

Groups as Systems

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People thought for centuries that dissecting, reducing, and taking things apart was the best way to learn about something. Scientists examined an entity by analyzing each individual component, further splitting the elements until the smallest part could be scrutinized. This way of looking at the world was popular until the twentieth century. Then a new approach to understanding began to surface: the systems approach.

In 1952, Ludwig Von Bertalanffy, a theoretical biologist, identified this new approach as general systems theory. General systems theory allowed a new way to think about and study the interactive and dynamic alterations of living phenomena (Von Bertalanffy, 1952). According to this theory, a system is a structure of an organized set of interrelated and interacting parts that maintain their own balance amid the influences of the environment.

Social scientists, psychologists, and organizational theorists began to see systems theory as a way of explaining the complicated dynamics of interpersonal relationships. In his book, *The Fifth Discipline*, Peter Senge (1990) explained human endeavors as “invisible fabrics of interrelated actions.” Senge observed, “Systems thinking is a conceptual framework, a body of knowledge and tools that has been developed over the past fifty years, to make the full patterns clearer, and to help us see how to change them effectively” (p.7). Applying this approach in the study of small groups is the next step to providing an awareness that groups are process-oriented, synergetic, and environmentally dependent.

Interdependence in Groups

When taken apart, a system, such as a group, loses its interaction and essential properties. Explaining one part of the group's process without taking the entire structure into account does not give an accurate picture, but thinking of groups as unparalleled, unique units allows a better understanding of why and how groups operate. In spite of this interconnectedness, analyzing small group process traditionally involved a division of the process into smaller, more manageable parts, such as roles, norms, size, and leadership. This fragmenting allowed an in-depth look at the different forces that take place within a group. But since groups are complex, ever-changing structures, reducing the process to individual elements and treating them as though they were independent, constant, and static prevents a clear understanding of how dynamic the groups process is.

Viewing groups as systems allows a deeper level of insight. Borden (1985) explained human communication systems as any dynamic set of interrelating components, at least two of which are humans, functioning to achieve an objective through communication among its components. Applying Borden's theory for general human communication systems to small group communication provides a solid foundation for examining what happens when people form groups and interact over a period of time to achieve a goal.

Interconnected and interrelating aspects of group process cause the members to be *interdependent*. Interdependence means that groups members can accomplish something as a whole that would be difficult or impossible for a single individual to achieve. However, this accomplishment can occur only when members can rely on each other to fulfill their roles and responsibilities. Moreover, only by looking at the system or group in relation to the internal and external forces affecting it can an appreciation of the complexity of group process be gained. Understanding *how* groups operate rather than merely concentrating on *what* they do gives a better picture of the wholeness of groups as systems. In other words, no one part of a system can be understood unless it is viewed within the context of the entire system.

Appreciating the complexity of a groups starts with understanding the system's *input*, the combination of the raw materials of the particular group and the interaction that results. Examples of raw material of the group would be the talents, education, experience, and maturity of the members. Since each individual of the group is also a separate, unique system, a group can be thought of as a system of systems, an unparalleled collection of raw material. The input of each person is changed to an *output* during the process of creating and modifying ideas in the course of the group's transformation and evolution.

Sometimes the output is concrete. For example, a committee that formulates a marketing strategy for a new product and then implements the plan for the company has produced a tangible output. Sometimes output is not so obvious, however. The subtle and radical changes among the group's participants and their decision are also examples of output. Katz and Kahn (1966) referred to the process of changing input to output as *throughput*.

Realizing that work groups make decisions is only part of appreciating *what* groups do, and considering output in isolation causes distortion. The process or throughput is important too. Group norms, power, leadership, goals, roles, and a host of other variables are all interdependent, and each influences the decisions the group makes. Any one component must be analyzed in light of the whole system, the group. Only then will a particular behavior be truly understandable (Wood, Phillips, & Pedersen., 1986).

The group's *purpose* and *size* also influence the interaction and interdependence. Social groups, whose sole purpose is to provide support for its members, will not usually need to rely on the members for financial gain or professional development. Instead, individuals form these types of groups when they want social interaction and will count on the other members to provide needed recreation and relaxation. In the case of adolescent groups, the members may even depend on each other for a large part of their identity. As Argyle (1983) pointed out, social groups in general, and adolescent groups in particular, have no specific task except to devise activities which entail the kinds of interaction which meet the needs of members. These invented activities such as dancing, eating pizza, and talking are the system's output. The parts of these groups mesh to form a system of support or maintenance.

A work group, on the other hand, has a task as its primary purpose. Work groups form when one person alone cannot achieve the task, when several types of skills are needed, or when people simply prefer the company of others (Zajonc, 1963). The parts of this work system need to influence each other effectively in order to accomplish some specific goal. Since understanding the purpose is crucial for success, the group's process, or *how* all the parts of this system relate to one another, will determine whether the group's work will be accomplished.

Another example of group interaction has to do with the group's *size*. As groups grow larger, the system becomes more complex. The interdependence is there but less apparent. Cohesion tends to be weaker and morale tends to be lower in larger groups than in comparable smaller ones. Perhaps this is truer of groups such as social groups that have the option to meet or not to meet, but the principle is noteworthy. If the parts of the systems are interrelated and interdependent, limiting the number of parts affords more opportunity for interaction. Bostrom (1970) found that people like to talk rather than listen in a group. Smaller groups provide this opportunity.

Group size is directly related to communication networks, a part of the overall system. As the size of the group increases, the network begins to bog down in the confusion. Larger groups tend to produce lower levels of satisfaction and weaker interpersonal relations among participants because people have fewer opportunities to interact with each other, and cohesion is compromised (Tubbs, 1988). Cohesion is particularly desirable in family or social groups, but its importance should not be minimized in work groups either.

Synergy in Groups

Viewing any system in terms of its context is the first step to understanding the *synergetic* effect of the system. Simply put, this means that $1 + 1 = 3$, or a system is more than the sum of its parts. Synergy occurs when the group's performance or accomplishments surpass the capabilities of the individual group members. In other words, the group's unique combination of talents, knowledge, and experience is greater than the sum of the individual contributions. The ideas of one member often trigger a response from another person that neither would have thought of independently. The vitality of one individual can spur others on when their energy wanes.

Synergy can take either a physical or a mental form. The physical presence of others is often arousing, so more work is accomplished. Even ants work harder when there is more than one of them on the job (Zajonc, 1963). In the mental sense, synergy forms when a type of collective intelligence and shared memory begins to develop as the group matures.

Senge described this development as a kind of aligning during which a commonality of direction emerges, and individuals' energies harmonize. He said that a resonance occurs that is "like the 'coherent' light of a laser rather than the incoherent and shattered

light of a light bulb” (Senge, 1990, p. 234). There is commonality of purpose, a shared vision, and understanding of how to complement one another’s efforts.

A system is a collection of parts that interact with each other to function as a whole. If something is made up of a number of parts that do not interact, and the arrangement of these parts is irrelevant, this is a pile of materials rather than a system. For example, a pile of bricks is a pile of bricks whether we add to it or subtract from it. Cutting it in half gives two piles of bricks and adding to it yields a bigger pile of bricks. Essentially, however, the mound of material remains a mound of material; but cutting a car in half does not produce two smaller cars.

To continue the car analogy, if the best parts of each type of automobile were determined, could the world’s best car be manufactured by collecting each of these parts and putting them together to make the world’s best automobile? Taking the engine from one type of car, a transmission from another model, and a carburetor from yet another would not combine to create a system that would work. The parts would not be compatible and would not operate to make a functioning machine, much less a superlative mode of transportation.

Groups are even more complicated; they are *living* systems. Each person can be viewed as a separate segment of the system, but the effect of the interaction among them is more than the sum of the parts. The energy created by the members and the outputs of the group are the result of the dynamic relationships of the members who are constantly defining and redefining themselves, their behavior, and the functions of the group. Combined, the group members can do things that no one of them could do separately.

Each group is unique because each group member is unique. The group, then, becomes a system of people who bring to the experience an individualized genetic make-up, a personal life history, varying combinations of personality traits, differing values and attitudes, and a singular view of the world. Adding the input of these individuals together, however, still does not give a clear picture of what the group is or will do because each person is constantly changing due to the of association with the group; and the group is continuously reacting in response to this person’s membership. The group’s members will interact to *create* the group, a creation that will be like no other. The members’ behaviors, their verbal and nonverbal interactions, their strengths and weaknesses, their insights and talents will not only separate this group from all others; but it will also distinguish this particular group’s interaction today from this group’s interactions tomorrow.

The group’s synergy, or bonding of the system’s components, is a source of energy; and this bonding gives structure to the system, thereby reducing *entropy*, or disorder. Without an input of energy, an open system, such as a group, which is affected by other systems, will run down, and disorganization will occur.

The Domino Effect in Groups

This interconnection of the parts means that all divisions of the structure are changed when one piece of it changes. When one element alters, all others must adjust to accommodate it if the system is to survive in a healthy state (Wood, et al. 1986). This "domino effect" is apparent whenever groups interact because the effects of any action will cause consequences to ripple through the system. Explaining how or why an outcome occurred is very complex because all the reasons for a result are not obvious. Often group members never find the answers to their questions because they try to look at just one aspect of the group's system, which is frequently the most recent action of the group. No one answer is likely to provide the complete story. However, looking at the patterns of causes and effects might begin to bring the situation into focus. Thinking in terms of a specific cause for a given event in a system is futile and simplistic.

Even though groups are complex, the art of systems thinking lies in seeing *through* complexity to the underlying structures. Systems thinking does not mean ignoring complexity. Rather, it means organizing complexity into a coherent story that illuminates the causes of problems and possible remedies. Groups need ways of knowing what is important and what is not important, what variables to focus on and which to pay less attention to. Doing this helps groups or teams develop shared understanding (Senge, 1990).

The main principle at play is that groups never do just one thing. One action causes reactions which demand an adjustment within the system and among other systems. The group accommodates the changes and responds to them, or the system fails to thrive. Since systems are dynamic, they constantly change in response to internal and external challenges. Even the degree of interconnectedness among the group members will ebb and flow during the life of the system as the members and the surrounding environment change.

In addition to the existence of a complex system within the group, the group is rooted in countless other systems as well. Human systems are never closed (Miller, 1978). As Huse and Bowditch (1973) explained, since open systems are never completely closed off from the outside world, they are affected by the environment and, in turn, have an effect on the environment. Just as no part of the group's process can be considered in isolation, neither can the group be viewed apart from the environment, the group's *supra-system*.

Individual groups are parts of many other systems such as the organization, the community, and the society in general. Gross (1964) identified four phenomena that characterize these open systems:

1. Entries and exits transform outsiders into members and members into outsiders.
2. Multiple memberships in groups result in members' loyalties to other groups.
3. Resource exchange among the groups.
4. Mutual or reciprocal influence by both members and outsiders.

Any open system interacts with its environment in mutually influential ways. Since each group is rooted in many other systems, groups influence these larger environments

and are influenced by them. Conflicts occur when incompatible demands of multiple systems clash. A work group that refuses to operate within the general policies of the company will certainly cause problems for itself and the organization. Similarly, a company that refuses to function within the prevailing ethics or norms of its society will not survive. The values of the community and the mores of the overall culture influence both individual members and the group as a whole. Ignoring culturally conditioned attitudes dooms both the work group and the organization.

Conclusion

The essence of systems theory is interdependence. Interlocking relationships among the parts of a system form to create a structure that exists among other systems. When one part of the system changes, the effect is felt within the system and throughout other systems. A constellation of factors determines whether a group will succeed in realizing its goals, but one thing is clear. The key parts of the system, the individuals, must join together in a way that harnesses the synergy of the group. A group is a living, dynamic, open system that interacts within itself and with the environment. Family, social, political, religious, military, and professional groups share a central principle: Whatever affects one part of the system affects all its parts and many other parts of the supra-system, our world.

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