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The Concept of Small Group in Facilities Programming Research

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Abstract This paper presents methodological foundations for developing models of the small group in regard to Facilities Programming research. A "picture" of the social reality is proposed. Its purpose is to make visible, to illustrate, and to explain by means of a simple scheme the essence and the rationale of the co-existence and interaction of people; their congregation in groups and their co-operation in achieving common goals by providing mutual support, complementary efforts, and resources. Then, some aspects of the small group are described. These are chosen because of their relevance to the spatial structures of activity and pertinence to building design decisions. Several issues relevant to the sociospatial interactions are selected and presented in brief. In regard to sociospatial interactions, we will consider only those aspects of the small group that are related to the organization of space and the features that are affected or influenced by the spatial factors. This principle sets up the vantage point for examining of existing models of the small group in the social science. Following its development, a pragmatically built, design-related concept is proposed. At the end of the paper, several examples that illustrate the application of small group concepts in architectural programming and design are presented.

Keywords Small Group, Facilities Programming, Environmental Sociology

1. Introduction

The basic function of the theoretical models in applied research (e.g., Facilities Programming) is to delineate the aspect, the type, and the volume of the information that is to be gathered, and after that, to guide the process of its processing, systematization and interpretation. The choice of a theoretical model is crucial for the relevant orientation of the research effort and decision making about the aspects that should be abstracted for study, or overlooked, and even ignored. Such choice directly influences the mental "picture" of the object of study. There are several kinds of conceptual models that are used in facilities programming research [1]: user characteristics; behavior circuits; and behavior settings. We should also mention the "activity" model [2], "people-activities-relationships" model [3], and person/purpose/behavior [4] approach. The models of the user characteristics and behavior/activity are helpful guides for collecting design-relevant information, but they lack a strong unifying principle that can make them an instrument for conceptual structuring of an extremely heterogeneous and complex research "object," such as the human/social component of socio-spatial systems. These types of models cannot provide a vantage point that will make possible the analysis of the organization of individuals in the process of their activities, which is the essence of social reality and all forms of social co-existence. Without such an organizing principle, programming research becomes fragmented, loses logical consistency, and becomes one-sided or mosaic. Although an "activity" or a "user" research approach is useful in collecting important information about the social "fragment" that is sheltered by the building under design, this would not be enough for "constructing" a holistic, complete, and integrated mental picture of the social subsystem of the sociospatial system, its elements, and the conflicts between them. Such a comprehensive look is an essential requirement in information services for design. In this regard, the schemes proposed by Pena [3] and Wade [4] are most inclusive.

Buildings and premises are inhabited not by isolated individuals, but rather by mutually co-existing people, who work together, rest together, cooperate or conflict with each other. This requires that the spatial structure should provide all necessary conditions for teamwork and cooperation, communication, and group leisure activity. The provision for just individual needs will not enhance enough the habitability of built environment. The concentration of people and groups in a closed space, such as the premises, leads to a myriad of conflicts. They arise both in the course

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of simultaneous activity and in connection with the common use and the appropriation of space that lead to emerging sociospatial relations. From that perspective, the requirements of the human individual become a part of the conditions that the building has to supply for the efficient course of the social activities and processes. The needs of the individual activity participant and building user develop at the anthropometric, physiological and psychological levels. However, the purpose of the building environment is to create the necessary conditions for informal or formal organized social activities that are performed simultaneously by a number of participants. Several new requirements stem from that point. The theoretical models for programming research should respond to these assumptions. They should be "all-inclusive," taking into account the heterogeneous and complex nature of social entities. This forms the basis for the goal of the present paper. It will be concerned with the exploration of the heuristic opportunities that a model of a "social entity" would provide. Specifically, it will explore the model of the small group, and propose that it be adopted in programming research. A design-relevant view-point toward the small group will be described, but the detailed presentation of the model will not be considered. This is a task for a later stage of development.

From a methodological point of view, this paper is structured in two parts: First, a theoretical foundation is proposed, which consists mainly of basic assumptions for compiling models of the small group in regard to Facilities Programming research. At the beginning, a "picture" of the social reality is proposed, and its purpose is to make visible, to illustrate, and to explain by means of a simple and metaphoric scheme the essence and the rationale of the co-existence and interaction of people: their congregating in groups and their cooperation to achieve common goals by providing mutual support, complementary efforts, and resources. Next, aspects of the small group are described. These were chosen because of both their interdependence with the spatial structures of activity and pertinence for building design decisions. Several issues relevant to the sociospatial interactions have been chosen and are presented in brief. These include basic axioms of small group research. The purpose of their presentation is not making contributions in that field, but rather examining their relevancy to design problem solutions. From such a point of view, the research effort results in the choice and substantiation, rather than in new fundamental knowledge. The sense of such results is in the articulation of the arguments and the instrumental efficiency. In regard to sociospatial interactions, we will consider only those aspects of the small group that are related to the spatial structure and preferences, or as stated from the opposite point of view, those features of the group that are affected or influenced by the spatial factors. The principle of "sociospatial relating" sets up the vantage point for examining the existing models of the small group in the social sciences. At the end, a new, pragmatically built concept that is design-related will be proposed. In the second part of the paper several examples that illustrate the application of small group concepts in architectural programming and design are presented. There is an emphasis on the practical application of the theoretical concepts and their relevancy to different types of design situations.

2. Concepts of Small Group

The subject of small groups is deeply studied in several fundamental social science disciplines (sociology, social psychology, anthropology), in management science, in education research, in counseling and therapy, etc. A comparative analysis of the literature shows the predominant emphasis and issues in each of these fields. Sociologists are involved with research on interests, roles, norms, and status. Social psychologists are most pervasive and work on a broad range of issues. Anthropologists have a holistic outlook and an explicit emphasis on culture and identity. In the applied sciences, if judged by fundamental scientific standards, the interest is pragmatic, often eclectic and mosaic. Managers are interested in leadership, decision-making and creativity, group dynamics, conflict, power, politics, organizational socialization, communication, etc., or stated in brief: in group processes [5]. Education scientists research a broad spectrum of group processes, from socialization and learning, to leadership and group management. Counselors and therapists use the group as a therapeutic setting for social malfunctioning behavior and interpersonal communication disorders that are the cause of severe personality problems. In each of these fields preferences are displayed toward theoretical orientations and specific models that provide the most powerful, relevant, and heuristic explanations. They have their own vantage points, concepts, and terms that sometimes make them look one-sided or deficient if viewed by professionals in other fields.

Theodore Mills [6] identifies several conceptual orientations for studying and analyzing small groups. They are the Quasi-Mechanical orientation [7], the Organismic orientations [8], the Conflict orientation [9], the Equilibrium orientation [10], the Structural-functional orientation [11], and the cybernetic-growth orientation.

Other authors identify a number of different theoretical approaches, which often overlap. That does not lessen their originality and scientific distinctions, however. Shaw [12], in his work on group dynamics, classifies several theories: Group Syntality [13], Group Achievement [14], Exchange [15], and Fundamental Interpersonal Relations Orientations [16, 17]. Clovis Shepherd [18] presents a slightly different classification, featuring the developments in sociology. He outlines the Field theory of Kurt Lewin [19, 20], the Interaction Process Analysis (IPA) of Robert Bales [21], and Homans' System Theory [22]. He also mentions several middle range theories, among them those of Festinger [23, 24], Kelman [25], Peter Blau [26], Beunis and Shepard [27]. Shaw also considers a classification of theoretical endeavor, or rather, theoretical models based on some basic aspects of the small group: a Perceptual model of the group, a Motivation model, a Goal model, an Organization model, an

Interdependency, and an Interaction model of the group.

While small group research seems to have gained popularity in fields such as organizations, gender, education, leadership studies, and culture, paradoxically it has lost ground in sociology and sociological social psychology in recent decades. As Harrington and Fine [28] point out, unlike in the heyday of this the 1950s and 1960s when small groups were viewed as social entities in their own right, currently small group research has been fragmented among a variety of subfields, and small groups are used primarily as a "black box" that is a mediating form linking individual action and social structure. These authors further appeal for a renewed prominence of small group studies by integrating them in 21st century sociology. They make a cogent argument that the way to open the "black box" is to emphasize findings in small group processes and identify five such promising developments: 1) groups and social control; 2) groups as agents of social change; 3) groups and network organization; 4) groups and social representations; and 5) groups and status allocation.

Recent developments have highlighted a number of issues impeding the progress in small group theory and research, notably the tendency to fragment across disciplines and being bound to a specific discipline [29]. In order to overcome these deficiencies, a modular approach to integrating small group theory has been proposed and illustrated with the integration of resistance theory and reward expectations theory [30].

This brief overview was made with the sole purpose of showing the variety of approaches to small group studies and to emphasize the complexity and multifaceted nature of the object. Most of the theories have been created with special social research aims in mind, and they are particularly effective in social design (management, organizational development, education, therapy, social work, etc.). But neither of them is intended for Facilities Programming research guidance. This should not be considered a shortcoming of the theories or deficiency of the corresponding social disciplines. Rather, it is simply a consequence of a natural development in the field that is not influenced by any "commission" by the architectural design community. With the advent of Environment and Behavior Studies, particular attention has been paid to the interpersonal processes in the Built environment (privacy, personal space, crowding, territoriality; spatial behavior, sitting arrangements, proximity, distance, etc.). In all these cases, it is the social interaction in the environmental context that is studied, and not the group as an entity. Social psychologists apparently were the first among social scientists to pay attention to the physical environment of groups [12]. But their interest was provoked solely by the consideration for one more factor (the physical surroundings) on group processes. They never intended to move beyond that subject. Such is the situation in psychological studies of work and management [31, 32]. Although there are evidently a lot of researchers in that field, no one has reported an interest in the subject from a design programming point of view. Usually, it is the formation, the development, and the dynamics of the group that constitute the basic concern, and environment is just one of the factors studied [5, 12, 33].

Environmental psychologists concentrate much more on sociospatial phenomena such as privacy, territory, crowding, personal space and interaction, which are the major issues in that field. All such studies have one important characteristic in common: they focus on factors that influence interaction, but they do not attempt to investigate the activity organization and its relationships with the built environment. Instead, the group is viewed in terms of social interaction and group dynamics, and not as an activity system. The approaches applied may be relevant for interior design research, but they prove to be one-sided in regard to environmental design. It is one thing to study the group as a prime object, and it is quite another to study the environment-behavior relations, applying the small group concept. This gives grounds to abstain from attempts to use the current advances in the field for developing a conceptual framework in a deductive way.

In the domain of sociology of built environment, W. Michelson [34] shows strong interest in roles and statues, informal/formal and primary/secondary group dimensions. Michelson's Environment and Behavior approach is based on group-life phenomena and models and shows high efficiency in revealing the nature of sociospatial interaction. He suggests (p. 166) that knowledge about social relationships (the subject of sociology, [34]), or in other words, social groupings, may provide positive directions for research.

Irvin Altman [35] is much more explicit in his proposal for extensive use of the concept of the social group in design research. He argues that most of the popular approaches (needs, activities, and user characteristics) lack a unifying focus and do not take into account a fundamental quality of the social reality: its organized, unified, and holistic nature. He proposes that social entities should be examined in design research and introduces the term "social unit." This can be any social "whole," acting in a defined setting, for example: a person, a group, an organization, etc. There is a major difference between his proposition (although he did not develop it further) and Michelson's proposition, which is concerned not with the wholeness and the organization of social reality, but with the uniformity of the group member characteristics. Michelson makes use mainly of this quality of the group. He views the group not as entity, but as homogeneity. This approach applied to architecture programming is classified by Sims [1] as one of "user characteristics." It is very effective in design situations with specific populations and relatively recurrent building types. On the other hand, Altman's proposal, if developed in detail, may lead to a new, comprehensive programming approach. Its most serious asset is that the holistic nature of any "social unit" offers to Architectural Programming research an organizing focus for the efforts of professionals from different disciplines, fields, and subject areas, all concerned with sociospatial interactions.

The concept of the social unit provides the methodological

rationale of this paper, posing the problem of identifying space- relevant social units, and furthermore, "constructing" appropriate view-points and instrumental propositions.

3. Conceptualizing the Small Group for the Needs of Design Research

The multitude of conceptual orientations and models is just an argument for the problem-specific theoretical activities in the field of small group research. This gives grounds for exploring new possibilities and attempting to build a model that will take into account the most pertinent design considerations. Such intention does not assume that the current models should be discarded and the goal will be to seek a completely new solution. Instead, the rich theoretical heritage will be used as intensively as possible, by borrowing viewpoints, conceptual orientations, or substantive elements.

In order to correctly state the margin and the directions for solving problems, some basic social philosophy principles and metaphors will be used. First, a "metaphorical" description of the social reality is proposed, with the intention both for presenting a rationale for the vantage-point that is used and for "tuning" the mind to that particular way of thinking.

The social world can be "desegregated" into distinct situations. Each one consists of a number of participants. Their interactions with the built environment are mediated by the interactions among themselves. These interactions could happen among participants in a collective activity with similar goals and complementary technologically-functionally interconnected roles, but they may also merge among participants with different or opposing interests and goals. Here, "collective activity" is defined as the technologically necessary actions in a specified sequence that aim at achieving a goal; and also, spatially bound, but technologically distinct activity chains, or participants with antagonistic or quasi-antagonistic goals and motives for participating in one and the same activity. In the last case, activity is defined as a broad scope of actions, amalgamated by some quite general function, so that in this framework, antagonistic interests can develop. Participation in a collective activity may be due to similar goals and interests, and the corresponding roles that set the ground for emerging of groups and functional aggregates. Or, in the case of communication, exchange, and service, the participants may have different interests, but they act in a complementary way in order to achieve their goals. These interactions and the social relations stemming from them are organized in a specific way, which includes the organization of participation. This should be viewed as a way of co-existence of individuals, the form of exercising synergetic acts. The participation in collective activities leads to a congregation of a number of people whose interactions have to be regulated in such a way so that the efficiency can rise high and conflicts should decrease.

From this vantage point the small group is viewed, firstly, as a form of organization of joint activities. Only after that, is it seen as a structure that mediates the participation of the individual in larger groups and the social life in general. The small group is defined as an organized system of two or more individuals but not more than 40 who are interrelated so that the system performs some activity, has a standard set of role relationships among its members, and has a set of norms that regulate the activities of the group and each of its members [19]. From the point of view of an "activity," the small group is a system of interacting participants, organized in order to perform some kind of action. It is the activity that makes the grounds for the emergence of the rationale, sense, meaning and purpose of the interactions. The small group is also defined by face-to-face communication, the emotional links and the importance of the individual characteristics of the partners. All these presuppose several different structures of the group: the "technological" structure, the role structure, the interpersonal structure, etc.

This multifaceted nature of the group leads to a multitude of conceptual orientations and descriptions. Two of the most appropriate for design research will be presented here. One point of view puts an emphasis on the purposeful activity. Thus, the group is described as a team, task force, goal-directed functional unit. It includes a system of roles or co-operative positions. If they are institutionalized and specified in codes, the group is "formal." Such a group has a formal and an informal structure. Every participant enters these structures simultaneously and functions both as a role-performer and as an individual/personality. For the normal co-existence of these structures, their demarcation is necessary. This perspective emphasizes the "technological" aspect of activity and leads to an "organizational reductionism": the small group is equated with the organization, a kind of "mini-organization," or at least its functional component. Anyway, it keeps a strong "activity" stance and promotes a social relationship vision.

The second orientation takes into account the interaction processes among the participants, viewed as personalities. This could be interpreted in two ways: Firstly, the group is viewed as a multitude of individuals who interact with each other and display social-psychological patterns. Secondly, the group is described as an organization of face-to-face interactions. In the first case, the group is reduced to free individuals and the conditions necessary for its existence are substituted with the social-psychological needs of the personality. This is an anthropocentric way of thinking that reduces the group to the study of the individual. In the second case, the group is described as a social-psychological entity that possesses its own identity that cannot be reduced to the study of the organization or the individual. This makes the distinctive feature of the small group, the characteristic that demarcates it most from the other types of social entities. In this case the individual acts not as a social element, but as a personality. The essence of the interactions is supposed to stem from human nature, instead of from objective social relationships, and the social aspect exists only through the

personality.

This brief and selective review of small group concepts was necessary for tracing ways of eventual reductionism. The multistructural and heterogeneous character of the small group is made explicit in order to make grounds for abstracting some elements of the whole.

The substantive description of the group and the dynamics of its constituent and supporting processes will not be considered in this paper. Instead, the objective was just to evoke awareness, to promote the concept, and to present and substantiate viewpoints that are relevant to programming research. Viewed as an activity system, the small group allows a conceptualization that leads to a design-relevant systematic description of social reality, particularly small-scale social situations, their built environment needs, and the priorities in planning and design. Further, this activity approach may be executed in the framework of organization analysis, social-psychological interpretations, or some personality paradigms. This depends on the researcher's attitudes and inclinations, his/her disposition towards reductionism, transformations, or substitutions.

4. Settings for Application

The shared system of goals of the group, the common organization, and the leadership integrate the molar (macro) actions of the individuals [5]. The emerging social and interpersonal relations in the process of activity are consolidated and regulated by homeostatic mechanisms. The concept of the group as an “action entity" provides a framework for collecting, organizing, analyzing, and interpreting information about molar acts, meanings, and needs, as well as considering the complex interpersonal and social processes that have to be provided with necessary conditions. Thus, the model of the small group may become a basis for a conceptual framework for research on small and medium size sociospatial systems, as well as situations demanding strong support of the face-to-face communication and interpersonal informal structures.

For example, the model of the household and the nuclear families that constitute it (a basic social institution and a particular small group), makes the information basis for design research on residences, country houses (villas), resort boarding houses, etc. The number of members, the subgroups, the relations among them, the behavior patterns, the household composition, and the financial resources greatly influence the size, structure, and symbolism of the living space. Households from different social strata show specific ways of structuring the space in regard to unifying and separating the premises and particularly, the degree of separation and seclusion of the areas (zones) of the household subgroups. Different social strata or ethnic patterns of use of space may range from a total integration of the areas/spaces up to their separation and seclusion in two self-contained dwellings. These can be situated next to one another, built on a party-wall principle; or they may be in the same block; and even, in another neighborhood.

The model of the small group also offers a unifying framework in environments for children’s research: day-care centers, primary schools, theme parks, etc. The processes of socialization (assimilating the value system, behavior patterns and codes; acquiring social skills; developing a sense of belonging to a social group, the "we"-feeling, etc.) take place most effectively in a group environment that stimulates social interactions and role playing. In such cases the organization of space influences greatly the intensity and positive outcomes of the interactions and the learning of skills and behavior patterns. In this regard, the spatial structure of common spaces is very important. The socializing functions of the small group can be supported by careful selection of adjacencies and relationships among premises, the connections among them, and the gradation of spaces for private, individual, group, and intergroup (common) activities. In this regard the principle of the "lab system" in primary and elementary schools should be reconsidered. In this case, the pupils move every academic hour to new premises, thus losing the sense of place and belonging. The gains that come from more efficient use of equipment and the increased quality of instruction should be compared with the effects on the socialization process of the children and the acquisition of social skills and habits.

With the exception of the household/family and some specific residential spaces, the small group most often has a secondary nature. Furthermore, in many cases, it has no self-contained existence of its own, but instead is "situated" within the framework of a larger group or organization. Usually it "inhabits" only part of the space allocated to the organization, and in terms of premises this may only be an area in a room, a room, or rarely, several rooms. In many cases of sociospatial organization of group existence, the basic territorial unit is the "area," the "zone." It is separated or demarcated from the rest of the space in the premises by boundaries using different degrees of physical barriers, often semitransparent or mobile privacy screens that "fence" the area and mark zones and territories that are intended to be used only by specified categories of people. This way of using space is utilized in the open office planning strategy (bürolandschaft), where the workstations and the functional units’ territories all fit in a large space, often occupying a whole floor. In that hall-like "container," spaces are demarcated by means of furniture, semi-fixed features, changes in the floor height or cover, changes in the height of the ceiling, lighting, vegetation, utility pipes, etc. According to the Human Factor conceptual orientation in Management, the partitioning of the whole space into separate areas and zones that correspond to the functional units in the organization, increases group cohesion, "we" - feelings, professional morale, and hence efficiency.

A good example for the effectiveness of the "group concept" in sociospatial research is the well-known "Hawthorne experiment" of Elton Mayo [37]. The initial intention was to identify the influence of ambient environment on work efficiency. This theoretical model postulates direct man-environment interactions. In the course

of the study, the authors spotted some unexpected facts and tried to find reasons for them. It turned out that one of the factors is the group effect. In order to perform an experiment, the researchers had to take several workers at random from the big manufacturing halls and to accommodate them in a smaller room, in which the parameters of ambient environment were controlled. This spatial seclusion was one of the factors that brought about the formation of a small group. The experiment took many months and thus the workers became much closer than was usual in the big assembly hall. People began to help each other, to share information about personal and family problems, etc. At the end of the experiment one of the unintended results was the understanding that environment influences in different ways and degrees individual action and group activity. As a consequence, the open space planning was revisited and reconsidered. This led to some changes, such as the adoption of group spaces, private space, territory markers, etc.

There are other examples where the reality of group activity is recognized without resorting to scientific research. For example, restaurant managers know that some people can just consume their meal hastily in the common area and go, while others prefer to eat and socialize in booths. The space is structured not just by hundreds of individual "eating acts," but by the way these acts are consolidated in meaningful activities, whose purpose and motives are often quite different than the tasks of the single acts. Such a holistic way of conceptualizing activity makes it possible to consider not only the needs of individual acts, but also the demand of real social situations. This is why restaurant space is organized as main dining area, dancing areas, separations, banquet rooms, etc. The application of the "small group approach" is even more important when instead of "activity study," a behavior model is used. Behavior approaches are much more prone to compartmentalization of the reality and loss of latent unifying factors.

5. Concluding Remarks

The intent of this paper was to promote the concept of "the small group as an activity system" in programming research. It has postulated that the best way to introduce a cognitive structure to the heterogeneous and complex realm of sociospatial design situations is to use the concept of social entities. Furthermore, from the rich inventory of models of such entities, only these that are created in an activity perspective are most efficient. In this way two major methodological requirements are met: the sustenance of the integrity of the situation as a unifying factor of the framework and the methodological utilization of the main interactional mechanism: human activity.

The developments in the fields of small group research, human behavior, and activity—both in sociology and social psychology—can be utilized to lead to considerable improvements in the architectural programming conceptual models. It is a subject matter for future explorations, how such models will be developed, what their content will be, and which substantive issues will need further research, both by scientists in the fundamental social sciences, researchers in Environment and Behavior, and professionals at the theoretical level of Facilities Programming Studies.

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