice of social interaction with such psychological issues involved as power, hierarchy and interests. It is a discursive practice that is located within a particular institutional setting with its traditions, values, and ethos; it is discursive practice which makes it even more unique because people draw upon their unique experiences and backgrounds in order to understand each other and express themselves. It is a communicative activity which means that it needs to be facilitated by somebody and requires means and organization. And, finally, it is a collaborative research activity that is realized in concrete forms, such as discussions of books on social theory or the placement of documents on a group website.

(3) Interaction with the 'context'.

The 'context' is represented, on the one hand, by the 'client/user' (e.g., a security agency, an intelligence analyst, a decision maker, a government, a city council) and, on the other hand, the society. This kind of interaction

requires knowledge of security agencies and decision makers' needs – and their critical reflection because the needs as they are formulated from within a practice cannot be taken for granted and need to be theorized (re-stated as a research problem) in order to guide the development of models. On the other hand, the modelers need to be aware of the models and the modelling tools' effects upon specific practices and a broader society, and should be able to critically reflect upon such effects.

(4) '*Interaction*' with the object of research (the modeled 'reality').

Social modelers interact with other research communities as well as non-research groups that also provide versions of reality (data, etc) that modelers can use. It is essential that modelling is a 'secondary' research as it usually draws upon other disciplines, which requires critical reflection upon representations of reality constructed within different discursive practices.

Analysis of these dimensions of interdisciplinary research practice can usefully inform the integration of social scientific knowledge into modelling. The adoption of the concept of practice enables us to identify concrete problems related to the work of a specific interdisciplinary research team. Also, an understanding of social modelling as a social practice - contextualized, interactive and transformative – allows such concepts as agency, critical reflection, and responsibility to be introduced in social modelling.

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