Chapter 3
Social Systems Theory

3.1 Introduction

This chapter illustrates the basic concepts of Luhmann's Social Systems Theory to facilitate understanding of his theory of education system. Since the beginning of his career as a sociologist (see Chap. 2), Luhmann expressed the intention to elaborate a general theory of society. As he explained in the Preface of his final book on the theory of society (Luhmann 1997:2012, pp. xi–xiv), he later decided to anticipate a book on the general theory of social systems, published in 1984 (Luhmann 1984:1995), and some books on specific subsystems of modern society (Luhmann 1988, 1990b, 1993, 2000a:2013, 2000b). The general theory of society was published, in its final version, in 1997, and translated in English in two volumes, respectively in 2012 and 2013.

According to Luhmann, a general theory of society should make it possible to understand any sociological topic. Luhmann stated that sociology is a science, rather than a philosophy, an ideology or a way of proposing values. The specificity of sociology as a science consists in studying its object (society) within its object (society). Sociology describes the society in which it is generated, and in this way it also generates itself, i.e. sociology discovers itself in its object of study (Luhmann 1997:2012: 11). In other words, sociology is both a description of society and a self-description as part of society. Therefore, the theory of society contributes to the production of the object it analyses, in particular it *changes* this object, as its production is part of it; the production of a sociological theory changes society, regardless of its effects outside sociology (e.g., political or educational effects).

Luhmann has 'imported' in sociology a great number of concepts from other disciplines, e.g. biology, mathematics, physics, cybernetics, cognitive sciences. Nevertheless, in his perspective, sociology has its own specificity as a science, and the problems (or, more precisely, the distinctions, as we shall see) guiding sociology are self-produced. Sociological theories, however, share many aspects with other scientific theories. First, they need empirical reference: Luhmann dealt with a great number of empirical problems during his career and systematically

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clarified the empirical reference of his theory of society. Theoretical abstraction and empirical analysis are closely connected. Second, they allow comparisons between different ways of identifying and solving problems. Comparison means that it is not possible to find a single, ultimate solution to sociological problems. Any attempt to find a final solution must be compared with other attempts and included in a plurality of attempts. Sociological theory is only one perspective among others and should take account of this in its analysis.

Luhman called this perspective 'functionalism' (Luhmann 1970). A function 'marks a problem (…) in such a way that multiple solutions can be compared and that the problem remains open for further selection and substitution' (Luhmann 1995a:2000, p. 138). Functionalism means identifying one problem and considering the different possible solutions that have been adopted for it. It means observing each solution as a 'functional equivalent' of other possible solutions of the same problem. Therefore, each solution is considered one among others, either actualised or possible, and 'contingent', i.e. possible in other ways. Sociology reinterprets apparently obvious solutions as improbable and as having alternatives. In their turn, different sociological theories can be compared as different ways of observing the same problems and solutions. This comparison is based on a particular theoretical perspective among others, which can thus be compared to the others. This continuous and recursive activity of comparison can lead to changing the theory.

Against this background, Luhmann's theory concerns social systems, including society, interaction and organisation.

3.2 The General Presuppositions to Understand Social Systems

3.2.1 The Distinction Between System and Environment and the Autopoiesis of Systems

The point of departure of Luhmann's theory is a *distinction*. Luhmann substitutes the analysis of 'objects' with that of distinctions, i.e. the analysis of something as distinguished from something else. This approach is based on a particular 'logic of forms', as proposed by the British logician Spencer-Brown (1969). Distinctions are based on 'directives' to draw them (Luhmann 1997:2012, p. 28): drawing distinctions means indicating a given side of a form and distinguishing it from another one, which is left undetermined ('unmarked'). The basic distinction in Luhmann's theory is between system and environment. Social phenomena are seen as social systems, indicating the system as distinguished by the (undetermined) environment.

Reconciliation or separation between the two sides of the form is impossible: a system does not exist without its distinction from an environment. There is not a 'general system' including all systems; rather, there is an undetermined world, in which each system draws a distinction from its environment. The world is observed as the unity of the difference between system and environment, and as such is undetermined and undeterminable. According to Luhmann, systems include living systems, psychic systems and social systems. Sociology deals with social systems, thus distinguishing itself from psychology and biology.

Systems only operate within themselves: they are the only side of the system-environment distinction that is determined. Therefore, systems cannot take anything from the environment. On the one hand, the environment is important, as it is a continuous source of 'irritations' for the system, which must continuously work on these irritations. For instance, living systems need chemical and physical irritations to be active, i.e. to activate defences against attacks. On the other hand, irritations are not the result of a transmission of information from the environment to the system but are self-produced in the system. The environment cannot pre-organise irritations for the system.

Systems self-produce irritations as they are operationally closed. Systems 'can distinguish themselves from the environment, but only in an operation within the system itself' (Luhmann 2012, p. 31). Through its operation, the system can create a boundary between itself and its environment. This boundary cannot be crossed: the system and its environment cannot shape each other, and the system generates all internal information and states.

Adopting (and adapting) a concept from biology (Maturana and Varela 1980), Luhmann explains the system's operational closure as based on *autopoiesis*. In biology, this concept is used to explain the basic characteristic of living systems, which can reproduce their own elements (in particular, cells) through the network of such elements and the relations established therein. Luhmann expands this concept by differentiating systems for their basic operation: cells in living system, conscious thoughts in individual psychic systems and communication in social systems.

In particular, Luhmann observes that a social system exists only if it can reproduce its operations through its operations, i.e. in the network of these operations. The autopoietic process of self-reproduction determines the operational closure of social systems. The concept of autopoiesis explains the system's *autonomy* at the operational level as self-production of its basic elements. Autonomy means that autopoiesis 'functions unconditionally' (Luhmann 1995a:2000, p. 157). The concept of autopoiesis is also used to explain the fact that there are objects in the world, and therefore in the environment, that are not systems, in that they cannot reproduce themselves at the operational level (e.g., physical objects like stones).

3.2.2 Meaning (Sinn)

Social systems and psychic systems are based on meaning (*Sinn*): they are meaning-constituted systems. Since the first version of his theory, Luhmann has drawn on philosophy, more precisely on phenomenology, to define meaning. Meaning is the observation that any content produced in the system's operations always refers to other possibilities of production, which remain in the background of what is produced. In terms of logic of forms, meaning is defined as the form of difference between actuality and potentiality: system operations are meaning-constitutive as they are based on the distinction between actual and possible; any system operation is a selection of actual content among possible alternatives, and further operations can always select (actualise) other possibilities. Any operation is thus a specific decision of making something actual, while leaving any other option possible. Meaning is made evident through the possibility to decide elsewhere. Paradoxically, meaning is the product of the operations that presuppose it, in that it can exist only in its reproduction through these operations.

Meaning can be better understood on the basis of the distinction between *medium and form*, which Luhmann borrows from psychology of perception (Heider 1926). The concept of medium indicates loosely coupled elements, 'an open-ended multiplicity of possible connections' (Luhmann 1995a:2000, p. 104). A form is constituted on the basis of a medium as a specific configuration of elements, i.e. as a tight coupling of elements. The medium does not disappear when it takes a form, it may be 'reused' at any time and it always imposes limits on the possible forms. Specific forms can be replaced; thus forms regenerate the medium by coupling and decoupling its elements. However, the loose coupling of elements allows many possible forms; therefore, forms cannot be fixed. Forms are selections in the field of a medium (Luhmann 1997:2012, p. 117).

Meaning is the universal medium of all psychic and social systems (Luhmann 1997:2012, p. 23), i.e. the medium for all forms that are generated in these systems. Meaning is a medium as it generates loose connections between actual and possible selections. It can thus allow any type of tight connection between selections in the system. Therefore, meaning is the basic medium of all forms produced in the system. It is not possible to actualise non-meaning, as the existence of non-meaning can be observed only through meaning. Any reference to non-meaning reproduces meaning; therefore, in system operations non-meaning must necessarily have a meaning. Meaning continuously generates itself as a medium of selections of particular forms in psychic and social systems. Psychic and social systems both presuppose and generate meaning in their operations: the distinction between medium and form is produced in the system, through its operations.

A meaning-constituted system (be it a psychic system or a social system) can refer to both itself and its environment, i.e. it can distinguish between *self-reference and other-reference*. Self-reference means that the system operations refer to other system operations, in particular each communication refers to other communications (e.g. the answer 'fine, thank you' refers to the question

'how are you?'). Through self-reference, the system can also refer to the environment (other-reference), as observed from the perspective of the system's operations. For instance, communication can thematise pollution as an environmental problem, or individual emotions. The system-environment distinction is not only produced by the system, it is also observed in the system (Luhmann 1997:2012, p. 19). In social systems, the system-environment distinction consists in the difference between communicating as system operation on the one hand and themes of communication concerning the environment on the other. In other terms, the system-environment distinction is generated on one side of the distinction itself (the system): there is a *re-entry* of the distinction in what it has itself distinguished. All operations are constituted in the system, regardless of the focus being on self-reference (on communication itself) or other-reference (on contents of communication). Since the distinction between self-reference and other-reference is generated in system operations, it is this distinction that establishes the boundaries of the system.

A meaning-constituted system on the one hand makes past selections available for its present operations, on the other considers its future operations as undeterminable. Each time operations refer to the past, they refer to previous operations that are available for further elaboration (it is possible to communicate on past communication). Each time operations refer to future, they refer to an infinite number of possibilities (it is possible to communicate in different and undetermined ways). In this way, the world becomes 'an immeasurable potential for surprises' (Luhmann 1997:2012, p. 19). Meaning ensures present determinations, on the basis of the past history of selections, while opening future alternative possibilities. The actual present can 'pre-orient' future possibilities, but it cannot determine them.

3.2.3 Double Contingency

Luhmann draws the concept of double contingency from Talcott Parsons' famous sociological theory (Parsons and Shils 1951). Against the background of Parsons' first elaboration of this concept, Luhmann conceives social systems as solutions of the general and primary problem of double contingency.

The problem of double contingency depends on the different positions of Ego and Alter, both Ego and Alter being positions that indicate 'open potential for meaning determination' (Luhmann 1984:1995, p. 105). Double contingency means that both Ego and Alter act contingently (i.e. in a way that cannot be predetermined) and assume that their interlocutors act contingently. In other words, double contingency concerns Ego and Alter's mutual experience of non-accessible meaning, which opens up further possibilities in any actual determination of their own actions. Double contingency implies that: (1) Ego can choose from different alternatives of action and Alter can react in different ways to this choice; (2) both Ego and Alter are therefore obliged to choose their actions taking into account

the interlocutor's action, in particular its contingency. Ego and Alter cannot get access to each other; therefore, on the one hand, they must both assume that each can determine meaning, on the other, they cannot control or forecast each other's determinations of meaning.

Mutual positioning of Ego and Alter determines a tautological symmetry that does not lead anywhere: both Ego and Alter are blocked by their observation of undeterminable contingency of each other's actions. Social systems can be generated only if this symmetry is interrupted by ensuring connectivity between Ego's and Alter's actions. This connectivity is based on communication as a specific and structured operation of social systems.

3.3 Social Systems

3.3.1 Communication as Operation of Social Systems

The specificity of social systems as autopoietic and meaning-constituted systems is that their operation is communication. They generate communication through communication, in a network of communications that is based on the medium of meaning.

Traditional sociological literature has seen action as the basic element of sociality (Parsons and Shils 1951). In these theories, actions are frequently guided by either individual motives/intentions or rational calculations. Luhmann observes that, since not all actions are admitted in society, individual intentions or aims are not sufficient to explain social systems. The alternative concept of communication stresses the fact that Ego and Alter can *both* act *and* understand. In particular, understanding is extraordinarily important in that it realises the other's utterance as well as uttered information. Communication is the unity of the difference between three selections: utterance (*Mitteilung*), information, and understanding.

Firstly, communication is always communication on something, as it always includes information. Information is a selection, in that the choice of any topic excludes other topics. Secondly, information is always uttered. Communication includes utterance, showing intentions, motives, reasons, knowledge; utterance is a selection, as it is designed in a way instead of others. Thirdly, understanding is a crucial selection to realise and differentiate utterance and information: through understanding, each communication can stress 'who has uttered what' (Luhmann 1997:2012, p. 45). Understanding makes it possible for further communication to refer to either previous utterance (who's motives, intentions) or uttered information (what), including reference to difficulties in or ways of understanding. Therefore, understanding is the selection that generates communication.

Communication can select and actualise meaning, by opening further possibilities of communication in making reference to previous information or utterance. Communication allows the reproduction of the system through the continuous production of the distinction between self-reference (reference to utterance) and

other-reference (reference to information). Communication always depends on the event of understanding; therefore, communication is an event that disappears as understanding occurs, and this allows the production of meaning and the continuous operational production of the system. Social systems exist only as a sequence of communicative events: the relation among these events is based on meaning, which allows selection of specific communications and connections among them. Double contingency is visible in participants' utterances as selections that need to be understood, i.e. in contingent events of communication which can always be produced in other ways. Through communication, double contingency is transformed in operational closure of social systems. As we shall see below, this requires the generation of social structures.

In social systems, communications can be produced only in the continuous connection with (as reaction to or stimulation of) other communication. The elements (and operations) of social systems are only communications, and this excludes both other operations (either consciousness in psychic systems or reproduction of cells in living systems) and (physical, chemical, artificial) objects.

Against this background, it is also possible to understand the importance of action. In Luhmann's theory, 'action is constituted in social systems by means of communication and attribution as a reduction of complexity, as an indispensable self-simplification of the system' (Luhmann 1984:1995, p. 137). *Attribution of action* is necessary to reproduce communication: action is not the operation of social systems but a way of making this operation visible in the system. The process of communication can be 'decomposed' in actions: each action coincides with the unity of utterance and information. This happens because only action makes it possible to observe if understanding has been achieved. In short, each action (1) shows previous understanding, i.e. achievement of communication, and (2) refers to previous utterance or information. Therefore, attribution of action provides the self-referential connection between communications, making it possible to fix the communication process as a series of observable events. As understanding is not observable as such, attribution of action is a simplification of communication that provides the possibility of self-reference within social systems.

3.3.2 Structures of Social Systems

The concept of autopoiesis is combined to the concept of self-organisation. Self-organisation means self-production of *structures*. Self-organisation is important in that it means that the system uses its operations to build its structures. Autopoiesis generates indeterminacy within the system, and the system can reduce this indeterminacy through its structures. Operational closure is the basis of organisational closure: the system needs operational closure (autopoiesis) to exist, while its internal structures, which reduce its self-created indeterminacy, can be re-used but also dismissed and changed. Autopoiesis is the only invariable aspect of systems, while structures (and self-organisation) are always variable. Structures restrict the

possibility of connecting operations, conditioning the autopoiesis of social systems. This is a necessary condition for limiting random connections between operations and ensuring the relationship between past and future operations.

Social structures give internal guidance to social systems, making their autopoietic production possible. Historical selections, which are produced through communication, are preserved in the system as the basis of autopoietic reproduction, i.e. the system's history is the basis for future selections. Social structures are 'selections schemata' (Luhmann 1997:2012, p. 50) that make repetitions possible in social systems, thus condensing their identities.

Social structures are *structures of expectations* (Luhmann 1984:1995, p. 110) that produce asymmetries in situations of double contingency. Expectations are structures that allow 'the absorption of uncertainty', enhancing connectivity in meaning-constituted social systems, and thus replacing the indeterminacy of double contingency. Social structures, therefore, consist in constructing expectations about Ego and Alter's possible contributions to communication. Ego can expect Alter's expectations; more precisely Ego can expect that Alter construct expectations about Ego's actions, and vice versa. Thus Ego and Alter can contribute to communication depending on expectations that are expected by both of them. In other words, social structures are (Ego's) expectations of (Alter's) expectations, or reflexive expectations.

The problem of double contingency can be solved through any type of reflexive expectations. All social structures are equivalent solutions of the same problem of double contingency; therefore, they are in their turn contingent and can be changed in the system according to operational necessities (necessities of communication). As we have seen, only the autopoiesis of social systems is invariable. As social structures can only be built through operations of communication, they can be changed depending on the results of these operations. Social structures are produced within society; therefore, we will further deal with them when we introduce society as a specific type of social system.

3.3.3 Interpenetration and Structural Coupling of Consciousness and Communication

Double contingency and operations of communication are generated by the impossibility for individual psychic systems to observe each other. Psychic systems are closed meaning-constituted systems, based on the operations of consciousness, which are not accessible to operations of other psychic systems in their environment. Consciousness cannot be included in social systems through communication. On the one hand, communication cannot understand what happens in participants' consciousness, although consciousness is always involved in communication. On the other hand, individual consciousness cannot control or determine communication.

In social systems, the meaning of understanding is determined in the network of communications, not in the participant's consciousness. Independently from what participants think about utterance and information, understanding is shown through further utterance, which is used to continue communication, for example by expressing doubts about the sincerity of a previous utterance or surprise for unexpected information. Therefore, utterance, information and understanding do not coincide with the content or intentions produced in participants' consciousness; they achieve their meaning only as communication. Participants' emotions or elucubrations do not coincide with the meaning of utterances in the network of communication. Participants can be moved to buy an object by their emotions, but these emotions do not determine the economic value of the object, nor the consequences of the transaction, which is fixed in the reproduction of payment as communication. Communication is generated when Ego understands that Alter is paying and how much it is paying. Researchers can be satisfied with their presentations at a conference, but this does not decide the scientific relevance of their contributions, which is generated in a network of communications in which any presentation can find (or not find) connections. In short, social systems (e.g. economy, politics, science, education, law) cannot result from either individual intentions or consent among individuals but result from the autopoiesis of communication.

Nevertheless, psychic systems are fundamental for the reproduction of communication and social systems: 'Without consciousness communication is impossible' (Luhmann 1997:2012, p. 56). This leads to the important problem of the relationship between social systems and psychic systems. Luhmann uses the two concepts of interpenetration and structural coupling to indicate the relationship between autopoietic meaning-constituted systems that are in each other's environment and irritate each other without having access to each other's operations, as they are operationally closed. *Interpenetration and structural coupling* allow the relationship between the system and its environment. Interpenetration and structural coupling are not based on some type of project, they simply happen.

The concept of interpenetration indicates that 'systems within a system's environment contribute to system formation' (Luhmann 1984:1995, p. 213). 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 does not mean mutual determination or fusion between the interpenetrating systems, as both psychic ad social systems are operationally closed and can only create meaning internally. Interpenetration means that 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. Interpenetration means mutual contribution to the selection of elements; however, it does not mean coincidence of elements, as each element is constituted in the autopoiesis of only one system. For this reason, consciousness and communication cannot coincide, although single selections can be produced

simultaneously in both systems (conscious thinking is simultaneous to either understanding or uttering).

The penetrating system (e.g. a psychic system) is co-determined by the penetrated system (e.g. a social system), which reacts to the structured complexity of the penetrating system. In fact, the penetrating system introduces disorder in the penetrated system, as its complexity is pre-structured. The penetrated system creates order from disorder, or 'order from noise', according to Von Foerster (1984). On the one hand, 'social systems come into being on the basis of the noise that psychic systems create in their attempts to communicate' (Luhmann 1984:1995, p. 214). Psychic systems work as filters of any environmental irritation for social systems. Communication requires that consciousness perceives something as relevant to utter or understand. Consciousness allows utterance and understanding and is therefore an essential environmental condition of communication. On the other hand, communication generates binary schematisations, distinguishing between two sides as forms of reduction of the complexity made available for consciousness. Binary schematisations are produced by a social system as reduced complexity and autonomously used by psychic systems, which can choose from the available options. Binary schematisations include friendly/unfriendly, true/false, confirming/deviant, attraction/aversion, and so on.

Interpenetration 'selects the structures that enable the reproduction of the interpenetrating systems' (Luhmann 1984:1995, p. 220). This means that interpenetration allows a structural coupling between psychic and social systems. Structural coupling presupposes that the reproduction of each system is based on its own structures. Through structural coupling, each system can be irritated, but irritations are always self-irritations, they are constructed as operations of the system, they arise from an internal comparison of events with the system's established structures. Continuous and specific self-irritations can trigger structural change in the system, in particular change of structures of reflexive expectations in social systems.

Communication is continuously irritated by the consciousness of those who participate in it and consciousness is continuously irritated by communication it participates in. However, meaning and connections of single operations, of communication and consciousness, are determined in the coupled and separate social and psychic systems. In this sense, structural coupling requires continuous decoupling as communications are connected to and find meaning in other communications, while conscious thinking is connected to and find meaning in other conscious thinking.

3.3.4 Social Systems as Observing Systems

Social systems are observing systems, since through communication they can attach meaning to everything. Observation means drawing a distinction and thus generating a form. It consists in drawing a distinction and marking one side of this

distinction as indication. Therefore, observing means distinguishing and indicating simultaneously, in the same operation. In social systems, communications are both operations and observations as communication always distinguishes between self-reference and other-reference, indicating either utterance or information. Communication must indicate either what is uttered (information) or how/why it is uttered.

Through observation, the system can 'open up' to the environment, where openness is based on internal operations, which does not mean that information is transmitted from the environment to the system. Openness means that it is possible to communicate on environmental aspects or problems, e.g. individual idiosyncrasies, cells or pollution, through distinctions used in the social system. Observation means selection, actualising something and opening up to other possible developments. Thus, observation reproduces the meaning-constitutive distinction between actual and possible and takes a form. Observation is the production of forms, as it is both distinction and indication. Meaning is the medium in which observation generates forms (Luhmann 1995a:2000).

In a further operation, it is always possible to cross the boundary of the distinction and change the indication, therefore changing the form. Communication can stress first masculinity and then femininity, but this always requires a new operation. If the distinction is between masculinity and femininity, it is impossible to indicate both in the same communication. Clearly, it is possible to eliminate this distinction, either communicating that there is no difference or communicating in a way that makes no distinction (e.g., ignoring the distinction in the selection of personnel in organisations). The distinction always includes the perspective of observation (e.g. the perspective of the social system that uses the distinction between masculinity and femininity). However, this perspective cannot observe itself in the distinction: the condition of observing is invisible in the observation, it is a 'blind spot'. Operations cannot observe the distinction that they use, they can only indicate one side of it. Therefore, the distinction that the system uses is a 'fact' in the perspective of the system; for example, the difference between males and females is either naturally or culturally necessary. This is a first order observation, which consists in observing facts or objects.

Each observation can however be observed from another perspective, which establishes that such an observation is not a fact but a selection. This is *second order observation*, i.e. the observation of another observation, which distinguishes and indicates an observation as observation. The second order observation deals with *the way* in which a first order observation is produced. Second order observations can be produced either by other systems or by the same systems in another operation, i.e. as self-observations. Second order observations open up possibilities of observation that are excluded in first order observations, which observe reality as it appears. They can see that any observation is an operation that generates distinctions in the medium of meaning, rather than revealing reality. However, second order observations may also have 'toxic' (Luhmann 1995a:2000) effects, as *any* observation can be deprived of authenticity; authenticity itself becomes a product of second order observation. The difference between first order

observation, i.e. the observation of 'facts' as they are, and second order observation, i.e. the observation of the ways in which 'facts' are observed, is particularly important because it highlights that 'facts' are the product of a social construction.

Second order observation itself has a blind spot, as it uses a distinction without observing its perspective in this distinction. In second order observations, a given distinction, for example the one between males and females, may be replaced by another distinction, for example the one between equality and inequality. This makes a difference in the *way* of observing, rather than in the content of the observation. The basic point in an observation is how it is produced, what distinction it uses, what form it reproduces (feminism/masculism, equality/inequality, child/adult, etc.). From another perspective, a second order observation is always a first order observation. Therefore, first-order observations can never be completely abandoned: no social system can observe what it cannot observe, as it cannot observe *that* it cannot observe. Its social structure, e.g. the expectations about male and female behaviours, or equal and unequal selections, determines its perspective of observation. In this respect, it must be stressed that changes of distinctions have radical consequences in social systems, as they are structural changes.

Sociology, as any other science, is a system based on observation. In particular, sociological theories draw basic guiding distinctions. As we have seen, Social Systems Theory draws a distinction between system and environment. Each basic distinction has important consequences for further distinctions, and ultimately for the theory and its possibility to explain social phenomena. As a theory is based on, and reproduces, distinctions, it does not deal with objects but with forms, i.e. with distinctions and indications. Social Systems Theory does not deal with systems as objects, but with the system-environment form. Sociology is a form of second order observation, in that it observes the society in which it is produced. However, it deals with its basic distinctions as facts. As Luhmann (1984:1995, p. 12) writes, 'there are systems'. This aspect of Luhmann's epistemology is named '*operational constructivism*' (Luhmann 1988b), as distinguished from 'radical constructivism' (e.g., Von Foerster 1984; Glasersfeld 1987; Schmidt 1987; Watzlavick 1981:1984), which observes knowledge as constructed in a system (usually an individual cognitive system), but fails to observe its foundations in the operational closure of systems. Operational constructivism leads to observe systems' observations, rather than facts or realities. Thus, operational constructivism substitutes the traditional difference between subjective knowledge and objective world.

Social systems that observe the unity of distinctions guiding their observations generate *paradoxes*. The question here is: what is the unity of the distinction that is used to observe? This means, for example, that one needs to observe if the distinction between true and false is true, if the distinction between right and wrong is right, or if the distinction between good and evil is good. This type of observation presupposes that the distinction is applied to the distinction. This creates a paradox, as it blocks further observations in the oscillation between the two sides of the distinction. The paradox is unfolded only by replacing it with another functioning distinction. In this perspective, each social structure, being based on a distinction, unfolds the paradox, creating an asymmetry that replaces the oscillation.

Thus, communication is normally based on distinctions that either do not create paradoxes or that hide or postpone them. Thus, judges do not question their right to distinguish between right and wrong, scientists do not doubt about the truth of truth, and moralists do not doubt about the good of good. Paradoxes, however, can stimulate the system's observation of the distinctions that it uses, highlighting blind spots and forms that condition observations.

The basic distinction of systems theory itself, i.e. the distinction between system and environment, is paradoxical, as only the system can draw it. This distinction is not a fact, but it is dealt with as a fact. Using this distinction, the system can observe its own identity as different from the environment, i.e. it can observe itself only by distinguishing itself from the environment. For instance, science calls 'empirical reality' what it constructs through its own operation, which is communication guided by a distinction between true and false.

To sum up, (1) systems observe by distinguishing and indicating, without any correspondence with the external environment; (2) the environment is only evident through the system's self-irritation, which invites the system to react, in particular if expectations are disappointed; (3) each observation is based on a paradox, which consists in the unity of the distinction; (4) knowledge means unfolding the paradox, which allows connections between the system's operations.

3.3.5 The Complexity of Social Systems

Social and psychic systems are complex systems in that they combine operational closure and the medium of meaning. Autopoiesis leads to complexity, which is a consequence of meaning, in that it depends on the difference between actual operations and non-actualised possibilities. Complexity results from the fact that meaning is open to further possibilities. This can be observed in two different dimensions.

First, complexity means that not all the elements in a system are simultaneously related to each other, but rather relations between elements increase in geometrical progression with the increasing number of elements. This condition produces an excess of possibilities of communication beyond actualised communications (elements). Second, complexity of a system is observable as simultaneity of actual and possible states. Complexity implies the necessity of selecting from possible communications in order to actualise communications, thus generating contingent states and the selective organisation of autopoiesis.

Systems' self-observations cannot reflect the complexity generated in systems' operations in the medium of meaning. Social systems must select possibilities in each operation: each communication is obliged to reduce potential complexity. The reduction of complexity allows its maintenance, rather than its elimination, as actualisations always open up further possibilities. This also means that a system is less complex than its environment, as it is in the environment that everything that is not within the system happens (for social systems: all psychic systems,

human bodies, non-human living systems, chemical and physical elements). Each event in the environment stimulates unpredictable irritations in the system, which are not necessarily compatible with the system's logic.

Social systems can be complex in various ways, as any form of complexity is a contingent organisation of the system. Social systems develop structural complexity by organising their autopoiesis in different ways. The complexity of the system can be observed in a temporal sequence: it is generated through the sequence of system's operations. The actual present (operation) of a social system is the point of differentiation between its past (the complexity that has been actualised as and in communication) and its future (what is possible in communication). The repetition of the same operation (communication) in time generates the system's structured identity. Social structures are thus shaped in time.

3.4 Society

3.4.1 Understanding Society

According to Luhmann, Social Systems Theory helps overcome three 'epistemological obstacles' to a sufficiently complex theory of society: (1) social systems consist of individual human beings and relations among them; (2) society is integrated through consent among human beings; (3) societies can be observed from the outside. Obstacles (1) and (2) are overcome using the concepts of autopoiesis of social systems and structural coupling between social systems and psychic systems. Obstacle (3) is overcome using the theory of observation as system's operation. According to Luhmann, there is also a fourth epistemological obstacle, which can be overcome at the more specific level of theory of society: societies are territorially defined entities. This obstacle can be overcome through a theory of societal differentiation.

In general terms, society is defined by Luhmann as one out of three types of social systems, the other two being interaction and organisation. These systems are different from each other in terms of the ways in which their boundaries are determined. In particular, society is defined as a specific type of social system that includes *all* communications, or, in other words, all other social systems. Society is based on communication, without any other presupposition, and there is no communication outside society. This also means that, paradoxically, society includes the other types of social systems, from which it differs for the way its boundaries are determined. Interactions and organisations presuppose society, as they presuppose the operational closure based on communication and the determination of structures of communication. As interaction and organisation are particularly important in the education system, we shall dwell on them in Chap. 5.

Boundaries of society are fixed through its operational closure. The structure of society is the form of differentiation of society. Differentiation of society has always been analysed in sociology, for example in terms of division of work or

differentiation of social classes. Luhmann is interested in the primary differentiation of the system of society, which can trigger further forms of differentiations. Society differentiates itself from its environment, in which there are not communications (*Ausdifferenzierung*), and differentiates internally in subsystems (*Differenzierung*). Internal differentiation means differentiation between its subsystems and their (even social) environments. The differentiation of society generates internal environment, i.e. it generates a re-entry of the distinction between system and environment within the system (of society).

Differentiation determines the dynamisation of society, in that it multiplies the internal structures, as structures of subsystems, and observations. This implies that societal differentiation also requires societal integration. According to Luhmann, societal integration means the reduction of the degree of freedom of subsystems, as a consequence of the delimitation of external and internal boundaries. Freedom is restricted by both cooperation and conflict between the subsystems. Integration takes place in events of communications that link different subsystems (e.g., a political decision on economic investments). Integration is continuous, but it continuously shifts to disintegration, as communications are always included in the autopoiesis of different subsystems (e.g. decisions are included in the autopoiesis of politics and investments are included in the autopoiesis of economy).

The understanding of society also requires the analysis of the communication media in which its structures take form. According to Luhmann, communication is *improbable*. Since it exists only in networks of communication, i.e. it presupposes other communications and stimulates further communication, communication must achieve connections. These connections must not be arbitrary, as arbitrary connections would interrupt the operational closure of social systems. Therefore, if the problem of double contingency must be solved and social systems must be produced, communication must become probable. The problem of communication improbability can be dealt with through communication media.

Communication media are general presuppositions for society's operational closure and its internal construction of structured complexity in specific forms. Based on meaning, which is the basic medium in social systems (Sect. 3.2.2). Society generates new media that react to the improbability of communication, making communication probable. Hence, the importance of communication media depends on the problem of improbability of connections that they solve. Firstly, language is the medium that makes understanding probable beyond mere perception, i.e. it is the basic medium to achieve communication. Secondly, dissemination media (*Verbreitungsmedien*) make participation in communication, and thus reception of information, probable beyond the limitations of participants' presence. Finally, success media make acceptance of communication probable beyond the limitations of individual motivation to accept it. Communication media shape and condition the differentiation of society.

3.4.2 Language and Dissemination Media

The constitution of society is based on the solution of the first and most immediate problem of improbability, namely understanding and thus achieving communication (see Sect. 3.3.1). Our experience seems to show that understanding is rarely improbable, as communication seems fluid and easy to understand. However, this impression depends on the function of a specific medium, i.e. *language*. Language has existed since the origins of human society and has been the basic medium for the production of communication from the beginning. Language is the fundamental communication medium that guarantees the autopoiesis of society. While it is true that there are non-verbal communications, their understanding always depend on the existence of language. Only language can ensure a fluent and effective connection between communications.

The importance of language is based on its production of a positive and a negative version of communication as a yes/no structure. On the one hand, there is always the possibility to express something in either a positive or a negative form (this *is* a book, *not* an animal). On the other hand, this structure extends the possible communication, doubling connective options of communication as either acceptance (yes) or rejection (no). This allows the generation of corrections, controversies and uncertainty, opening a space of contingency in society. Against this background, it must be stressed that according to Luhmann, in society there is no preference for consent, such preference being the result of a self-description. Rather, operational closure generates the alternatives of consent and dissent, the latter being crucial to enhance structural change.

Language, however, does not make communication probable beyond the reciprocal perception of participants. For a very long time, this has meant the necessity of participants' physical presence. Wider dissemination, involving absent participants, is made probable by other media, mainly writing, and at a later stage printing. These dissemination media desynchronise utterance and information on the one hand and understanding on the other, so that understanding can happen (much) later than utterance. On the one hand, dissemination media amplify the possibility to generate a social memory, essentially as a written or printed memory. On the other hand, they amplify the possibility of rejecting communication, reaching a much greater number of participants and overcoming the constraints of physical presence. These possibilities were produced with the invention of writing, but they were strongly amplified with printing. During the twentieth century (and, after Luhmann, at the beginning of the twenty-first century), dissemination has been increasing with electronic media, in particular television and computer. The invention of these media has made it possible to include the entire world in communication. Moreover, these media make the distinction between utterance and information not necessary and, in some conditions, not possible, because utterance is substituted by the anonymity of the medium (television and computer). These media also make systematic coordination of utterance and audience understanding

more difficult, if not impossible. In other words, these media change the significance of communication.

Dissemination media have two important effects on society: they (1) are important presuppositions for internal structural change, and (2) they transform the nature of communication as society operation. Moreover, the evolution of dissemination media creates an evolutionary trend in society, which changes from a hierarchical organisation based on direct contacts to a heterarchical organisation, in which the public opinion is important (with printing and above all television) and the authority attributed to 'experts' is undermined (with the computer and the web).

3.4.3 The Modern Society as a Functionally Differentiated Society

Differentiation of society can take different forms. The form of differentiation organises the relationship between subsystems, i.e. it organises the ways in which each subsystem can observe itself though differentiation from other subsystems. The form of differentiation also determines how the subsystems are ordered in their relationships. By defining and ordering subsystems, the form of differentiation is the general structure of society that guides the autopoiesis of communication. Different forms of differentiation can be simultaneously present in society, but there is always a *primary form* that determines the structural constraints for the others.

Apart from primal societies, which were based on simple distinctions like age and gender, society can be observed on the basis of its form of differentiation. The form of differentiation can be observed starting from the distinction between similarity and dissimilarity between the subsystems. The first form of differentiation, in order of appearance in the history of humanity, is based on similarity between the subsystems. This is a segmentary differentiation distinguished on the basis of either descent (subsystems as tribes or clans) or residential communities (subsystems as households or villages). The subsystems of this segmentary society correspond to those that are generally known as prehistoric communities. All segments (or communities) are structured in a similar way.

The second form of differentiation, based on the invention of writing and the accumulation of goods in certain segments, is the differentiation between centre and periphery. This form introduces dissimilarity between a more powerful centre (where eminent families or clans live) and a residual periphery. Examples include ancient cities (e.g. the Greek *polis*) and empires that self-described as the centre of the world (Persia, Rome). The third form is stratificatory differentiation, which develops the distinction between dissimilar subsystems. Here dissimilarity means hierarchy between smaller nobility, evolving in the powerful centre, and much larger commons. Hierarchy is based on difference in rank and wealth between

households. In particular, this has been the dominant form of society in Europe in the late Middle Ages and early modernity.

In Europe, stratificatory differentiation started to decline since the invention of printing and it was later substituted by a new primary form of differentiation, combining similarity with dissimilarity between subsystems. Luhmann describes this form as functional differentiation, which coincides with the so-called modern society, surviving as primary form of differentiation until the present time.

The functionally differentiated society developed from and against stratification, rejecting rank and hierarchy between subsystems as constitutive form. This society did not develop everywhere in the same way and at the same time; therefore, it is difficult to date its beginning. The birth of sovereign states, money economy, intimate nuclear families, scientific evidence, and other structures indicates the rising of the new form of differentiation. According to Luhmann, in the last third of the eighteenth century the passage to a functionally differentiated society was completed.

Functional differentiation means that each subsystem of society fulfils a particular function in society. Subsystems are defined as functional (sub)systems, as they are differentiated and observe society on the basis of this function. Each function refers to a particular problem of society, rather than to the self-reference or self-preservation of the specific subsystem that fulfils it. Besides the system of education, which will be the object of the next chapters, Luhmann has described, in a more or less systematic way, a number of functional systems, including the legal system (1993), the system of science (1990), the system of economy (1988), the political system (2000b), the system of mass media (1996:2000), the system of art (1995a:2000), the system of religion (2000a:2013), and, in a somewhat less developed way, families and intimate relations (1990c, pp. 189–209), and the healthcare system (1990c, pp. 176–188).

Each functional system is operationally closed, therefore being autonomous in fulfilling its function and having its own structures. For instance, the political system fulfils the function of making decisions that are binding for the overall society; the legal system fulfils the function to stabilise and generalise norms in society; families as a system of intimate communication fulfil the function to include individuals as persons; the system of science fulfils the function of achieving affordable knowledge; economy fulfils the function of providing future supply under conditions of scarcity. Each functional system differs from its environment (and in particular from the other functional systems) for its function, and each organises internal communication on the basis of this function. The most important communication in society is produced on the basis of these functions. All systems are similar inasmuch as they fulfil a function, but they are dissimilar in that their functions, and therefore their internal structures and ways of observing, are different.

Each system observes the primacy of its function, but in the perspective of the comprehensive society all functional systems are equally important, and the relationship between the functions is not regulated hierarchically. The functionally differentiated society has neither apex, nor centre, and cannot regulate the

relationships between its subsystems. It enjoys great stability, as the fulfilment of many functions makes it possible to deal with many problems and in different ways, but, given the great quantity of structural and operational couplings between the subsystems, it is also largely exposed to self-irritations, which the comprehensive system cannot regulate.

In the functionally differentiated society, each environmental problem is dealt with in different subsystems, without possible centralised solutions. This creates advantages, as possible solutions multiply, and disadvantages, as each proposed solution is insufficient as observed in only one perspective among the others. Indeterminacy (e.g. in prices, consent for government, intimate relations, legal procedures, etc.) greatly amplifies in a functionally differentiated society, as central coordination is not possible.

Each functional system observes the other systems in its environment. This way of observing takes the form of *performances* for the other functional systems. For example, the political system makes decisions supporting economy, economy finances science, science provides research supporting the care of illness. These performances create mutual interdependencies among the functional systems, integrating them in society. However, all these interdependencies are only observed from the perspectives of specific functional systems, which in this way provide self-irritations. Moreover, any change or instability in one subsystem determines self-irritations in the others, with an ensuing intensification of irritations.

These interdependencies, which indicate the integration of society, are based on structural coupling. For example, politics and economy are coupled through taxes and charges, in which both money and political power are involved; similarly, law and economy are coupled through contracts and property, which are legally determined but also economically relevant. Structural coupling does not eliminate the operational closure of functional systems, rather it presupposes it. However, structural coupling between functional systems is also operational coupling, as specific communications are contingently shared by different systems, although they are immediately connected to the internal autopoiesis of these systems (e.g. to politics and economy or law and economy).

Functional differentiation determines other forms of differentiations. In particular, role differentiation as role complementarity included in functional systems, such as ruler/ruled, producer/consumer, doctor/patient, and teacher/pupil. Such differentiation is primarily based on performances and utility. Individuals cannot be described as members of subsystems, in that they cannot belong to any specific functional system; rather, they need to have access to communication in all of them. Therefore, individuals, who have lost a given position in communities or strata, can decide their degree of involvement in specific roles.

Segmentary and stratificatory forms of differentiation do not disappear in the functionally differentiated society; they can instead be reproduced, for example as segmentary differentiation of states in the political system or markets in economy, and as hierarchy of wealth based on economy. However, these forms of differentiation are always dependent on the primary form of functional differentiation.

The segmentary differentiation of the political system determines the regional differentiation of the functionally differentiated society. According to Luhmann, this form of society cannot be identified in terms of political systems or regional territories, as it includes all communications in the world. Functional systems operate without regional boundaries. The world dimension of connections and problems is increasing historically, in particular through organisations that operate worldwide (e.g., economic organisations, universities). Regional differentiation in the world society is an effect of functional differentiation, particularly of the segmentary system of states, and its importance is amplified by the unequal distribution of functional differentiation. Hence, regional differences can be understood as 'differences in the involvement in and reaction to the dominant structures of the world system of society' (Luhmann 1997:2012, p. 96). The impacts of functional differentiation 'combine, reinforce, and inhibit one another due to conditions that occur only regionally, and consequently generate widely differing patterns' (Luhmann 1997:2013, p. 128). Differences among regions, and the possibility to compare them, depend on the world dimension of the functionally differentiated society. The world society generates both the interest in cultural diversity and the interest in common development, as observing the future within society means observing the necessity of dealing with common problems.

In the functionally differentiated society, however, generalised consent is illusory, as problems are continuously generated in communication. A secure future for society is impossible and uncertainty is endemic. This situation determines the observation of *risks* (Luhmann 1991b:1993), which is generated with the functionally differentiated society. In this society, future becomes an uncertain and undetermined horizon. Each present decision has future consequences that cannot be determined in the present, and it is always possible that present action generates damages in the future. This implies that each decision is risky for decision-makers, who are attributed responsibility for future damages. This is a generalised condition in functionally differentiated society concerning ecological problems, financial investments, political decisions, love affairs, scientific research, and so on. What is risk for decision-makers can be danger for those who should accept decisions, and this can lead to protests and conflicts, as future damages depending on others' decisions may not be accepted. For example, decisions about ways of disposing of waste can be risky for decision-makers and dangerous for those who live where disposal has been decided; people observing dangers can attribute the responsibility of these dangers to decision-makers. In these conditions, the functionally differentiated society cannot find help in any form of rationality; it is characterised by the necessity *and* impossibility of societal rationality.

3.4.4 Coding and Programming in Functional Systems

In the functionally differentiated society, the autopoiesis of each subsystem is formed through a binary code. This code is the 'basal structure' of a functional

system (Luhmann 1995a:2000, p. 185), which assures the system's self-organisation and therefore structured complexity. Functional systems produce and continuously reproduce their binary codes through their operations. The binary code includes two values, excluding third orientations and any other interference in the system. The binary code is a preference code, in that it fixes a distinction between a positive and a negative value, thus defining a preference for the positive value that can be used in the system. The binary code is thus the basic distinction between a positive value and a negative value (e.g., true/false in science, beloved/unloved in families, property/lack of property in economy, right/wrong in the legal system, and so forth), to which the system orients its own operations (communications).

The binary code guides the production of communication and its operational closure in social systems, defining on the one hand the positive orientation of communicative events (true, beloved, propertied, right), and on the other hand what needs to be avoided, i.e. the negative orientation (false, unloved, propertyless, wrong). Therefore, the code selects communications that can be included in the system, distinguishing the system from its environment. The positive value concerns the system's preferred option, legitimising the distinction itself and thus becoming the symbol of the unity of the code (the code self-places in its positive value). The negative value makes it possible to reflect on the need to change orientation, symbolising the contingency of the connections between communications, i.e. the fact that these connections can be different.

Binary codes are specific forms in that they facilitate crossing the boundary between the two sides, i.e. switching from a given value to the opposite one. This facilitation of crossing is called technicisation. One way to reach technicisation is to establish a secondary coding (*Zweitcode*). This means that a code is applied to another code. We shall see some examples in the next section, where we deal with the coding of success media.

The binary code is invariant in the system. It requires, however, criteria determining the conditions for the attribution of positive and negative values. These criteria are called *programmes*. While codes are fixed and invariant, programmes change, they are variable conditions of attribution of the values. For example, theories and methods are programmes that allow the attribution of true and false in the system of science, investments are programmes that allow the attribution of money and lack of money in the system of economy. Programmes also allow consideration of other codes; for example, scientific research (attribution of truth) can be based on investments (attribution of money).

Each code does not tolerate intrusions of other codes in the coded system. Economic communication cannot be oriented by power, and political communication cannot be oriented by money. Each code is a rejection value for the other codes. In this way, all codes of all functional systems are simultaneously important in the comprehensive society. Truth, power, right, love, and so on are equally important in society, although each of them is important only in one system.

3.4.5 Success (or Symbolically Generalised) Media

The binary code may be the structure of symbolically generalised media. These are success media that have the function of making acceptance of communication probable. They create expectations of acceptance when rejection is probable, although they cannot safeguard expectations from disappointment. Their function concerns the distinction between understanding and acceptance. Understanding is the basis of the distinction between acceptance and rejection. This distinction can be evident after communication has been understood. In further communication, 'communication transforms the difference between information *and* utterance into the difference between acceptance *or* rejection of the utterance' (Luhmann 1984:1995, p. 149). Acceptance seems the 'normal' condition in communication processes, e.g. acceptance of scientific truth, political decisions, loving actions, or payments. In fact, rejection is always possible and it would be probable in the absence of symbolically generalised media.

The importance of symbolically generalised media depends on dissemination media, mainly printing. When dissemination is wide, increasing information enhances problems of acceptance. In these conditions, the participants' shared experience and memory, and the interactional pressure towards consent, cannot make acceptance probable. Therefore, the problem of accepting communication and the forms it produces becomes relevant in society.

Rejection of communication is probable when participants do not know each other (why should one accept proposals from an unknown person?), information is not immediately plausible (why should one accept knowledge that is not based on personal experience?), and attribution of selections is problematic (what is the reason for paying taxes?). In these cases, participants' motivation to accept others' selections is improbable. Symbolically generalised media make this motivation probable by creating a highly improbable combination between selection and motivation.

Luhmann suggests that the symbolically generalised media are the following: power (supported by right), truth, property (supported by money), love, art, and, with some doubts, values. All these media are connected to the rise of the functionally differentiated society. On the one hand, these media have enhanced the new form of differentiation of society; on the other, this differentiation has allowed their stabilisation as social structures in functional systems. These are 'media' in that they constitute a loosely coupled substratum enabling forms. They coordinate selections that are initially loose, producing a tight coupling between them, such as scientific theories, proofs of love, prices, and so on. The particularity of these forms is symbolic generalisation. They are symbolic as they bridge a difference between selections, i.e. they make Ego's acceptance of Alter's selection probable. This means that selection does not presuppose previous motivation: Ego accepts to pay a fine to Alter because s/he can attribute to Alter the power of imposing the fine; Ego accepts Alter's statement that bosons exist as Alter can demonstrate a scientific truth; Ego accepts Alter's invitation to spend a night together as s/he

loves Alter. To sum up, Ego is motivated to accept Alter's selection as this selection is a manifestation of a symbolically generalised medium. Motivation and acceptance are not based on particular states of consciousness; rather, they indicate that a medium makes the reproduction of communication unproblematic. The conditions of the proposed selection (e.g. truth, power, love) are established as a motivational factor. These media generalise this probability of acceptance, covering a wide range of situations.

The different symbolically generalised media are functionally equivalent in connecting selection and motivation. Their differentiation is based on the attribution of responsibility for selections as either internal or external, i.e., to either utterance (action) or information (experience of the environment). An act of power, for example, is always attributed to the holder of power (as his/her action), i.e. internally; scientific knowledge, on the contrary, is always attributed to reality, i.e. externally as experience, rather than to the arbitrary will of the scientist. This differentiation creates an 'attribution constellation' (Luhmann 1997:2012, p. 202), in which actions and experiences are differently coupled. Each of these constellations refers to a specific problem. Luhmann identifies four attribution constellations concerning the symbolically generalised media. Some constellations refer to different problems; therefore, reference problems are more numerous than constellations. For example, the constellation combining Alter's action and Ego's action indicates that Alter's action conditions Ego's action. The corresponding medium is power. Here, the reference problem is the improbability that Alter's decisions will affect Ego's actions and that Ego will be required to obey. Another example is the constellation combining Alter's experience and Ego's experience. This constellation indicates that Alter's experience conditions Ego's experience, so that the selection of information is attributed to the environment of both participants. The corresponding media are truth and values. The reference problem for truth is that Ego accepts Alter's experience of new knowledge as the basis of his/her experience of knowledge. The reference problem for values is the improbability of a common ground for participants' experience. While truth is introduced in communication through assertions, values are introduced through indisputable suppositions.

The most important structures of symbolically generalised media is a central code, which gives the media a fixed guidance function for operational closure, and the corresponding programmes for its variable conditioning. The crossing between the values of the code is achieved through technicisation. Technicisation of some media is based on secondary coding, which can support motivation. For example, law (right/wrong) is the secondary coding of power, and conditions the shift between superior and inferior positions. Power can be more easily generalised if it is based on the secondary coding of law. In this case, the positive value is duplicated as lawful power. In other cases, technicisation is not necessary, in that the facilitation of crossing between values is based on either object (art) or person (love).

Not all functional systems are structured on the basis of a symbolically generalised medium. Coding can be sufficient for structuring a functional system without

having the function of combining selections and motivation, i.e. of making acceptance probable, particularly when functional systems are specialised in changing the environment, i.e. consciousness (education), bodies (healthcare), extra-mundane meaning (religion), information about the world (mass media). In all these cases, improbability of acceptance is not a real problem, as the function of the social system does not concern the reproduction of communication. We shall see the specific case of education in Chap. 5.

3.4.6 Semantics, Self-description and Reflection

In society, observations, in particular self-observations, can take the form of *semantics*. Semantics is the set of oral and written texts that can be repeatedly used, established and stabilised as guidelines to coordinate observations in society. Semantics is produced through communication and preserved to orient further communication. It is the set of forms that can be used to select information in the medium of meaning, preserving the themes that can be potentially included in communication. Semantics connects communications by making reference to the meaning that is preserved in texts. This enables both the re-use of existing observations and the opening up of new possibilities of observing, which can connect to existing observations. Semantics can thus generalise meaning, generating distinctions that orient operations of observation. On the one hand, semantics orients communication, therefore influencing the level of societal complexity, which may require new structures. On the other, it is influenced by structural change and societal complexity, as new connections between communications lead to the introduction of new themes and the production of new texts.

Luhmann identifies two levels of production of semantics in society. The first level includes all texts and themes. The second level is a selection of the first level, i.e. it is a refined (*gepflegt*) semantics, which is preserved and reproduced for self-descriptions. Self-description is a particular type of self-observation that is operationally produced as a description of the system within the system. It is a simplified construction of the unity of the system that makes it possible to communicate in the system about the system (Luhmann 1997:2013, Chap. 5). It is a 'retrospective operation' (Luhmann 1995a:2000, p. 244) that requires the existence of something to describe; in particular, it requires the construction of memory within the system. Self-description is selective, in that it is not possible to describe everything as identity of the system. Moreover, self-description is contingent, as it is dynamic, i.e. it can change in time. Self-descriptions change the systems in which they are produced as they are part of this system.

Self-description is produced in communication, in particular in oral narratives, written or printed texts. It can be produced in all forms of society simply based on language. However, dissemination media, as well as the difference between forms of societal differentiation, have a relevant influence on self-descriptions.

Functional differentiation of society has triggered new, more articulated, more differentiated and contingent forms of self-description.

In the functionally differentiated society, semantics and, in particular, self-descriptions are produced in functional systems. Each functional system can both produce self-descriptions concerning society (e.g., sociology) and stabilise its own self-descriptions (e.g. the political system can describe itself as State). Self-descriptions require *reflection* in the system, i.e. re-entry of the distinction between system and environment into the system. Reflection is a particular self-referential form of a social system (Luhmann 1984:1995): the system indicates itself as distinguished from its environment; therefore, the environment is described as different from the system within the system. Reflection is a specific and demanding form of self-description. Theories of reflection develop conceptualisations about reflection. In the functionally differentiated society, centralised reflection is not possible, as reflection can be realised only in functional systems. Therefore, in this society, it is possible to observe a plurality of reflections and theories of reflections (Ibid., pp. 455–456).

Luhmann connects this analysis of semantics and self-descriptions with the concept of *culture*. He describes, although very briefly, two different aspects of the concept of culture. On the one hand, the concept of culture refers to the 'the supply of possible themes that is available for quick and readily understandable reception in concrete communicative processes' (Ibid., p. 163). Moreover, this concept of culture indicates that meaning can be re-used in various situations and can be enriched through this re-use, determining new 'cultural forms' (Ibid., p. 418). Culture is the condensation of the combined effects of communication media, i.e. language, dissemination media and success media (Luhmann 1997:2012). In this perspective, culture is a synonym of semantics, produced in the history of society as a set of concepts and ideas.

On the other hand, the concept of culture refers to the possibility to compare different memories and traditions, and to introduce cultural diversity within the semantics of society. This concept has been used in Europe for this purpose since the end of the eighteenth century (Luhmann 1997:2012, Sect. 3.13). In this second version, culture is seen as an obsolete concept, which does no longer find a place in an updated theory of society and should be replaced by the concept of self-description.

It seems evident that, in Luhmann's theory, it does not make sense to observe the culture of social systems or cultural dimensions of society in the usual terms of sociological analysis. The concept of culture should be replaced by the concepts of semantics and self-description.

3.4.7 The Complexity of Society

According to Luhmann, differentiation and complexity have not the same origin. Differentiation takes form from the distinction between system and environment,

while complexity from the distinction between element and relation among elements. Differentiation indicates the re-entry in society of the distinction between system and environment, while complexity indicates the excess of possibilities of communication beyond what is actualised. However, the level of complexity within society depends on the form of differentiation of society, as the multiplication of subsystems generates a multiplication of possible relations among communications. Each form of differentiation can reduce and maintain a certain level of complexity.

The development of forms of differentiation, from segmentary differentiation to functional differentiation, increases the complexity of society, making more and more communications possible. In the functionally differentiated society, the combination of multiple forms of operational closure in functional systems, and the interdependencies between functional systems, create an exceptional level of complexity through continuous self-irritation in each functional system. The functionally differentiated society increases the number of possible available options for each subsystem and increases both autonomy and interdependence of these subsystems.

Complexity does not increase only following an increase of subsystems' operations, but also and above all as a consequence of the increase of observations and corresponding selections in each subsystem. In the functionally differentiated society, there is a strong increase of second-order observations, which become relevant as self-descriptions in functional systems. Comparison of prices, public opinion conditioning politics, scientific publications, love checking, mediated communication are all opportunities for second-order observations and corresponding self-descriptions. The trend to increase concerns both structural complexity and semantic complexity. Finally, complexity increases through the development of dissemination media, such as writing, printing and electronic media, which allow an enormous number of possibilities of communication.

To sum up, dissemination media, forms of societal differentiation, self-descriptions, and level of complexity are connected in an articulated and recursive relationship. An increasing level of complexity challenges the form of societal differentiation, possibly leading to its change. Binary codes allow reduction of this complexity, providing two alternative choices. However, through this duplication of choice they also provide possible alternatives to the current selections. Therefore, although codes limit possible choices to the alternative between two values, they do not cancel the contingency of selections, which can enhance rejection of payments, political decisions, love declarations, professions of faith, information, and so on.

According to Luhmann, against the background of the complexity of the functionally differentiated society, it is possible to understand the education system as one of its subsystems with a specific function, its coupling with psychic systems, its internal structures, and its self-descriptions.