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978-0-521-31947-8 - Work Places: The Psychology of the Physical Environment in Offices and Factories

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Excerpt

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INTRODUCTION

This book addresses the question, What is known about certain psychological and social-psychological influences of the physical environment in offices and factories? The opening chapter describes the general approach that guides the remainder of the book. It presents a framework for analyzing environmental influences in offices and factories, defines key terms, and identifies central themes. The chapter ends with a summary of the plan of the book.

Framework for analysis

The framework of this book grows out of two premises. First, people and their physical environments exert mutual influence, and together form interdependent systems. Second, relationships between people and physical settings differ, depending on whether the unit of analysis is the individual, the interpersonal relationship, or the entire organization. These three units of analysis are interrelated in that individuals participate in interpersonal relationships and interpersonal relationships are elements of organizations. However, the units of analysis operate within the context of physical environments of different size and scale. In consequence, each unit of analysis involves different facets of the physical environment, different outcomes, and different underlying processes.

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Mutual influence of people and settings

The term *physical environment* as used in this book refers to buildings and their interiors. This includes the appearance and layout of buildings, the arrangement of rooms, furnishings, and equipment, as well as ambient conditions (lighting, sound, temperature, and air). Examples of the mutual influence of people and physical environments are easy to find. Consider the operator of an electronic word processor in a new office. Bright overhead lights create glaring reflections in the video screen, which constantly distract him. He is dissatisfied with his working conditions, and his output suffers. He tolerates the effects of these adverse conditions for only a few hours before complaining to the office manager. Meanwhile he fashions a cardboard hood, which he tapes around his video screen to block the light; it is ugly but effective. He tapes newspaper onto the window to block the sunlight. The building engineer soon removes some of the overhead lamps; the office manager orders a commercially produced glare shield for the worker's video screen (and all others in the office), replacing the jury-rigged cardboard one. Venetian blinds are installed on the windows to replace the newspaper. These changes in the physical environment help the worker (and his peers) to feel more comfortable and satisfied in the new office. He is able to produce more work.

The example illustrates some of the influences that physical settings can have on occupants, and it illustrates Rene Dubos's (1980) observation that people never submit passively to environmental forces. This suggests a picture of the relationship between people and their settings as one of give and take.

People and their environments may be regarded as interdependent elements of a system, as has become traditional in branches of psychology that deal with the physical environment (e.g., Altman, 1973; McCormick, 1976; Proshansky, Ittelson & Rivlin, 1976). The systems perspective implies, among other things, that repetitions of the cycle of mutual influence tend toward a mutual accommodation between people and settings, as the occupants try to bring their environment into congruence with their needs and activities. This process can occur through modification of the environment. It can also occur through changes in occupants or their activities, defined here as *adaptation*. (See Dubos, 1980, for a discussion of this concept.) In effect, much of this book concerns adaptation in offices and factories.

Orientation toward outcomes

Although our preferred model of relationships between people and environments rests on the concept of a system, most of the available

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research uses a different approach. Empirical studies have generally investigated the connections of specific environmental variables with important *outcomes*. These consist of psychological, social-psychological, and organizational criteria, such as individual satisfaction or interpersonal communication.

This book focuses on empirical research, and reflects the orientation of the research toward outcomes. The choice of outcomes to treat as part of the model hinges on the unit of analysis.

Units of analysis

Shifting the focus from the individual to the interpersonal relationship to the organization is like changing the lenses on a camera. A picture of the organization as a whole calls for the wide-angle lens, with a focus broad enough to encompass the entire membership and the technological infrastructure of the organization. For interpersonal relationships the picture is less inclusive, narrowing to a few people at a time. Focusing on the individual calls for a closeup view of just one person. Figure 1.1 illustrates the analogy between units of analysis and width of focus.

Definitions. The term *individual* means a person who works in an organization, analytically separate from his or her social context. Interpersonal relationship refers to any transient or lasting bond between individuals, either job related or friendly. An important type of interpersonal relationship manifests as *group* – that is, two or more people interacting in such a way as to influence one another (Shaw, 1981). The type of group of interest here is the small group, usually fewer than 20 to 30 people. An *organization* includes a collection of people working in concert toward a common goal, with each person having a specified role and position in the hierarchy of authority. (By this definition, the members of an organization comprise a group with a complex and differentiated social structure.) The term organization as used here also includes the buildings, machinery, equipment, materials, and information under the control of its members. This definition of an organization approximates a *sociotechnical system*, or a marriage of a social system with a technological one (see Katz & Kahn, 1978). The definition applies particularly to organizations that operate offices or factories, many of which are private businesses or manufacturing firms.

Outcomes. Understanding environmental influences on individuals, interpersonal relationships, and organizations calls for an identification of key outcomes and specification of dynamic processes that mediate their

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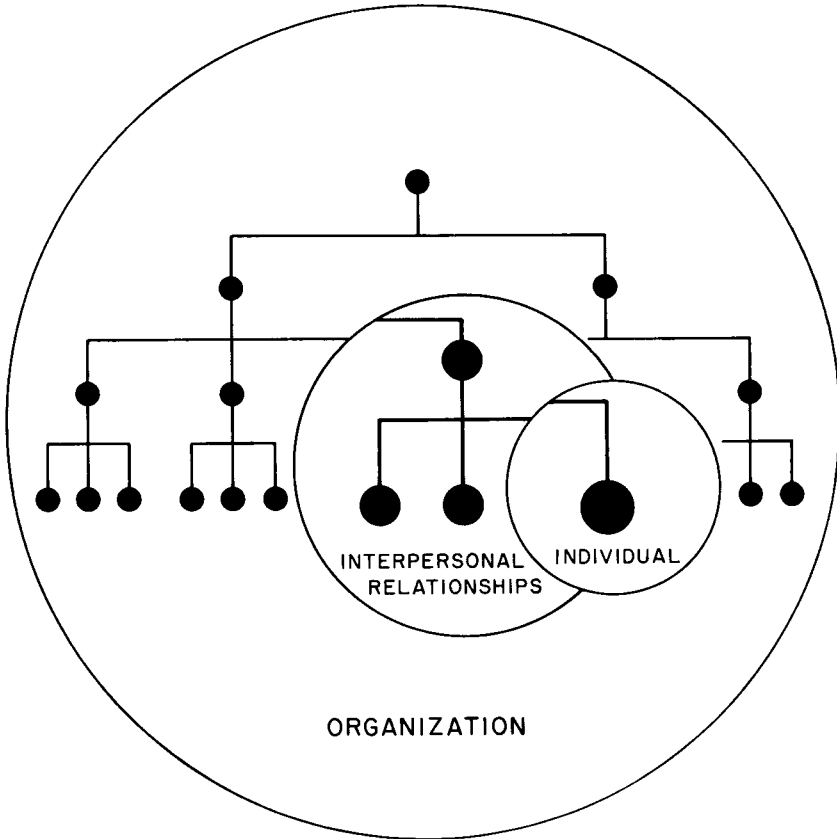


Figure 1.1. Three units of analysis: the individual worker, interpersonal relationships, and the organization.

influences. Table 1.1 shows the outcomes emphasized for each unit of analysis, and the general types of processes involved.

With the individual worker as the unit of analysis, psychologists have traditionally emphasized two outcomes: satisfaction and performance. The term *job satisfaction* refers to the worker's evaluation of his or her job as a whole or of the general quality of life at work (see Landy & Trumbo, 1976; Locke, 1983). Job satisfaction represents an amalgamation of many types of satisfaction, including satisfaction with the physical environment. The term *job performance* refers to the effectiveness with which the individual accomplishes assigned tasks, according to such criteria as quantity, quality, or efficiency. The physical environment can influence these outcomes through psychological processes. For example,

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Table 1.1. *Units of analysis, dynamic processes, and outcomes*

Units of analysis	Dynamic processes	Outcomes
Individual	Psychological	Satisfaction; performance
Interpersonal relationship	Social-psychological	Communication; group formation and cohesion
Organization	Organizational	Effectiveness

a factory worker in uncomfortably hot conditions may exercise psychological stress and consequently perform a complex task less effectively than at a comfortable temperature. At the same time, the worker probably feels dissatisfied with the working conditions, and perhaps with the job itself.

When analysis focuses on the interpersonal relationship, the picture becomes more complicated, because the outcomes relevant to the individual remain important, whereas others emerge in the interpersonal domain. For example, a manager receives a promotion and moves from a shared office to a private office. The office symbolizes her new status, enabling her to conduct confidential conversations regarding subordinates' work and personal concerns. Her satisfaction with the environment increases, as does her communication with other workers. Here the outcomes include satisfaction (an individual outcome) and communication (an interpersonal outcome). The underlying processes are interpersonal: information concerning her status conveyed through the workspace, and the conduct of personal conversations. (Communication is a process as well as an outcome, which illustrates the difficulty in specifying outcomes at the level of interpersonal relationships.)

Critical outcomes at the interpersonal level of analysis include the formation of groups and the development of group cohesion. For example, a dozen factory workers are placed in a segregated work-area, where they assemble automobile engines as a team. Their physical separation from other workers makes it inconvenient to seek social stimulation outside the work area, and close proximity during the performance of work creates opportunities for conversation. Their common work area also helps define them as a group. As they work and talk together, they eventually develop into a cohesive team. The existence of a cohesive team contributes to their job satisfaction, and to their efficiency as a work-unit. The process underlying group formation is face-to-face conversation, made convenient by the physical environment.

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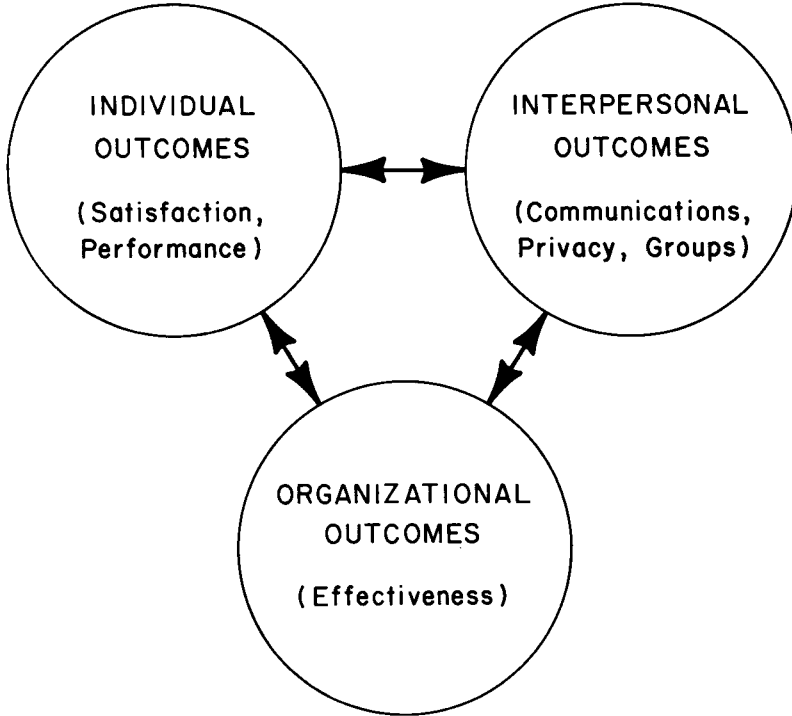


Figure 1.2. Interconnections among outcomes at three levels of analysis.

Focusing on the organization as the unit of analysis creates still greater complexity, because outcomes for the organization encompass interpersonal and individual outcomes, and the three types of outcomes are interdependent. As shown in Figure 1.2, outcomes at the three levels of analysis are all linked, in that an outcome at any level of analysis can influence outcomes for the other two. For example, an insurance company measures its success at least partly in terms of the volume of sales of insurance policies. This outcome at the level of the organization depends on the performance of salespersons (an individual outcome) and on the coordination of effort within sales teams, which depends in turn on communication (interpersonal outcome). Communication and individual performance may be mutually dependent in this situation in that effective communication contributes to performance, and good performance leads to a worker's being sought out for communication by peers.

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The key outcome for the largest unit of analysis is organizational effectiveness, which includes not only productivity, but other criteria of success as well. Organizational psychologists disagree about the definition of effectiveness (see, e.g., Katz & Kahn, 1978, chapter 8), although a few common themes can be discerned in the various definitions. For present purposes, the definition of organizational effectiveness refers to its success at maintaining satisfaction and commitment among its members, communication and coordination among its work-units, adequate production, and a mutually supportive relationship with its external environment. These outcomes depend on many factors, including the physical environment in the offices and factories of the organization.

Facets of the physical environment

A central proposition of our model is that the individual, interpersonal, and organizational levels of analysis emphasize different aspects of the physical environment. The difference concerns the relative size or scale of the environment for the three units of analysis.

At the smallest scale, the physical environment of the individual comprises his or her immediate surroundings during the workday, which consist primarily of a workspace or work-station and its ambient conditions. We define *work-station* as a place designated for an individual to work, such as a desk and chair in an office or a position at a production line in a factory. The term *workspace* is more restrictive; it refers here to a work-station assigned to a specific individual. Workspaces and work-stations include furniture, machinery, equipment, supplies, decorative items, and other things that occupy the area designated for the person who works there. *Ambient conditions* refer to the atmosphere of a working environment, both literally and figuratively. These conditions include the quality and movement of the air, the temperature, the humidity, the ambient sound, and the lighting (see Parsons, 1976). (The individual's environment also includes areas surrounding the work-station designed to support the work, such as locker rooms, restrooms, hallways, conference rooms, libraries, lounges, gymnasias, cafeterias, and parking garages.

The interpersonal level of analysis involves a larger-scale environment, including features of workspaces with symbolic value, the layout of rooms, and the layout of buildings. Symbolic qualities of workspaces concern the occupant's status or self-identity. The layout and arrangement of rooms in the layout of buildings influences the convenience of face-to-face conversations, through the physical proximity of workers and barriers that separate their workspaces.

In analyzing the organization as a whole, the scale of the physical

Table 1.2. *Levels of analysis, facets of the environment, processes, and outcomes*

Level of analysis	Facets of physical environment	Key processes	Outcomes
Individual workers	Ambient conditions	Adaptation	Satisfaction Performance
	Temperature	Arousal	
	Air quality	Overload	
	Lighting	Stress	
	Noise	Fatigue	
	Music	Attitudes	
	Work-stations		
	Color		
	Equipment		
	Chair		
Interpersonal relationships	Floorspace		Adequacy of communication Group formation Group cohesion
	Supporting environment		
	Hallways		
	Restrooms		
	Work areas, etc.		
	Workspaces	Self-identity	
	Differentiation	Status	
	Room layout	Regulation of immediacy	
	Seating arrangements	Self-presentation	
	Furniture	Choices in communication	
Organizations	Building layout	Regulation of interaction (privacy)	Organizational effectiveness
	Inter-workspace proximity		
	Enclosure of workspaces		
	Gathering places		
	Buildings		
	Separation of work-units	Congruence of organizational process and structure with the physical environment	
	Differentiation of work-units		

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environment is larger still, encompassing entire buildings. Details of the buildings and their design express the values of the organization and determine its flexibility. The layout of the work-areas in the buildings symbolically defines work-groups and establishes their accessibility.

Table 1.2 summarizes the facets of the physical environment emphasized for each unit of analysis. Also listed are the specific psychological and social-psychological processes that may mediate the influence of the environment on the outcomes.

Dynamic processes that mediate the influences of the environment at the individual level of analysis are psychological responses evoked under a variety of conditions. Perhaps the simplest is the individual's attitude concerning the environment, which includes an evaluative judgment as well as certain beliefs. Other responses include arousal, or the individual's degree of alertness or excitation, and psychological stress, a mobilization of a person's capacities to deal with adversity, challenge, threat, or demand. The environment can distract attention and create overload, which arises when an individual receives stimulation or information at a rate that exceeds his or her capacities. The environment can also create discomfort or fatigue. However, all these psychological responses can change with continued experience in an environment, particularly through perceptual adaptation (extreme environmental conditions such as loud noise appear less extreme as time passes).

Dynamic processes at the interpersonal level concern interactions between people. Symbolic properties of the individual workspace involve the display of the individual's personal identity or status in the organization. When people converse, the environment is involved through the regulation of immediacy, the psychological closeness or distance between individuals. Through the convenience of face-to-face conversation between people, the environment may influence a person's choices regarding communication, including the medium or the person with whom to communicate. Through its influence on the accessibility of people to one another, the environment enters the process of regulation of social interaction. The convenience of conversation may also provide opportunities for the formation of new groups and the development of cohesion in existing groups.

At the level of the organization, dynamic processes concern the operation of the system as a whole. The principal relevance of the physical environment occurs through its support of the organization's structure, within which its activities proceed. (The term organizational structure refers here to enduring relationships among work-roles, and their relationships with the organization's technology.) In particular, the organization's definition of values, roles, and work-units can involve the physical environment. Our premise is that organizations strive for con-

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gruence between their structure and the physical environment of their offices and factories.

In summary, the framework underlying this book proposes that people and their physical environments exert mutual influence, and represent interdependent elements of systems. Key results of the mutual influence are labeled as outcomes. The framework defines three interrelated units of analysis – individuals, interpersonal relationships, and organizations – and emphasizes different outcomes for each. Specific facets of the physical environment are identified for each unit of analysis as sources of influence on the outcomes. Processes that mediate the influences of the environment are psychological, social-psychological, and organizational.

Themes

Our exploration of the psychology of the physical environment in offices and factories incorporates two central themes. The first is evolution, or the idea that offices and factories can best be understood within the context of their development. The second theme is differential impact, the idea that an environment affects people in different ways.

Evolution

A central premise of our approach holds that offices and factories represent the products of constantly evolving technology, but that they continue to accommodate the needs of the occupants. Although the work environments have changed, they raise a collection of recurrent issues: comfort and efficiency for the individual; accessibility and symbolic meanings for interpersonal relationships; and congruence with the structure of the organization.

Differential impact

A second premise is that a given feature of the work environment influences its occupants in different ways, depending on characteristics of the person, the job, the group, and the organization. For instance, lighting adequate for performance of an office task by an individual of age 30 may be far too dim for someone age 60 doing the same task. Responses to the ambient conditions are particularly variable, but essentially all aspects of the work environment seem to have differential impact.