

Interpenetration and Structural Coupling (*Interpenetration und strukturelle Kopplung*)

The concepts of interpenetration and structural coupling explain the relationship between systems that are internally determined by their own operations and structures. These systems are in each other's environment and irritate each other, without having access to each other's operations. Each system is a source of irritation for the other, and it must continuously process these irritations. Irritations are not the result of transmitting information from one system to the other: they are self-produced within the system, as systems are operationally closed [*→Autopoiesis*]. Interpenetration and structural coupling are not based on a type of system project; they simply happen on the basis of the *→system/environment* differentiation.

What is interesting in social systems theory is the interpenetration and structural coupling between *→social systems* and *→psychic systems*. Social systems are closed *→meaning-constituting* systems based on the operation of *→communication*, and do not have access to the operation of thinking in psychic systems. Psychic systems are closed meaning-constituting systems based on the operation of consciousness, and cannot be included in social systems. Communication cannot observe [*→Operation/Observation*] what happens in participants' consciousness, although consciousness is always involved in communication. Consciousness cannot control or determine communication; independently of what participants think about utterances and information, understanding is used in social systems to continue communication. Understanding is followed by utterances, for instance by expressions of doubt about the sincerity of a previous utterance or surprise at unexpected information. Uttering information does not coincide with the content or intentions produced in participants' consciousness, therefore participants' thinking does not coincide with what is produced in the network of communication. Participants have their own individual intentions to buy an object, but these intentions do

not determine either the economic value of the object or the consequences of the transaction. These are fixed in the communicative reproduction of payment that is generated when we understand that someone else is paying and how much they are paying. Researchers have their own intentions to present at a conference, but this does not decide the scientific relevance of their contributions, generated in a network of communications in which any presentation can find (or not find) connections. Summing up, social systems cannot result from individual intentions; they result only from the autopoiesis of communication.

Nevertheless, psychic systems are fundamental for the reproduction of social systems, as without consciousness communication is impossible. Psychic systems are the only source of environmental irritation for social systems, which have no direct access to physical, chemical or neurophysiological phenomena. Each external phenomenon needs to be filtered through consciousness to become the theme of communication and a source of self-irritation in social systems. Consciousness is therefore an essential environmental condition for communication. Social systems exist on the basis of the irritations that psychic systems create when they participate in communication. Psychic systems work as filters for any environmental irritation of social systems, thus allowing self-irritation of social systems.

The concept of interpenetration explains how systems within a system's environment contribute to system formation. Both social systems and psychic systems can exist only if they interpenetrate: communication is based on conscious thinking and conscious thinking is based on communication. Interpenetration allows mutual contribution to the selection of elements, communications and thoughts; however, communication and thought cannot coincide, as each of them is constituted in the autopoiesis of only one system. Although consciousness and communication cannot coincide, single selections can be produced simultaneously in both systems. Therefore, interpenetration does not mean mutual determination or fusion between the interpenetrating systems, since both psychic and social systems are operationally closed and can only create meaning internally. Interpenetration means that communication and thought are simultaneously produced in a specific event, as conscious thinking occurs at the same time as either understanding or uttering. However, communication and thoughts immediately separate as the event disappears: thinking immediately connects to other thinking, and communication immediately connects to other communication. As such, interpenetration en-

sure both the mutual condition of existence of the systems and the difference between the systems.

Through interpenetration each system makes its *→complexity* available for the operations of the other system. Psychic systems' complexity is available for the operational closure of social systems, and social systems' complexity is available for the operational closure of psychic systems. The penetrating system is co-determined by the penetrated system, which reacts to the structured complexity of the penetrating system. The penetrating system introduces disorder in the penetrated system, as its complexity is pre-structured, and the penetrated system creates order from this disorder, or order from noise [*→Constructivism*]. The co-evolution of these different types of systems is thus provided for by interpenetration. New conditions of communication stimulate changes in the participating psychic systems, and new ways of thinking stimulate changes in the social systems in which psychic systems participate. For instance, education transforms the conditions of self-irritation in psychic systems, and the development of individual expressions of need or knowledge transforms the conditions of self-irritation in social systems.

This implies that interpenetration means structural coupling. Structural coupling presupposes that the reproduction of each system is based on its own structures, and that each system can be irritated by another system structures. Continuous and specific self-irritations can trigger structural change in a system, in particular changes in the structures of reflexive *→expectations* in social systems. Structural coupling does not lead to durable structural connections between consciousness and communication; it does not produce operational coupling. Operational coupling means that specific elements are contingently shared by different systems. Structural coupling between social systems and psychic systems happens in single events, and the two types of systems immediately and continuously decouple. Structural coupling requires continuous decoupling: communications are connected to and find meaning in other communications; conscious thinking is connected to and finds meaning in other conscious thinking.

Structures of communication allow consciousness to take form. Social systems generate binary schematizations, distinguishing between two sides as forms of reduction of their internal complexity, which are thus made available for consciousness. Binary schematizations are used by both social systems and psychic systems in their operational closure. They are produced by a social system as reduced complexity and autonomously used by psychic sys-

tems, which can choose from the available options. Binary schematizations include, for instance, friendly/unfriendly, true/false, conforming/deviant, and attraction/aversion. These schematizations show that interpenetration means structural coupling, as it selects the structures that enable the reproduction of the interpenetrating systems. Binary schematizations are structural productions in social systems that are successful in providing self-irritations in psychic systems. Self-irritations arise from an internal comparison of events with the system's established structures.

Thus, structural coupling explains socialization, which is the process that forms the psychic system, as well as the bodily behavior of human beings that the psychic system can control. Socialization is based on individuals' participation in communication as experience of socially reduced complexity. This experience contributes to structuring the complexity of psychic systems. Binary schematizations are structural productions in social systems that are successful in causing self-irritations in psychic systems. Socialization means that the psychic system can use, in its self-reference, schematizations attributed to the social environment. Therefore, socialization is based both on the binary schematizations that are defined in communication, and self-socialization, which are meaningful operations produced by the psychic system. In socialization, it is the binary schematizations that are relevant, rather than the specific options that they offer: what counts is the distinction between attraction and aversion, not the choice of either attraction or aversion. Increased structured complexity in social systems changes the conditions of socialization, without denying the importance of self-socialization.

Structural coupling can also be observed between the subsystems of a functionally differentiated society [*→Differentiation of Society*]. Each functional system observes the other functional systems in its environment as relevant for its reproduction. This observation enhances interdependencies among the functional systems, which are based on structural coupling. For instance, the political system and the economic system are coupled through taxes and charges, in which both money and political power are involved; similarly, the legal system and the economic system are coupled through contracts and property, which are legally determined and economically relevant. These interdependencies are always observed from the perspective of specific functional systems, which in this way cause self-irritations. For instance, political taxation provokes self-irritations in the economic system. Any change or instability in a subsystem determines self-irritations in the others, with an ensuing intensification of irritations.

In a functionally differentiated society, structural coupling presupposes the operational closure of functional systems. However, structural coupling between functional systems is also operational coupling, because specific communications are contingently shared by different systems, although they are immediately connected to the internal autopoiesis of these systems (e.g., to the political system and the economic system or the legal system and the economic system). For instance, negotiating and signing a property contract is a communication which is contingently shared by the legal system and the economic system, and the government's reimbursement of tax is a communication which is contingently shared by the political system and the economic system. Operational coupling is possible in society because it involves the same type of operation (communication), but it is not possible between social systems and psychic systems, as communication and thought are different types of operation, ensuring the autopoiesis of different types of meaning-constituting systems.

Structural and operational coupling between functional systems show how functional differentiation determines the integration of society. This integration is necessary because the differentiation of functions also requires systematic interdependencies to reproduce society as a whole. However, the great quantity of structural and operational couplings between the subsystems exposes the functionally differentiated society to continuous and systematic self-irritations, which cannot be regulated at the level of the society itself. Therefore, in the functionally differentiated society, the combination of multiple forms of operational closure in functional systems, and the interdependencies that enhance continuous self-irritation in each functional system, create an exceptional level of complexity. [C.B.]

Interpenetration. Zum Verhältnis personaler und sozialer Systeme (1977); Interpenetration bei Parsons (1978); Social Systems (1995: Ch. 6); How Can the Mind Participate in Communication? (1994); Theory of Society (2012: Ch. 1.6); Theory of Society (2013: 4.9).

