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The Structural Elements of Games

E. M. AVEDON

What are games? Are they things in the sense of artifacts? Are they behavioral models, or simulations of social situations? Are they vestiges of ancient rituals, or magical rites? It is difficult and even curious when one tries to answer the question "what are games," since it is assumed that games are many things and at the same time specific games are different from one another—but are they?

. . . but we enjoyed playing games and were punished for them by men who played games themselves. However, grown-up games are known as 'business' and even though boys' games are much the same, they are punished for them by their elders. No one pities either the boys or the men, though surely we deserved pity, for I cannot believe that a good judge would approve of the beatings I received as a boy on the ground that my games delayed my progress in studying subjects which would enable me to play a less creditable game later in life. . . .[1]

Personnel in the field of recreation have avoided answering the question and have subsequently avoided the adoption of a universal taxonomy for games, since to do so would demand a theory. Thus, many are content with the taxonomies that have appeared in the literature for the past fifty years, *i.e.*, indoor games, outdoor games; games of low organization, games of high organization; equipment games, non-equipment games; paper and pencil games, board and table games; games for girls and women, games for boys and men; children's games, adult games. All of these classifications refer to an element of a game and thus different

[1] Saint Augustine (A.D. 354–430), Confessions, Book I:10.

games are grouped together because they have one element in common. This leads one to ask: Are there certain structural elements that are common to all games, regardless of the differences in games or the purposes for which the games are used, or the culture in which they are used? Are there elements that are invariant under certain transformations? If the answer is in the affirmative, then these invariant elements would not only lend themselves to scrutiny, but would enable personnel to standardize game utilization for therapeutic purposes, as well as modify professional program planning practices.

The notion of invariant structural elements in games has been an interest of mathematicians for a number of years. Von Neumann and others have delimited a number of elements which they believe are present in all games, elements that are necessary and invariant, *i.e.*, number of players, rules of the game, results or "pay-off," and strategies that could be employed in play of the game. However, from the point of view of recreation, these elements are not sufficient to make a game. In addition, strategy is something that a player brings to the game; it is not an intrinsic part of a game. It is something that the player develops, based on his past experience, knowledge of the game, and the personality of the other players.

In addition to mathematicians, others have also been interested in the structural elements of games. A contemporary of Von Neumann's, George H. Mead, was primarily interested in the influences of various aspects of society on human growth and development. Mead taught that games were primarily a pattern or set of specific social situations which affect personality. As a by-product of his concerns, he delimited a number of structural elements of games, which he felt influenced behavior.

> The game has a logic, so that there is a definite end to be obtained; the actions of the different individuals are all related to each other with reference to that end . . . so that they further the purpose of the game itself. They are interrelated in a unitary, organic fashion. . . .[2]

Thus, one element—the logic of the game, the definite end—may be thought of as the *purpose* or raison d'etre. A second element would be the actions in reference to the purpose, or the *procedures for action.* A third element would be the interrelated actions. Mead indicates that games include social processes which influence or regulate interaction of the players, and thus this third element might be termed *interaction patterns.*

[2] George H. Mead, "Play, the Game, and the Generalized Other" *Mind, Self, and Society,* Chicago: University of Chicago Press, 1934, pp. 158–159.

A fourth element Mead specifies is that of the *roles* which games require players to take. The fifth element he identified is the only one which Von Neumann also identified, *i.e., rules governing action.*

Szasz[3] built directly upon Mead's theories. Although applied within a psychiatric frame of reference, he too indicates that games may be viewed as objects affecting personality. He strengthens Mead's delimination of game elements and stresses the factor of interaction patterns. In analyzing the structure of games, he delimits such elements as rules, roles, procedures, etc.

Goffman,[4] contemporary of Szasz, in studying the sociology of interaction also strengthens Mead's delimitation of game elements. Goffman reports on different types of "focused interactions" and stresses the same game elements as others before him. However, Goffman introduces a new element, which he refers to as *fun* or euphoria. He indicates that this element must be present to ensure participation, and that players modify and manipulate various other elements in order to find *fun* in a game. Fun, like strategies, is subjective and is therefore not an intrinsic element in games. As Goffman rightly points out, often the other elements must be manipulated for a participant to have fun.

In addition to the elements Mead identifies, Goffman emphasizes some of the elements Von Neumann and his colleagues have identified. Unlike Szasz, Goffman's concerns are not with the game as a mode of behavior, but the game as a milieu for behavior.

Recently another psychiatrist, Eric Berne, published an exposition on behavior and games.[5] Berne concerned with interaction, uses the term "transaction," while Goffman uses the term "encounters." They both discuss a variety of interaction patterns subsumed under these labels, and indicate that games are only one type of interaction. Berne emphasizes the same elements as Mead, Szasz, and Goffman; however, he uses different labels. A striking aspect of Berne's approach is his identification of seemingly non-game interactions as games. He points out that games are differentiated from other types of interaction because of their intrinsic elements, and many social situations, although appearing not to be games, possess these elements, and are in reality, games, a notion similar to the one expressed by Saint Augustine. He also indicates that some playing is with conscious intent, and some is the result of unconscious

[3] Thomas S. Szasz, "Game Model Analysis of Behavior," Part V. *The Myth of Mental Illness*, New York: 889-7500 Medical Division, Harper and Row Publishers, 1961, pp. 223-293.

[4] Erving Goffman, "Fun in Games," *Encounters*, Indianapolis: Bobbs-Merrill Company, Inc., 1961, pp. 17-81.

[5] Eric Berne, *Games People Play*, New York: Grove Press, 1964.

conflict. Szasz and Berne identify certain qualities in games which have pathological significance.

By combining the work of the mathematicians and the behaviorists, we are able to identify seven elements in games. These are:

1. Purpose or raison d'être.
2. Procedures for action.
3. Rules governing action.
4. Number of required players.
5. Roles of participant.
6. Participant interaction patterns.
7. Results or pay-off.

In addition to these, personnel in the field of recreation have called attention to additional game elements which must be considered. A major element which recreation personnel have long been concerned with are the *abilities and skills required for participation.* Other elements which recreation personnel consider to be of importance are the *environmental requirements* and necessary *physical setting,* and the required *equipment* needed for participation in a game.

From a syntactical point of view then, games are composed of ten elements; possibly, additional elements will be identified at some future date. Presently, the ten elements to consider are as follows:

Element	Example
1. *Purpose of the game;* aim or goal, intent, the raison d'etre.	Checkmate one's opponent (chess). Bid and make a contract (bridge). Complete the course in as few strokes as possible (golf).
2. *Procedure for action;* specific operations, required courses of action, method of play.	Roll dice, move counter in clockwise direction around board, the number of spaces indicated on dice. Act in manner indicated by last space on which counter lands, *i.e.,* take a chance, pay rent, go to jail, etc. (Monopoly). Stand in box, toss two successive shoes at far stake, travel to that stake with opponent, tally score, pitch back to first stake (horseshoes).
3. *Rules governing action;* fixed principles that determine conduct and standards for behavior.	Go back where you were, you didn't say, "May I?" (Giant Steps)

Element	Example
N.B. Some games have very few rules, others have such elaborate sets of rules as to require a non-participant to keep track of infringement of the rules or to enforce the rules.	Regulations regarding weight and types of blows which may be employed. Panel of judges and referee determine infringement of rules, and have responsibility for enforcing rules (boxing).
4. *Number of required participants;* stated minimum or maximum number of persons needed for action to take place.	Minimum of two required, no stated maximum (hide-and-go-seek).
	Eleven men required for each team, minimum and maximum of twenty-two (football).
N.B. Sometimes minimum and maximum are identical.	
5. *Roles of participants;* indicated functions and status.	Goalkeeper, center, others. Each player has a different role (hockey).
N.B. Role and power function may differ for each participant or may be the same.	Each player has no more or less power than the others, and each functions in the same way (backgammon).
6. *Results or pay-off;* values assigned to the outcome of the action.	Money (black-jack). A kiss (spin-the-bottle). A gold medal (relay race).
7. *Abilities and skills required for action;* aspects of the three behavioral domains utilized in a given activity.	
(a) Cognitive domain includes—figural, symbolic, semantic, and behavioral informational content; and operational processes, such as cognition, memory, divergent and convergent production, and evaluation.	Remembering which cards have been played and from which suits, in order to play the best card (hearts).
(b) Sensory-motor domain includes—bodily movement, manipulative motor skills, coordination, sequences and patterns of movement, endurance factors, sight, hearing, etc.	Grasping the ball, walking to the foul line, releasing the ball, etc (bowling).

Element	Example
(c) Affective domain includes—semiotic factors which stimulate emotions, *i.e.*, anger, joy, affection, disgust, hate, etc. Offers opportunities for object-ties, transference, identification.	Having one's disc knocked off the court (extension of self) requires affective control to continue game (shuffleboard).
8. *Interaction patterns:*	
(a) Intra-individual—action taking place within the mind of a person or action involving the mind and a part of the body, but requiring no contact with another person or external object.	Pillow puzzles. Finger-flexion tricks.
(b) Extra-individual—action directed by a person toward an object in the environment, requiring no contact with another person.	Jigsaw puzzle. Solitaire.
(c) Aggregate—action directed by a person toward an object in the environment while in the company of other persons who are also directing action toward objects in the environment. Action is not directed toward each other, no inter-action between participants is required or necessary.	Bingo. Roulette.
(d) Inter-individual—action of a competitive nature directed by one person toward another.	Checkers. Tennis.
(e) Unilateral—action of a competitive nature among three or more persons, one of whom is an antagonist or "it." Interaction is in simultaneous competitive dyadic relationships.	Tag. Dodge ball.

Element	Example
(f) Multi-lateral—action of a competitive nature among three or more persons, no one person is an antagonist.	Scrabble. Poker.
(g) Intra-group—action of a co-operative nature by two or more persons intent upon reaching a mutual goal. Action requires positive verbal and non-verbal interaction.	Cat's cradle. Maori sticks.
(h) Inter-group—action of a competitive nature between two or more intra-groups.	Soccer. Basketball.
9. *Physical setting and environmental requirements:*	
(a) Physical setting—man-made or natural facility in which action takes places.	Four-walled court (squash). No special setting (charades).
(b) Environmental requirements —natural circumstances which are indispensable or obligatory.	Pool (water polo).
N.B. This element may not always be present.	No special environment (dominoes).
10. *Required equipment;* man-made or natural artifacts employed in the course of action.	Rackets, bird, net (badminton).
N.B. This element may not always be present.	No equipment necessary (20 questions).

A variety of interesting questions are presented when one examines this list of elements—questions that demand rigorous scholarly inquiry. The most important question to consider is the notion that these elements are present in all games. Subsequent questions might be asked about each of the elements. For example, can the interaction patterns be viewed in a developmental hierarchy? Does one pattern have to be mastered before a participant can function effectively in another pattern, or are the patterns mutually exclusive? Using Guilford's model for *The Structure of Intellect*, can one delimit cognitive process in the same way that we are

able to delimit sensory-motor process in a game?[6] Are there other, more effective theoretical models regarding cognition which would lend themselves to this purpose. What of the affective domain—is a psychoanalytic frame of reference the most effective one to use in delimiting ability and skill in this area? Are setting and environment one interrelated element, or are they really two elements? Are there more than eight interaction patterns that can be identified?

Redl, Gump, and Sutton-Smith have indicated that there are a number of behavioral dimensions other than the ones cited which should be considered when examining games. Thus, this exposition must of necessity be considered a preliminary excursion into the structure of games, and until considerable effort has been spent beyond this theoretical attempt, it must remain just that. However, it is hoped that some of these thoughts will stimulate others in this direction.

[6] J. P. Guilford, "Intelligence: 1965 Model," *American Psychologist*, 21, (1), January, 1966, pp. 20–26.

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