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"Environment/Behavior Basics", *In Sync: Environmental Behavior Research and the Design of Learning Spaces*

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Chapter Two of this book is included in this handout. For more information about this publication, please visit SCUP's website at:
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The Impact of Technologies on Learning

A study at the University of Washington called "Listening to the Learner," asked students about their desire for using technology in coursework, and facult about current approaches/barriers. Curricula were developed that intergrate education technology in a learner-centered way.

by Kimberly Gustafson

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Today's college students expect to use and to learn cutting-edge technology during their academic careers. Nearly 20 percent of all college students began using a computer between the ages of 5 and 8, and all current students participating in the national Pew Internet Project had begun using the computer by the time they were 16–18 years old (Jones 2002). In addition, 79 percent of students agreed or strongly agreed that Internet use has had a positive impact on their education (Jones 2002). When the University of Washington's Office of Educational Assessment administered a survey asking students to rate the importance of 17 abilities, the ability to work with technology was ranked among the top 5 (Macklin 2001).

These high expectations indicate that college students believe learning technologies are integral to their course work. However, many schools and teachers have not yet recognized—much less responded to—the new ways that students communicate, access information, and value technology (Levin and Arafeh 2002).

According to the National Research Council's *How People Learn: Brain, Mind, Experience, and School,* effective student learning can occur only when instructors fully engage their students' skills, interests, and abilities and incorporate that awareness into their teaching practices (Bransford, Brown, and Cocking 1999). Therefore, to enhance student learning, the discrepancy between the expectations of students and actual teacher integration of

technology into the classroom must be resolved. This requires a shift from a teacher-centered model, in which instructors exclusively transmit knowledge, to a learner-centered model. A learner-centered approach begins with what learners bring to the setting—their cultural practices and beliefs as well as knowledge of academic content—and the use of this information to construct new knowledge (Bransford, Brown, and Cocking 1999).

Developing a learning-centered learning environment is a challenge. Teachers do not always share the life experiences of their students and research that focuses on student life experiences is relatively recent and scarce (Nieto 1994). As a result, many faculty have difficulty incorporating the knowledge and technical abilities that students already have with the requirements of the curriculum (Bransford, Brown, and Cocking 1999).

In response to this challenge, the Program for Educational Transformation Through Technology (PETTT), a research group at the University of Washington, conducted a study called Listening to the Learner. This study explored student desires to use technology in their course work, faculty integration of technology-based educational approaches, and barriers to technology adoption. The findings were then synthesized to plan curricula that integrate educational technology.

The purpose of this exploration was to develop recommendations designed to assist in curriculum planning that will integrate educational technology, but it also was to align support and services for technology adoption to meet the needs of teachers and learners and to inform the design and development of technologies used in higher education.

Study Methods

Through focus groups, approximately 100 students and faculty participated in this qualitative multidisciplinary study. To allow the ultimate consumers of our educational effort to guide this study, Listening to the Learner adopted a value-sensitive design by enrolling three students in a two-quarter undergraduate research course. By the completion of this course, students had learned the basics of research design, articulated research questions, developed content for focus groups, and led the student discussions.

Members of PETTT's research team conducted focus groups with both faculty and student groups. The content of these discussions was developed from two sources. First, the research team investigated in greater depth the findings from the faculty survey on educational technology administered in 2001 on the University of Washington campus. This survey aimed to gain an understanding of how faculty are actually using educational technologies in the classroom and provided dynamic data to explore further in focus groups. Second, the research team asked the same questions in the student focus groups and in the faculty focus groups.

By conducting student and faculty focus groups, PETTT considered the needs of the university community as a whole. This resulted in a more comprehensive understanding of the perceptions and expectations of educational technology on campus.

Analysis of the data included the identification of emergent themes and patterns in the focus groups, which provided a systematic and objective means to make valid inferences from verbal, visual, or written data.

The research design has limitations. There were a small number of self-selected focus group participants. Therefore, the participants may not have been a representative sample of the entire undergraduate and faculty population at the university. Furthermore, those students who did not select to participate in this study may not be inclined to learn with educational technology. These limitations may have resulted in skewed data toward planning curricula that meets the preferred learning methods of those students who are "tech-savvy."

Students' Expectations of Technologies in Course Work

Throughout the focus groups, students noted that they expect a university education to include the use and instruction of important technologies in academic and nonacademic settings. Additionally, students expressed concerns that the present level of technology integration does not reflect this expectation. When students were asked to articulate what specific technologies they would like to have integrated into their educational experience, the following tools were discussed.

Course Web sites. Students defined course Web sites as extremely useful tools in their academic careers. Many students wanted to have Web sites mandatory for all courses at the university because they not only provide a central location to easily access information but also are successful in strengthening and clarifying content presented in lectures. Those professors who provided a course Web

site were viewed as having a more active interest in student learning.

In addition, students identified the basic components that should be included in the mandatory course Web sites. The desired components included anonymous feedback, homework solutions, grades/grading criteria, discussion boards, and links to undergraduate research opportunities.

Microsoft PowerPoint. Students asserted that PowerPoint is an educational technology that should be integrated into courses when appropriate. They felt it enhanced their learning by providing visual demonstrations of difficult concepts and by helping them focus on the content of lectures and understand the organization of lecture topics.

When PowerPoint is used ineffectively, students reported that they tended to disengage from the lecture. Ineffective uses, as defined by students, included content that is "word-for-word" from what will be discussed in lecture, a lack of software proficiency among instructors, and slides that are difficult to read.

"It's a lot easier if students teach students."
-Undergraduate student

Discussion boards. Students stated that an integral part of understanding course concepts is collaboration with peers. Students reported that discussion boards, a learning technology that allows participants to discuss course topics online, respond to each other's comments, and share ideas, are being utilized to facilitate this collaboration, enhancing communication both from student-to-student and student-to-instructor perspectives. Furthermore, students appreciate this tool for its ability to provide a highly organized, timely, and easily accessible manner to gather information. These benefits have resulted in helping students explicitly request that discussion boards be incorporated into every course at the university.

E-mail. Students also stated that they prefer e-mail as the primary mode of communication between students, professors, and teaching assistants. Reasons given by students for this preference included its ability to archive and organize messages, the convenience of asking questions without attending office hours, and the ability to disseminate information from one person to an entire listserv.

Web-based research. The Web was reported by students as a technology used to create connections between course content and real-world applications. Students described researching on the Web to be convenient, often eliminating the need to physically visit the library. Students also described this technology as a tool useful to research future career opportunities.

Additional Technologies Students Use

Both students and faculty thought that PowerPoint, discussion boards, e-mail, and Web-based research were vital technologies for higher education. However, students also wanted to have additional educational technologies incorporated into their course work that were not addressed by faculty.

Instant messaging. Students stated that they are widely using instant messaging, which is creating a new social context for learning. Students thought this tool was helpful because it facilitated collaboration between peers and allowed questions about course content to be answered in real time. Instructors in the focus groups did not discuss this technology being utilized in the university community.

Microsoft Excel. Students felt that Excel is an educational technology that is valuable to integrate into their academic experience. Students described Excel as a tool that enhances their learning by providing meaningful images of what numbers are expressing.

Video clips. Some students use video clips in conjunction with lecture material to reinforce information presented in class. Students described video clips as an educational technology that creates bridges between the knowledge provided in course work with larger societal concepts (e.g., how mass media has conveyed historical events versus what is being read in history courses). According to one undergraduate student, "Video clips connect the real world, what's going on in today's business or society, with what we're learning in class. Then you don't think you're wasting time in school while the world is passing you by."

Students' Preferred Instructional Methods

Students articulated a preference to learn technology where they can receive instruction and help on a one-on-one basis, in a smaller setting, and within the context of a class. Students also want an environment in which they can gain hands-on experience combined with visual and verbal prompts. Independent learners described a desire to learn how to use technology on their own time with a handout.

Students also described a preference to learn technologies by repetition, first developing fundamental skills and then building on this knowledge to complete more advanced tasks utilizing technology. They expressed frustrations with technical assignments that required advanced skills when they have not yet mastered the more basic skills. Students requested that they be notified early in the course of projects that require advanced technical skills so they can develop the basic skills necessary to complete the assignment.

Students want instruction in technological skills to be competitive in their future careers. Unfortunately, students did not demonstrate an awareness of the present resources available to them. They believe they need greater resources and easier access to assistance on how to effectively use technologies campuswide.

Faculty Barriers to Integration of Technology

When we conducted faculty focus groups to gain an understanding of the entire university community's expectations of technology, we found that faculty recognized students' expectations to have technology integrated into their educational experience.

Faculty stated that they are incorporating educational technology into their curricula largely because of student expectations and their belief that technology is here to stay. However, faculty identified many barriers preventing the adoption of educational technology, including lack of skills on the part of the faculty, lack of resources, and lack of time. The faculty want the university's support to overcome these barriers.

> "I'm feeling like a Pony Express rider when the telegraph came along."
>
> *-Faculty member*

Self-perceived efficacy. One of the greatest barriers instructors discussed to using technology is their self-perceived efficacy with the tools. Instructors in the focus groups stated their students' skills far surpass their own and expressed a desire to close this gap. One faculty member shared this concept explicitly: "I'm feeling like a Pony Express rider when the telegraph came along."

Many faculty noted that they would like to have individuals come to their offices to demonstrate technical skills on their own equipment. Faculty would like to have those individuals not only be competent with the technical aspects of the tools but also be able to assist them in aligning the technology with their pedagogical needs.

As one faculty member summarized, "We need more people who really are experts, not just in the computers and the software, but in the kind of academic applications and problems that we deal with as opposed to industry or private business."

Lack of equipment. A lack of equipment available from the university was another barrier to technology adoption for faculty. Instructors described frustrations with the lack of technology in their teaching environment and noted that although the newer buildings were a step in the right direction, the majority of classrooms were not adequately furnished.

Specific tools defined by faculty as needed in the classroom included projectors, laptops, in-class Internet access for students, and a podium with advanced technological capabilities. These findings were also supported in the faculty survey investigating the use of learning technologies on the University of Washington campus. When faculty were asked to rank their most preferred technology available in the classroom, 43 percent of the respondents described classroom overheads as the most preferred technology followed by multimedia computer projectors (37 percent), laptop hookups (17 percent), and VCRs (3 percent).

Culture of educational technology. Faculty described the culture surrounding educational technology as another barrier to its adoption. They stated that the university's present culture of appropriate educational technology use is still in its nascent form. The perceived wide variation of technological abilities among faculty members in the same department sometimes hindered communication between instructors. Faculty expressed concerns that they are not at the same level of integration as their colleagues and described communication between instructors about technology to be strained because of the wide range of technical abilities in their community.

Lack of time. Many instructors did not want to learn how to use technology because of the time that it requires. However, these faculty members still recognized student expectations to use technology in their course work. They were greatly relieved to delegate technology-related

tasks to the libraries, departmental Web managers, classroom support services, or other similar technical support staff. By delegating an unfamiliar technology task to someone else, instructors had increased time to focus on the content of their courses.

"Sometimes I feel that with the demands of everything else we're supposed to do, that the push to use technology to improve learning can be one more thing that can be burdensome."

-Faculty member

Integration of Educational Technologies

When looking at our data, we found a large discrepancy between students' expectations that educational technologies be incorporated into their course work and the actual faculty integration of these tools into the curricula. With the goals of meeting student desires to have technology in their education and assisting faculty in adopting a learner-centered environment, we developed and implemented several recommendations.

Educational technologies. Our findings indicate that students feel that PowerPoint, discussion boards, e-mail, Web-based research, instant messaging, Excel, and video clips enhance their learning. Considering the many powerful student-defined advantages to these technologies and the enduring challenge to implement learner-centered design, we recommend instructors aim to integrate these particular technologies into their curricula.

Building blocks. To facilitate a smooth integration of educational technology into a curriculum, we recommend that technologically oriented assignments build on one another. Students are frustrated when faculty assume they are proficient with advanced technologies. As a result, when faculty plan their curricula, they may wish to consider presenting and instructing students how to use technology in a progressive manner. For instance, if students are expected to create their own Web site by the end of the quarter, instructors may want to assign homework throughout the course to go through the process of Web site development step by step.

Basic technology course. In our study, students described a need to learn how to effectively use technology before graduation. However, when we begin to investigate this desire from a holistic perspective, there are clearly many distinct barriers preventing faculty from teaching students how to use technology before graduation. In response to these barriers, we recommend that universities and colleges require students to enroll in a course teaching basic technical skills. This technology course would aim to ensure that all university and college graduates have a minimum capability to utilize technology effectively and efficiently in their future careers.

This course could be instituted in a variety of ways. Universities and colleges could develop linked courses teaching students the required technical skills for particular courses. For example, if students are required to create a Web site by the end of a class, the university or college could provide an online course teaching students how to use the software required for the creation of a Web site. Institutions may also consider offering one-credit technology labs for students to take in conjunction with courses when appropriate. These responses will shift learning how to use required technologies outside of the faculty's limited class time.

Development of Educational Technologies

Educational technology development is an iterative process. Research is conducted in and around the uses and perceptions of technology, and this information is subsequently used to inform the design and development of the tools. Throughout the Listening to the Learner study, students and faculty provided valuable feedback about various educational technologies used at the university, which resulted in the following recommendations aimed at enhancing educational technologies.

Course Web sites. Students stated that the content and design of course Web sites should be consistent. Furthermore, specific components that they defined as helpful to their educational experience included anonymous feedback, homework solutions, grades/grading criteria, links to undergraduate research opportunities, and discussion boards. We recommend providing simple prompts in course Web site management software to assist faculty in the integration of these components into their Web sites.

Instant messaging. We recommend universities and colleges research how students use instant messaging for

academic purposes. Once the uses of this technology are better understood, developers may wish to consider integrating instant messaging software into educational technology suites.

Organization of Technology Support

Our findings indicate that a reorganization of technology support is necessary for the smooth adoption of technology into higher education. This reorganization has three focal points: the culture surrounding technology, educational resources, and technical equipment available in the classroom.

Culture surrounding technology. Technology adoption can thrive only in a culture that supports it. Yet, in our research, we discovered that faculty describe the culture and support surrounding educational technology to vary widely. One reason for this variation is that teaching is sometimes an isolating experience, which can inhibit dialogue about technology among faculty members. As a result, we recommend implementing new modes of communication among departmental colleagues that address the integration of technology into their curricula. This will facilitate a culture where educational technology is openly discussed.

- *Departmental Web sites* are an effective medium to facilitate faculty communication. We recommend providing links on these sites to concrete examples demonstrating how individuals in a department are utilizing learning technologies.
- *Personal profiles* on Web sites provide faculty an opportunity to communicate and share their experiences with technology. We recommend providing instructors an opportunity to create personal profiles to share with colleagues.
- *Informal events* that bring knowledge builders together to reflect on educational technologies may increase faculty communication about technology. This could be implemented through a monthly informal discussion such as WebEd, which is a PETTT-hosted event where faculty and researchers come together to share information about educational technologies. These discussions have proved successful, as the new and interesting research and experiences about technology on campus are disseminated across the university community.
- *Incentives* are the final recommendation to enhance the culture surrounding technology. We recommend recognizing faculty that have emerged as leaders of technology integration during the tenure review process. This will serve as a formal method to inspire faculty to adopt technology into their teaching.

Educational resources. To facilitate a strong organization of technical support, colleges and universities may wish to consider providing increased resources to train faculty and students how to use technology.

Some faculty have found that guided online tutorials addressing both pedagogical and technical concerns surrounding effective uses of technologies in a curriculum are helpful. We recommend the development and implementation of this scalable tool to serve as a support to faculty in learning and integrating technologies into their curricula.

Students and faculty are often unaware of the existing educational resources to develop their technical skills. Therefore, we recommend that resources currently in place be more effectively advertised. This includes advertising technology skills workshops in the libraries, on the campus Web site, and in the university newspaper.

Technical equipment. In our study, faculty identified the lack of technical equipment available in classrooms as a barrier to technology adoption. We recommend that university and college communities place a high priority on providing learning environments where technology is readily available. This includes providing the four most commonly desired resources widely across campus classrooms: overheads, multimedia, laptop hookups, and VCRs.

In addition, classrooms that are properly equipped to accommodate the use of educational technologies need to be more readily accessible. We recommend achieving this by developing an easy-to-use database that can identify available classrooms that meet the technical needs of instructors.

Faculty Training

Faculty emphasized the importance of using learning technologies in a manner that does not separate pedagogy from technical training. As a result, we recommend that universities and colleges implement an instructional

method where individuals assist faculty not only in the technical aspects of the tools but also in the alignment of technology with instructors' pedagogical objectives.

Consultation. We recommend the development of consultation services for faculty addressing pedagogy and technology. PETTT has successfully developed a consultation service and discovered that this method of faculty instruction has promoted an integration of technology across the university community that innovatively enhances teaching practices while meeting faculty training needs.

Delegation. In our study, there were faculty members that were not interested in learning how to use technology. These individuals found great relief in delegating technology related tasks to others. For this group of instructors, we recommend raising awareness of the current support available to them from the libraries, departmental Web managers, and classroom support services.

We also recommend the creation of a new position to relieve faculty of the perceived burden of learning how to use technology: the technical teaching assistant. These trained individuals could help faculty overcome the challenges of technology adoption by acting not only as a resource for faculty but as a means to train students how to effectively use learning technology.

Conclusion

This study facilitates a vision of the future, a future where technology becomes a well-integrated, vital tool in the higher education environment. By listening to college and university communities, we are challenged to define and recognize the existing discrepancy between the students' desires to use technology in their course work and actual faculty integration of these tools into their curricula. Our findings illustrate a need for future research investigating this discrepancy, aiming not only to listen to what university and college communities expect of technologies but also to develop and implement successful recommendations for technology adoption. It is only when institutions begin to respond to what has been heard that this discrepancy may be resolved.

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Chapter 2

Environment/Behavior Basics

You felt it. The hair stood up on the back of your neck. You knew you had to go into that dark parking garage to retrieve your vehicle. While walking through, you heard a noise. You froze—listening. No more noises. You hurried to get into the vehicle and lock the door, breathing a sigh of relief. You started the engine, still shaking.

The behavioral response depicted in this scenario is known as the "fight or flight" response[1]. This behavior is a result of "instinctual drift", or the "tendency for all organisms, when under pressure, to resort to and exhibit their natural tendencies. It is part of the genetic programming"[2 (p. 42)]. Three important instinctual drift tendencies (IDT) relating to the built environment as described by psychologists' or social anthropologists' research will be reviewed here. For more than thirty years, researchers have been studying the relationship between a human's behavior and his or her physical environment[1,3,4,5,6,7,8]. Designers and planners must understand these classic environment behavior tenets and use them to support the users' well being. We have the ability to alleviate some stress by paying attention to this body of knowledge and skillfully applying its principles. The following IDTs were developed by the pioneers of this research area and are considered constant: territorial, situational, and personal space behavior.

Territorial Behavior

Look around you. When you sat down at this table, what did you do with your personal belongings? Is your coat on the chair beside you, your bag on the chair opposite? If so, you are doing what comes naturally—marking your territory (even if the mark is only temporary).

Human territorial behavior is a complex phenomenon. Altman[1,3] as a pioneer in the field of environment/behavioral research, worked to explain this condition. He defined four basic concepts for human territorial issues: behavioral forms, situational factors, antecedent factors, and orgasmic and social needs.

Behavioral forms refer to the need to use environmental props to mark or defend a territory. For example, a fence marks one's property line; a wall around a person's office marks that individual's 'home base'. If these "props" are crossed without invitation, defensive or aggressive behavior can result. These types of behaviors may consist of physical, verbal, and nonverbal clues[9,1]. However, territoriality is not just about place. People display possessiveness toward objects, individual relationships, and ideas[3,9]. The rights to intellectual property and patents are examples.

Situational factors explain that as circumstances change, so does the amount of space required to conduct an activity. For example, a faculty member presenting material to a group of 600 students needs different spatial attributes than when he or she presents the same material to a group of 50. That illustration just makes for common sense, but some situations are more complex.

The antecedent factor argues that relationships between certain individuals or particular groups of people are influential in stimulating behavior[1]. This type is illustrated when leaders appeal to a known value in their constituents and that appeal stimulates a riotous response (e.g., a declaration of war and the mobilization of armed forces to carry out the orders).

Lastly, Altman[1] argues that humans have basic survival needs (e.g., food, shelter, procreation) and a compulsion to associate with like social groups (e.g., tribes, gangs, clubs).

These four behaviors provide a basis for understanding territorial phenomenon. In a corporate setting, these needs are addressed through communities of practice, while in an educational setting it may be more discipline specific. The social anthropologist E. T. Hall[4] added to Altman's situational attributes, revealing details on a more micro level.

Situational Behavior

E.T. Hall's[4] notable research studied situational behavior, arguing that by understanding situational needs, humans may better understand how to build environments supporting those needs.[10]

Situational behavior refers to circumstances when a personal or social distance mechanism is triggered. Personal distance refers to an "invisible bubble"[5] surrounding each person. Hall characterized these bubbles as ever-increasing concentric circles moving away from the person, and named his discovery "Proxemic Zones"[4]. Each of these zones has both a close and far phase. The four zones are intimate, personal, social, and public. Within each zone, certain behaviors are acceptable and cause no undo stress. The social parameter provides a measurable distance that a member of the social group is allowed to stray away from the group without causing alarm or concern for safety. For broad attributes of these zones, see Table 1.

The row-by-column seating arrangements found in most traditional classrooms, lecture halls, churches, and theaters are examples of how we design settings that violate the intimate Proxemic zone. No one wants to sit next to a stranger without a protective barrier. It is stressful to keep up a protective stance for long periods of time. Even an arm on a chair is of some help, but what do we do in a movie theater when we have to share that arm? We are uncomfortable. Yet because as humans we are so incredibly adaptive, we tolerate situations that other animal types would not. These settings appear to be designed for economic gain rather than personal wellness.

Altman writes, "By moving closer to or away from other people, we change their accessibility to us. By moving away, we signal a desire for more privacy and use personal space as a mechanism to shut off certain channels of communication. By moving closer to someone, we permit greater access to our self and open up an increasing richness of communication"[3 (p. 61)]. Each individual controls the regulation of other persons into any one of the zones. When another person violates the prescribed behavior, a flight or fight signal[1] is triggered (i.e., IDT response)[2]. Thus, our personal space and how we perceive it is critical. The next researcher provides a more in-depth look at the elements of personal space and some contributing factors to the perceived success, or lack thereof, of those spaces.

Table 1: Situational Behavior—Proxemic Zone Attributes

Attribute	Proxemic Zones * Intimate	Personal	Social	Public
Distance **	0 inches–18 inches	18 inches–48 inches	48 inches–12 feet	12 feet–25 feet plus
Sensory Information	• Vision is blurred • Smell and sense of touch are fully engaged • Body heat is experienced • All senses are heightened	• Normal vision • Smell is strong and touching is engaged • Body heat is experienced	• Reduction of: sense of smell, ability to touch, visual details • Voices get louder • No body heat sensed	• Facial expressions and gestures are exaggerated • Considered a formal distance
Accepted Behavior	• Physical contact • Kissing, hugging, nursing, or procreation	• Grasping to just touching • Holding hands, walking arm-in-arm	• No physical contact • Impersonal business occurs • Interaction among casual acquaintances • Space used to screen others out	• No physical contact • Formal behavior

* Adapted from: Hall, E.T. *The Hidden Dimension*. NY: Doubleday Press, 1966.

** Distances indicate both the close and far phases for each zone

Personal Space Behavior

Robert Sommer[5] describes personal space as "an area with invisible boundaries surrounding a person's body into which intruders may not come" (p. 26). He further suggests that personal space moves with a person as his or her own "portable territory" (p. 27). The maintenance and protection of personal space is accomplished through the use of a combination of gestures, postures, and environmental props[9]. An example might be the manner in which a lecture hall or theater is designed. The hall is set up to accommodate a formal, public proxemic zone. Distance creates a barrier and often a stage is elevated and lit to emphasize that area. Learners are literally "in the dark," the presenter may maintain some anonymity, and the setting is not conducive to exchange of either verbal or nonverbal signals (see Figure 1). It does not mean the setting design in this example is good or bad, but rather demonstrates how it supports an underlying behavioral function.

Personal space is an area with invisible boundaries surrounding a person's physical being into which intruders may not come.

Sommer presented two other situational conditions relating to the impact of personal space on communication factors. Both conditions address how humans adapt to situations relative to their ability to use their foveal or peripheral vision. He defined foveal vision as "an area of the retina containing only cones and affording acute vision"[11] (p. 399) or as the line of sight providing clarity of an object, which may be thought of as frontal vision. Peripheral vision, he suggested, is the view from the very edges of the eyes when one is looking forward[11]. This view is blurred and items are not clearly focused. Sommer called these visual conditions supporting visual applications "Sociofugal" and "Sociopetal". In a Sociofugal (items in a single line, or linear) scenario, the foveal, or direct line of sight, viewing range is protected, or channeled. A crowded, row-by-column classroom seating arrangement where direct eye contact is primarily maintained between learners and the faculty member in the front of the room illustrates this point. Learner-to-learner eye contact is not easily managed. Chairs arranged in rows only allow a learner sitting behind another to see the back of someone's head or the presenter. Only by adjusting body position can a learner have direct eye contact with someone in another row. However,

moving draws attention to that learner. Other examples of this situation include side-by-side airport seating and doctor's office side-by-side seating, or rectangular boardroom settings (see Figures 2A, 2B). In each case, the intimate proxemic zone is violated. Yet, due to the fact that direct eye contact is channeled and there is often a small physical barrier (i.e., arms and backs on chairs), people accept or tolerate the situation for short periods of time, though not necessarily without stress. We have all observed situations where one stranger positions him- or herself so as not to sit next to another unless there is no other choice (e.g., overcrowded conditions)[10].

In the Sociopetal condition outlined by Sommer[5], direct eye contact is maximized. Eye contact is deemed important and necessary in order to maintain participatory engagement. The metaphor for Sociopetal arrangement is radial balance exemplified by a flower (i.e., petals around a center, or radial). Some examples of this type of behavioral setting may include: (1) teaching in the round, (2) dining settings, and (3) seminar areas. The important underlying principle is to maintain eye contact easily for all participants without much bodily movement. An egalitarian approach is used in this setting for sharing knowledge. When people are seated around a table, particularly a round one, the intimate zone is usually not violated as chair spacing maintains the personal zone and a comfort level for each individual. See Figure 3.

Figure 1:
Focal Point—Public Proxemic Zone (Sociofugal Arrangement)

Presenter's Space
- 1/3 of total space is dedicated to one person
- Knowledge is from one source
- Projection is predominantly one way
- Public Zone distance (12 ft+) is maintained

Receiver's Space
- Row by column seating (all in a line)
- Eye contact is at presenter or presentation

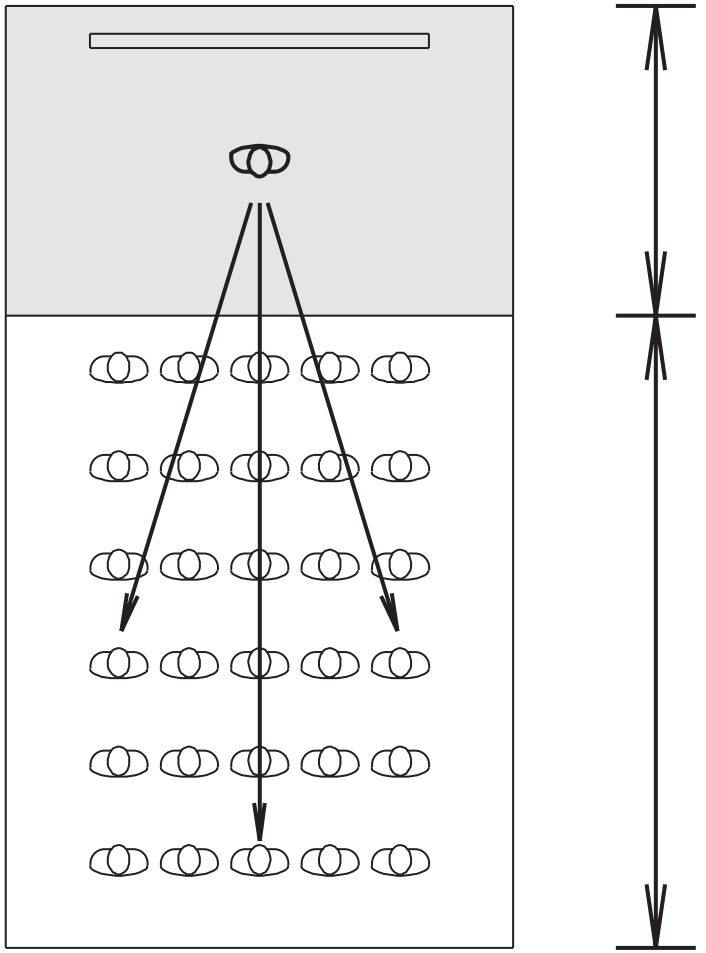


Figure 2A:
Sociofugal Arrangements (Linear)

Example: Airport / Doctor's Office Setting

- Interruption of intimate zone (minimal territorial protection)
- Foveal vision minimized (direct eye contact)

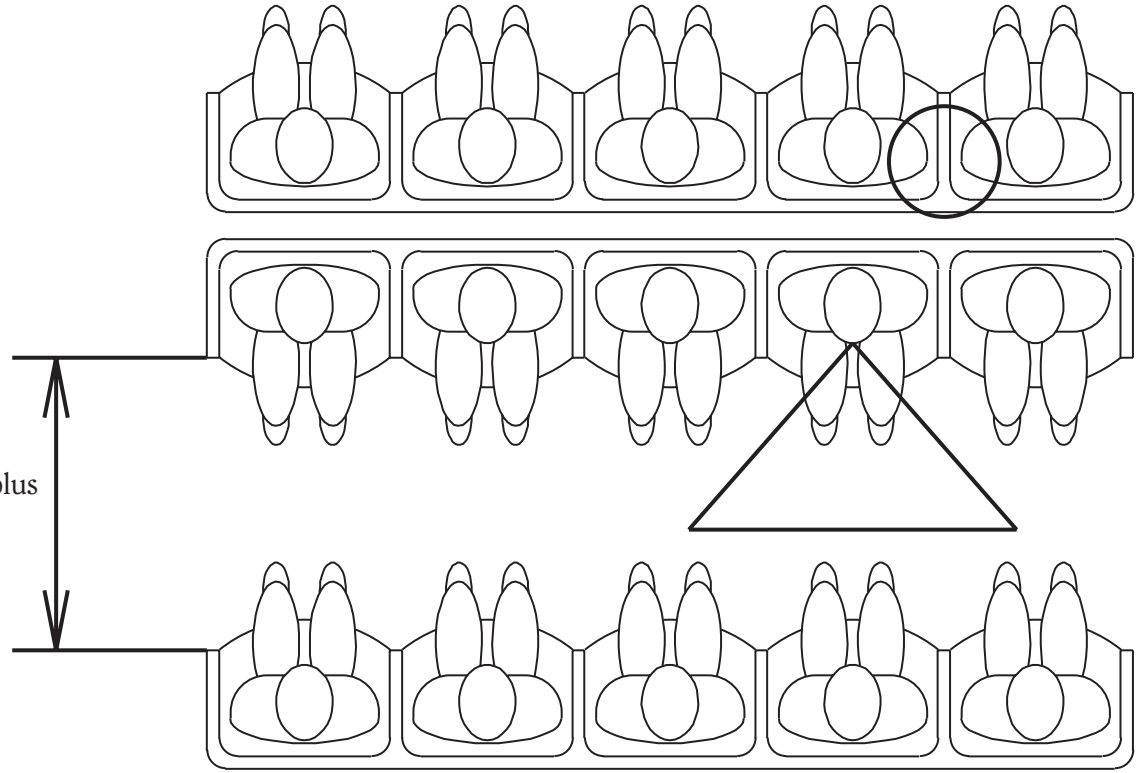


Figure 2B:
Sociofugal Arrangements (Linear)

Example: Boardroom Setting

- Interruption of intimate zone (minimal territorial protection)
- Foveal (direct eye contact) vision maintained only with those sitting directly across

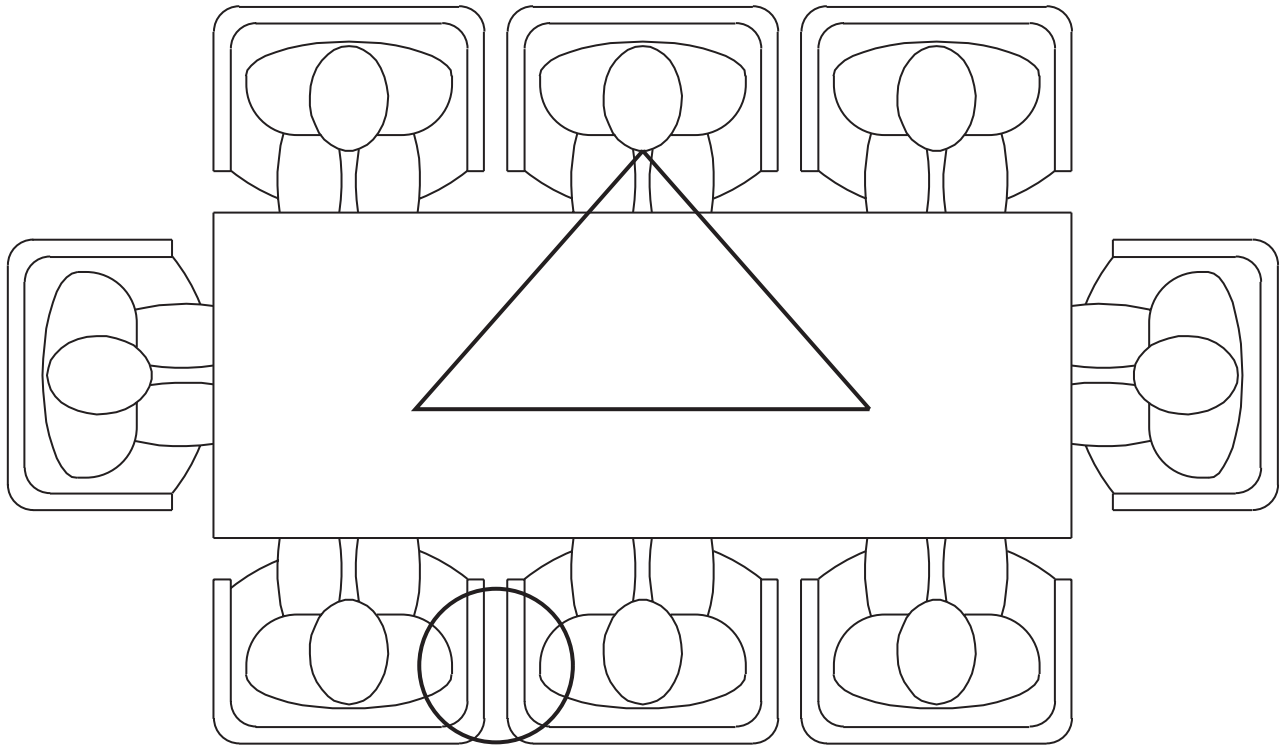
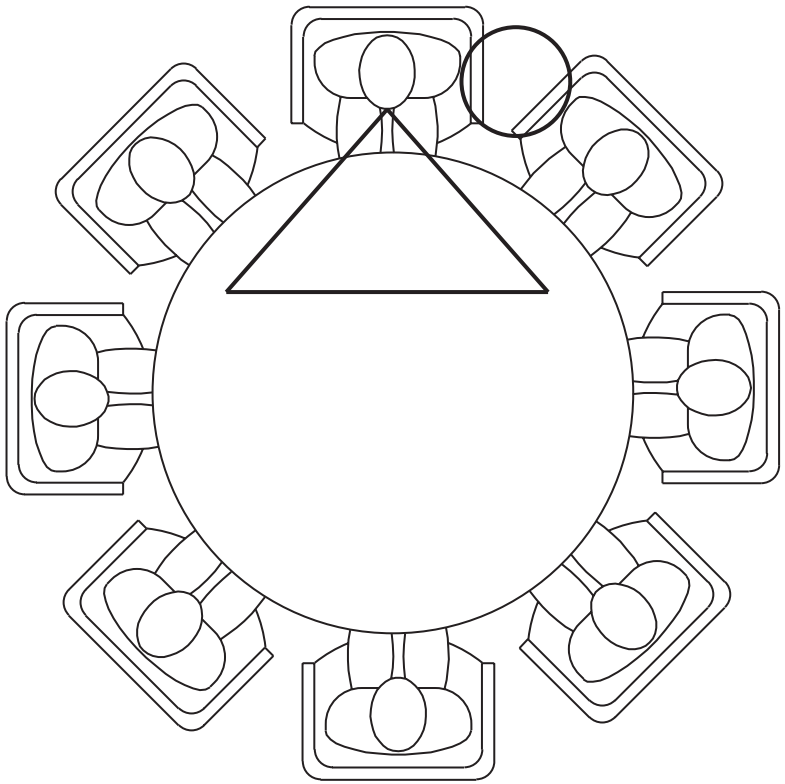


Figure 3:
Sociopetal Arrangement (Radial)

Example: Seminar or Dining Table Setting

- Knowledge is from multiple sources
- Intimate zone intact

- Foveal vision opened up (due to radial arrangement)
- Minimal territorial protection



Recognition of situational behaviors and sociofugal/sociopetal elements provides designers and planners with a better understanding of how solutions may be appropriately applied.

Another important component of the environment/behavior picture should be mentioned. Michelson[12] explains: "Man, as a thinking being, relates to his spatial environment both in his mind and in his actual presence" (p. 30). This suggests a mental and experiential congruence between people and their environment[9]. Further definition[12,9] is helpful:

- Mental congruence indicates that a person feels that his or her personal characteristics, values, and life styles are accommodated by particular spatial patterns.
- Experiential congruence is defined by how well the environment actually supports the functions, characteristics, and behaviors of people using it.

This idea proposes that people use both congruence indicators when evaluating environment/behavioral fit[9]. Figures 4, 5A, 5B, and 5C summarize the person/environment/behavioral conditions for consideration when developing solutions for the built environment. In Figure 4, a dashed line around the individual represents the core needs of that person (i.e., the intimate zone as defined by Hall[4]). Protective barriers should surround at least 2/3 of this core (sometimes completely, as in bathroom privacy needs), and no one should have his or her back exposed to the "door." Barriers are depicted as environmental props, or fences, suggested by the solid curved line. A view plane (shown as a triangle) should provide visual access from the individual at the core into the next area, the personal zone. The personal zone is represented by the atmospheric "bubble" or the outer semi-circle with a dashed line. This space provides opportunities for dyadic (one on one) interaction at work, or where friends gather. A partial barrier or movable screen could be used for more privacy (represented by a heavy dashed line at the bottom of the figure). A view into the social zone is also required. This view extends then from the social zone back into the personal. Traffic lanes or team spaces are planned for activities in this outermost area allowing several people to come together in a "common" space, away from the "home base" or core protection zone.

Figure 4:
Individual Proxemic Condition—
Individual's Core Needs

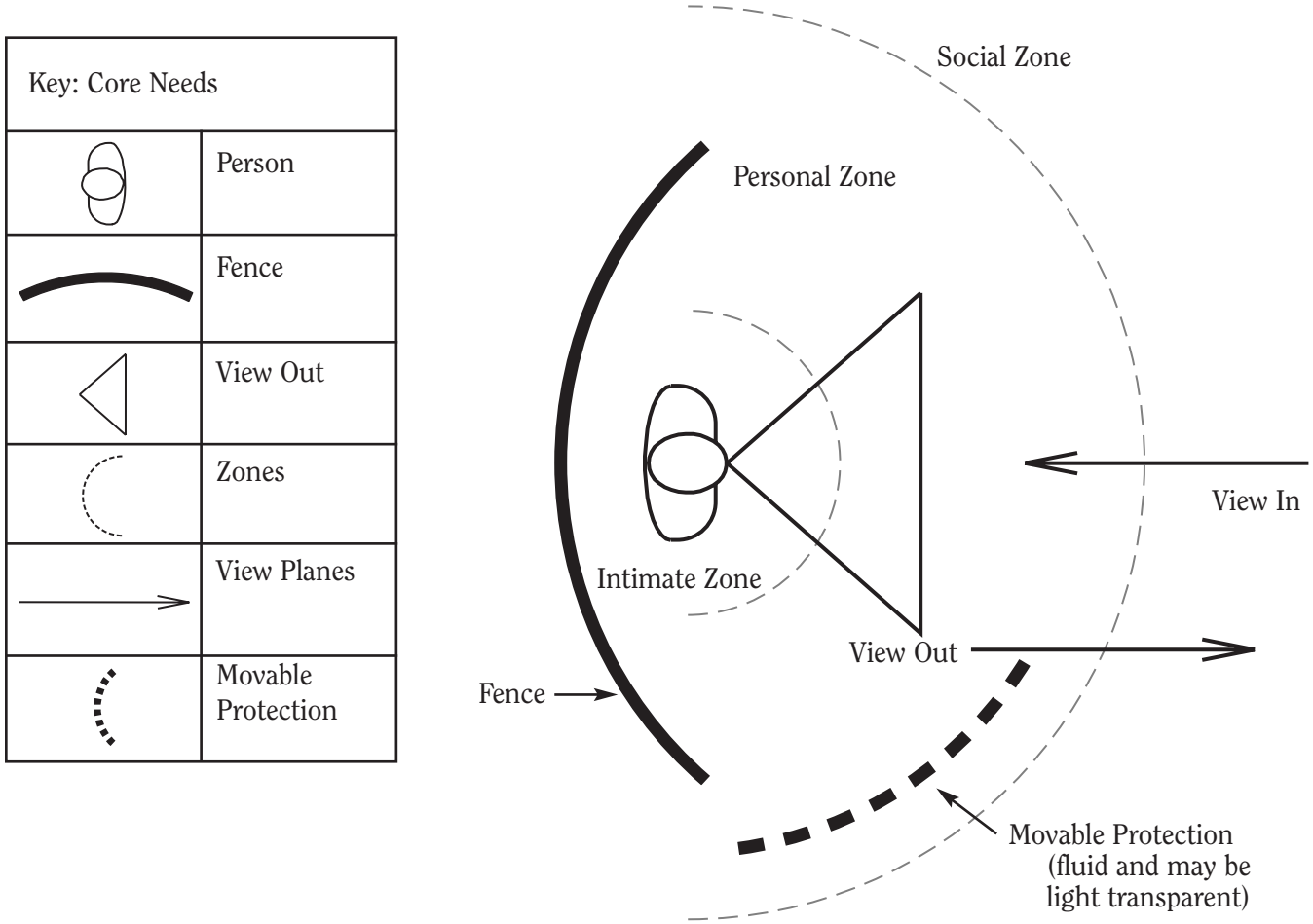


Figure 5A:
Impromptu Team Conditions—
Multiple Core Arrangements

- Team Members

Key: Core Needs	
	Person
	Fence
	View Out
	Zones
	View Planes
	Movable Protection

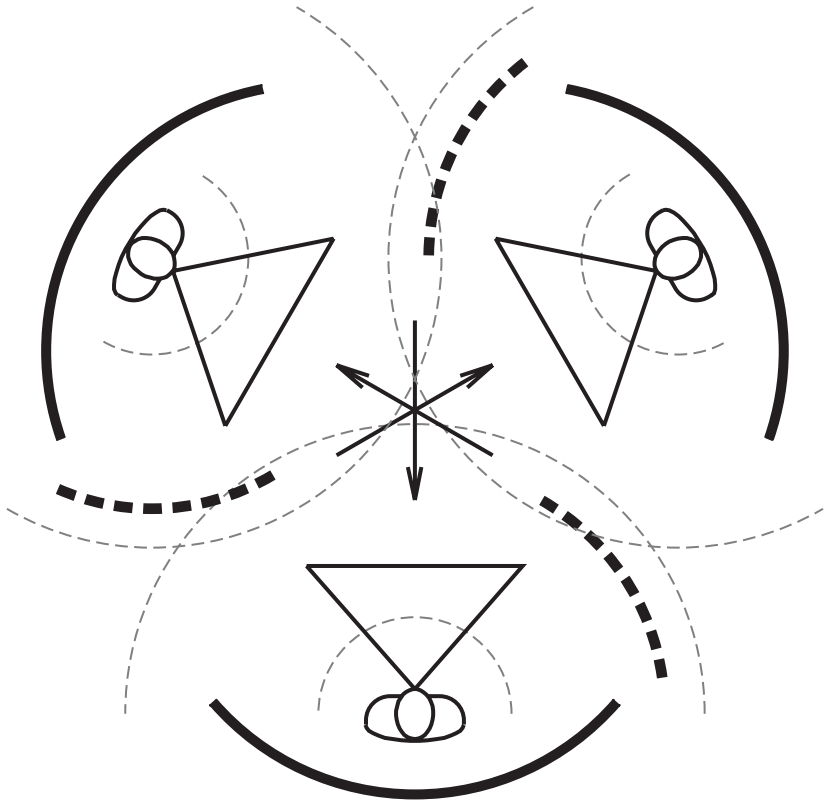


Figure 5B:
Project Team Conditions—
Multiple Core Arrangements

- Project Members
  (more room is required
  for artifacts and traffic flow)
  (area should be protected from public)

Key: Core Needs	
	Person
	Fence
	View Out
	Zones
	View Planes
	Movable Protection
	Path Through

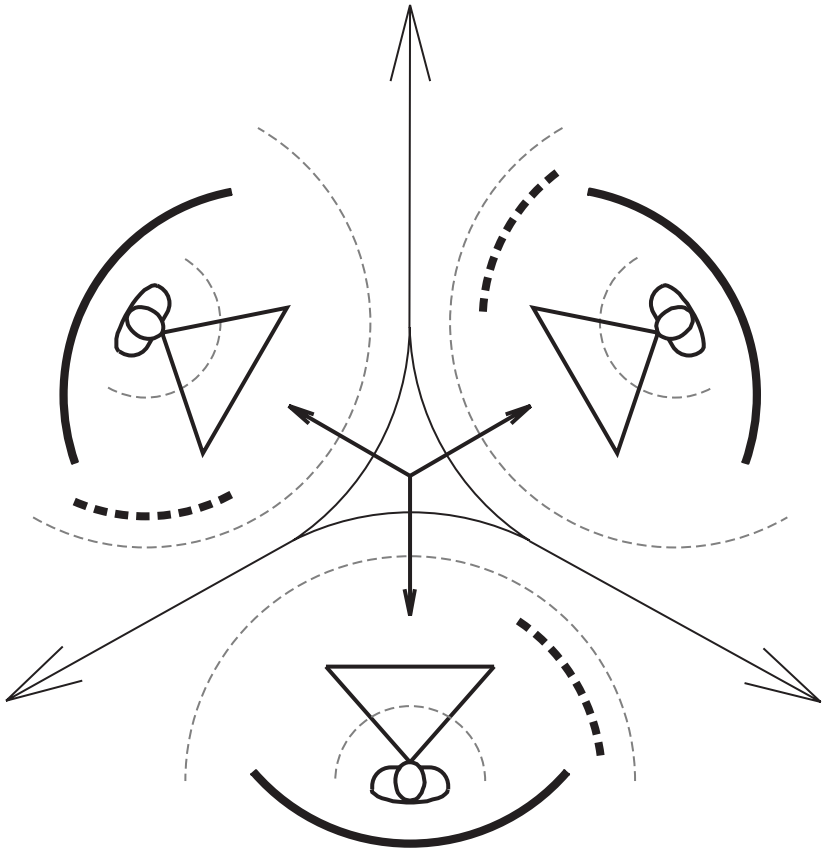
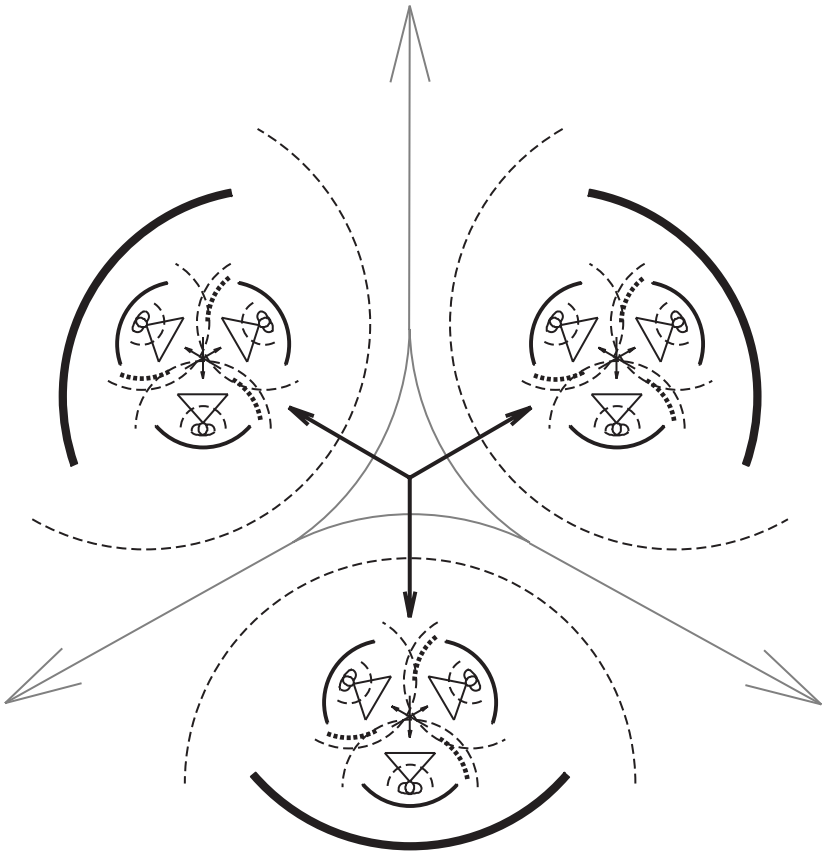


Figure 5C:
Individual Conditions—
Multiple Core Arrangements

- Groups of Separate Teams
  (become the new core)

Key: Core Needs	
	Person
	Fence
	View Out
	Zones
	View Planes
	Movable Protection
	Path Through



Figures 5A and 5B show multiple individual conditions for impromptu and project teams. At a more macro level, the symbol for an individual can be substituted for a group (as in Figure 5C). The group acts as an individual in this arrangement.

This brief explanation of environment/behavior research may help designers and planners recognize IDTs[2] and situational behavior patterns[1,3,4,5], and plan accordingly. The message is clear. People react predictably to environmental conditions. Englich and Remmers[13] summarize this phenomenon.

> The obvious conclusion that people, as creatures who think and behave in instinctively territorial terms, and have hardly changed with regard to their fundamental needs and patterns of behavior for thousands of years, is underpinned by anthropological theses; they assume that it takes 600 generations until learned behavior becomes hereditary, instinctive behavior.(p. 5)

A summary of environment/behavioral research crystallizes several key points. First, that the built environment impacts behavior. Second, behavioral responses are primal and thus, humans' basic situational responses are deemed predictable. Finally, evidence suggests that proper planning can support intended behavioral outcomes.

Therefore, designers and planners should become familiar with and understand this research discipline's contribution in order to plan spaces supporting basic human requirements both at the macro and micro levels. This context provides an understanding of the challenges of moving from the models of the Agrarian and Industrial Ages into the Knowledge Age. Initially, it is necessary to explain the remnants inherited from the models of the previous ages.

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Program Title

G200 | WC3 | Society for College and University Planning
Provider Number | Program Number | Provider Name

Name of Person submitting this report: _____

Phone number: _____

Date of Program Completion: September 27, 2004 **Your Location**: _____

Participants at this program eligible to receive AIA learning units, should complete the area below and return the form to the Society for College and University Planning (instructions below)

(Please print or type) Learning Units: 1 ½ hours

	AIA Member Yes or No	**AIA Membership Number (required if member)**	**Name of Participant and Telephone**
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2.	❒ Yes ❒ No		
3.	❒ Yes ❒ No		
4.	❒ Yes ❒ No		
5.	❒ Yes ❒ No		
6.	❒ Yes ❒ No		
7.	❒ Yes ❒ No		
8.	❒ Yes ❒ No		
9.	❒ Yes ❒ No		
10.	❒ Yes ❒ No		
11.	❒ Yes ❒ No		
12.	❒ Yes ❒ No		

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Scale Definition: **P - Poor** **F - Fair** **G - Good** **VG - Very Good** **E - Excellent**

	P	F	G	VG	E
1. Overall rating of program	☐	☐	☐	☐	☐
2. Similarity of actual program content to advertised content	☐	☐	☐	☐	☐
3. Ease of registration	☐	☐	☐	☐	☐
4. Audibility of seminar	☐	☐	☐	☐	☐

Presenter: Overall Effectiveness

	P	F	G	VG	E
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6. John A. Pfleiderer	☐	☐	☐	☐	☐
7. William F. Thomas	☐	☐	☐	☐	☐
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