Systems, Network, and Culture

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ABSTRACT: The paper compares social systems theory and social network theory in terms of what it is they respectively seek to elucidate. Whereas systems theory focuses on problems of difference and reproduction, network theory deals with problems of identity and control, the former privileging communication and the latter action. To understand their different foci, it may help to keep in mind that systems theory is a child of computing's formative years, whereas the more recent success of network theory, despite its roots in a far older tradition, accompanies the advent of the Internet. The paper goes on to compare the two theories with respect to questions of mathematical modeling, culture, and self-reference, which interestingly are closely related. It concludes by referring to Bronislaw Malinowski's "scientific theory of culture" to propose a mathematical modeling of culture, which uses George Spencer-Brown's notion of form to combine variables of communication, consciousness, and life into one network relying on three systems capable of reproducing themselves.

ZUSAMMENFASSUNG: Der Aufsatz vergleicht die Theorien sozialer Systeme und sozialer Netzwerke im Hinblick auf ihre jeweilige Problemstellung. Die Systemtheorie konzentriert sich auf Probleme der Differenz und Reproduktion, während sich die Netzwerktheorie mit Problemen der Identität und Kontrolle beschäftigt. Erstere hat es mit Fragen der Kommunikation, letztere mit Fragen der Handlung zu tun. Um diese unterschiedlichen Akzentsetzungen zu verstehen, mag es sinnvoll sein, sich daran zu erinnern, dass die Systemtheorie ein Zeitgenosse der Erfindung des Computers ist, während die Netzwerktheorie trotz älterer Wurzeln ihren Erfolg der Einführung des Internets und damit einhergehender Phänomene verdankt. Der Aufsatz vergleicht die beiden Ansätze im Hinblick auf Fragen der mathematischen Modellierung, der Kultur und der Selbstreferenz, die interessanterweise eng miteinander zusammenhängen. Der Aufsatz schließt mit einer Erinnerung an Bronislaw Malinowskis "wissenschaftliche Theorie der Kultur" und macht einen Versuch, diese mithilfe einer Spencer-Brown-Gleichung mathematisch zu modellieren. Man erhält die Form der Unterscheidung von Kommunikation, Bewusstsein und Leben und damit das Netzwerk drei reproduktionsfähiger Systeme.

I.

Social systems and social network, together with rational choice, count among the most productive concepts of sociological theory in recent years. Indeed, they have proven so productive that one is unsure whether to keep them apart to make sure they stay productive or combine them to make them even more productive. As with all theoretical endeavors, both

ideas have their advantages, so that a mutual gain may eventuate if one theory looks at the problems the other theory is addressing. However, there is also a possible loss, as any combination of theories may end up as a quarrel over concepts, and neglect either social problems or empirical research. If theories tend to be products of "deep meditation" (White 2007, with respect to Luhmann's theory of social systems), it is all-important both to pursue that meditation as far as it goes and then to apply it beyond theorizing by linking it back to empirical research.

This paper intends to consider systems theory and network theory separately whilst seeking to understand what separates the problems they address, and subsequently to combine them if problems in social analysis, which go beyond the problems addressed so far, do appear and merit some kind of exchange between the theories. We will try to show that phenomena of culture do not correspond easily to systems theory and network theory and may possibly need investigating through a process of reformulating both of these into what we may then call a theory of form.

II.

What are the problems social systems theory and social network theory address, and how do these problems relate to the tradition of sociological theory?

I think that it is safe to say that systems theory parallels the advent of the computer and its introduction into society. Both systems theory and the computer originate in the1940's and both share an interest in knowledge and in modeling systems that are able to self-organize with respect to a complex environment and an uncertain future (Wiener 1961; von Neumann 1958; von Bertalanffy 1968; Buckley 1968). Warren McCulloch was keen to name the three problems even mathematical geniuses like Norbert Wiener and John von Neumann were not able to solve, given the statistical problem of insufficient data in time series being available for the understanding of social problems, the problem of a coupling of non-linear oscillators, and the problem of continuous nonlinear prediction (McCulloch 2004; cf. Baecker 2004a, 2007a). Yet that does not mean that the problems already addressed by cybernetics and systems theory do not concern exactly what has always occupied sociology, namely the statics and dynamics of social order as formulated by Auguste Comte (Comte 1995), or stabilization and reproduction, viz. distinction and indication, of the orientation of action in situations as conceptualized by Talcott Parsons and reformulated by Niklas Luhmann using terms introduced by George Spencer-Brown (Parsons 1951; Luhmann 1980; Spencer-Brown 1994).

In contrast to systems theory, network theory, or at least the rising interest in it, seems to accompany the appearance and introduction in the 1990s of the Internet or the World Wide Web, which is in turn supported by computers, computer grids, and computer clouds. Network theory shares with the Internet an interest in looking at and modeling combinations of strong ties, weak ties, and structural holes, which may be temporary or robust or unexpected as they cut across and re-shuffle a well-defined modern order once calculated by functional analysis (Granovetter 1973; Kelly 1990; Andersen 1998; Burt 1992; White 1992; Castells 1996; Fuchs 2001; Latour 2005). Most modeling problems seem to relate to blockmodels (White/Boorman/Breiger 1976; Boorman/White 1976; Wellman 1988), yet, as with systems theory, those very recent problems of application do not mean that network theory does not also concern what sociology has always been about, namely imitation and conflict in attempts to assess, maintain, and shift the identity and control of role and position, individual and discipline, style and switching (Tarde 1962, 1969; White 1992, 2008). Blockmodels attempt to capture a structural equivalence for sets of ties and actors within networks, so that one may understand how relations (Emirbayer 1997), including possible ones, failed network(s), and zeroblocks, prevail over actors' personal attributes.

Note that we here deliberately use the singular of "network" while using the plural of "systems". Systems are always multiple, as organic, social, mental, and artificial examples intermingle. A network seems to be something exclusively singular. It means structure, and structure means expectation (Luhmann 1995a, chap. 8). Expectations are again multiple, of course, yet they can only be substituted by other expectations. Why it is, then, that there is only one structure? There are disciplines, domains, netdoms, and, of course, there are identities, ties, and relations, and all are, within certain limits, interchangeable. However, I venture to say that there is only one network, and, as a concept, it describes how identities and control emerge, and how switchings are done.

It is evident that problems of difference and reproduction are somehow related to problems of identity and control, but just how they are related seems to be rather a mystery. Network theory's interest in structural equivalence, which directs the sociological imagination towards the self-organization of social order, certainly bears some resemblance to system theory's interest in functional equivalence. This combines the shifting of problems and solutions with self-reference, and thus combines complexity with its reduction (Luhmann 1995a, pp. 52-8). But a search for the structural certainly leads somewhere else from a search for the functional. We do not have to believe in theory, however fashionable, which considers both structure and function things belonging to an essentialist and objectivist past. We know that both structure and function "allow for variation" (Fuchs 2001, p. 15 et passim). But just how to combine the

variables and parameters of structural equivalence with those of functional equivalence, that we do not know.

III.

That is why we have to start afresh. Computers and the Internet as systems and as network are sure to stay with us, and we are still operating with a sociology dealing with difference and reproduction, identity and control. Yet, if we look at Harrison C. White's 2008 revision of his already-classical book on *Identity and Control* (White 1992, 2008), we may realize that there are three problems emerging, which do and do not seem to have aspects in common.

There is firstly the problem of mathematical modeling, which White refers back to Richard Bellman's advanced engineering theory of control because it displays a system already consisting of "nested integrations" and even allows, by distinguishing successive stages of the reproduction of the system, for some control efforts undertaken by the actors within the system (White 2008, p. 358/9). Mathematics is an option since there is almost no better way to co-present variability within just one equation or set of equations, and to make evident at a a glance that a variable is just that, an entity with some values to it, which may change according to their functional relation to some other variables. It is impossible to do this in ordinary language, all possible literary subtlety notwithstanding.

There is secondly the problem of culture, which social studies only recently began to take seriously, when all kinds of "turns", the hermeneutic, the linguistic, the interpretive, the reflexive or literary, the performative, the spatial, the postcolonial, the translational, and the iconic (Bachmann-Medick 2006), could not be overlooked anymore (Friedland/Mohr 2004). All these turns seem to relate to the cultural one, since all of them insist on some gap between a first and a second nature, a gap that lets the latter gain a rich, yet uncertain semiotic relationship to the former. Social studies relate uneasily to culture, since they look at it as a native theory of the social, which produces an awareness of distinction, contingency, and redundancy among actors that precedes, and maybe even goes beyond, sociology's efforts to describe and explain distinction, contingency, and redundancy. Social systems theory only belatedly looked into culture. It discovered a modern notion attuned to a society, which developed an interest in the comparison of historically and regionally different social life-worlds (Herder) and began to describe the function of this notion within a world society, turning to the concept of incomprehensibility (Schlegel's 1967 *Unverständlichkeit*) in order to facilitate and restrict communication across boundaries (Luhmann 1995b; Baecker 2001a, 2001b).

Culture means hegemony, but hegemony restricted to, and enacted within, interpretation and its rhetorics, as sociology is, to be sure, just one example of such an attempt at hegemony (White 2008, p. 374). Culture means an overflow of meaning, generated by switchings among netdomes (White/Godart 2007), reduced to after-the-fact interpretations of the very possibility of these switchings, interpretations which are framed most commonly as "values" in order to account for their general, yet operative character (Luhmann 1997, pp. 340-4; DiMaggio 1997). Culture means comparison, but bound up within the limits of the discovery of the incomparable – which is the gift ethnology, the cultural observation *per se*, endows its objects with while drawing them into the modern constitution of contingency. And culture means incomprehensibility, either to demand, for any understanding, some extra effort of cultural competence nevertheless (among people of different language, religion, ethnicity, gender, age, wealth, or profession), or to tell us that any further effort is futile (for we should not underestimate the polemical subtext of cultural difference).

And there is thirdly the problem of self-reference, somehow entangled with language, and somehow hoping for the possibility of envisioning grammar as an escape from paradox by giving and guaranteeing depth, that is vertical and thereby asymmetrical distinction, to context (ibid., p. xx and 368). Self-reference is also related to the question of how to deal with observations when they are done by both the social scientist and their object (ibid., p. 337), and this led the so-called postmodern movement to include, at almost any price (namely readability), the narrator among the subjects s/he is writing about. I am not sure whether the problem of self-reference is solved by White presenting himself rather as playwright than as narrator (ibid., p. 12). If the postmodern narrator has to avoid knowing better, does it help that the playwright knows about knots (πλοχη, Aristotle's 1997, 1456a, term) of beginning, climax, and ending, whilst the actors have no idea about them? Within Luhmann's endeavor to formulate a theory of social systems, the problem of self-reference is at the very center of interest. Systems are conceptualized as self-referential, self-organizing, and autopoietic, yet that does not stop readers often concluding that Luhmann is more interested in staging paradox than in avoiding it.[1]

And if all three problems have more in common than first meets the eye? What if mathematics, culture, and self-reference (both in the observer and in their subject) were rather to be combined to deal with their respective problems?

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1 In the terminology of the confidence games analyzed by Erving Goffman (1952), one may ask whether Luhmann is the first operator luring his readers into the trap of paradox or the second one cooling his readers out by telling them it all amounts to paradox anyway. Of course, some may assume Luhmann to be himself the mark (the dupe) deceived by the very idea of self-reference.

White gives a stern warning to anybody approaching the realm of general systems theory in general, and Spencer-Brown's calculus in particular: "…both of which pull one away from the main lines of science and modeling" (White 2008, p. 353), and we should take such a warning seriously; yet what if there is more to be gained than lost?

IV.

Let us start with the observer, then bring in the mathematics of self-reference, and end up with culture.

The reason for inventing the observer was epistemological. The scientific discovery of complex objects like the organism, its brain, or indeed any living cell by the biology and neurophysiology of 19th and early 20th century was tantamount to discovering that causality and statistics was overtaxed in dealing with these objects (Weaver 1948; Morin 1974). The concept of self-organization was introduced to picture both the way complex objects of any kind come about and the way a scientific observer has to organize, or "control" themself in order to be able to use their interaction with the subject as the, literally, empirical basis for any knowledge acquisition (Ashby 1958, 1981).

The observer is the one who discovers the distinction they draw as the sole basis for deriving any knowledge. As that observer is a human being endowed with a brain, a consciousness, and a memory and is, at the same time, forced to attribute the observer capability to other complex objects as well, as these come about by self-organization - be they McCulloch's pine cones, Gregory Bateson's dolphins and schizophrenics, Margaret Mead's happy sexuality among early humans or Jürgen Ruesch's nuclear families – a realization soon dawns that distinctions are drawn by observers outside the brain and the mind as well. To draw a distinction becomes a fundamental cognitive ability shared by systems in the domains of life, consciousness, and communication. And what is more, that specific human observer, who is doing his and her talking and reading in the domain of language, also discovers, Karl Marx, Friedrich Nietzsche, Sigmund Freud, and Martin Heidegger did not write for nothing (Lawson 1985), that human observers are never alone ("seeking footing with each other", White 2008, p. xviii) and not only draw distinctions but are drawn by distinctions as well, which they themselves barely have a chance to access, and then only by undertaking special reflective manoeuvers which take time and cost nerves,. In that way, even the human observer is firmly embedded within cognitive domains (Gotthard Günther 1979 proposes to add "volitive" domains) that are to be conceptualized as existing outside their minds in the social, the physical, in time, and in space, as phenomena inextricably entangled within themselves.

Yet, there is another warning in this field. As White warns about staying clear of general systems theory and Spencer-Brown's calculus, Heinz von Foerster, the master-mind of second-order cybernetics, i.e. the cybernetics of observing, and not just observed, systems, gives an equally stern warning about staying clear of complexity: if somebody is so ignorant as to approach complexity, precisely defined as the overtaxing of the observer, they rightly stay that way too (von Foerster 2002, p. 34, see also with respect to Luhmann ibid., p. 225/6). This is already Ashby's recommendation, when he says that, with complex objects, there is no need to try to "understand" them, there are only ways to "control" them – by controlling one's own distinctions in determining possible interactions with them (Ashby 1958).

We are safe in heeding this warning, since it lets us keep in mind the very complexity we should refrain from probing. And Heinz von Foerster gives us a recommendation of what to investigate instead: recursivity. The mathematics he proposes is the theory of recursive functions that became famous with chaotic, non-linear, and self-similar systems because it exhibits, despite all chaos, non-linearity, and non-triviality, one or more *eigen*-values or even *eigen*-functions, which largely resemble what we call, in ordinary life and language, an object, an idea, an institution (Von Foerster 2003; see also Kauffman 1987; Turner 1997; Abbott 2001).

If now, having learned about the observer, their cognitive abilities, and also a way to picture form within chaos, we look around for a possible concept for conceiving of culture without at once foregoing all epistemological subtlety previously gained, we may come across Bronislaw Malinowski's courageous attempt, forgotten immediately it appeared, to present us with a "scientific theory of culture". He published it at the height of World War II, and it does exactly what we would like it to do (Malinowski 1944; a reference sadly lacking in Baecker 2001). Its ambition is only matched subsequently by Talcott Parsons's theoretically much more sophisticated attempt to model the "human condition" with respect to its physical, biological, personal, and social embeddings (Parsons 1978; see Baecker 2004b), Malinowski's formula for culture addresses nothing less than the fact that the social organization of human life, action, and communication exhibits a wealth of variables, all of whose values have to be determined this or that way, so that a mechanism is needed, which guarantees the switching, shifting, and fixing activities that give all variables a new value as soon as one of them changes due to environmental change or internal events. Culture is the name Malinowski gives to this mechanism, so that it is, accordingly, at least a third-order mechanism, albeit a non-hierarchical one. Since there are activities, their organization arises according to needs, constraints, possibilities, and the mutual adaptation among the values the

variables get by being organized, all of them, their organization, and their mutual adaptation refer to each other.

Culture, with its near monopoly on understanding action through interpretation,[2] is the mechanism cognitive sciences should look for if they were eager not just to account for how the brain's single system is referenced, but for other systems for referencing, like the mental (as distinct from the brain's), the organic, and the social as well. To be engaged with culture means to reach across neatly-separated systems for referencing without denying their existence. That is why cultural critiques from Jean-Jacques Rousseau to Matthew Arnold and Theodor W. Adorno were able to ask the question on human happiness and unhappiness, which also combines mental, corporeal, and social references into envisaging a single circumstance for the world and was accordingly frowned upon by physicians, psychologists, and sociologists properly interested in distinction and analysis.

This is our idea. We propose to start the endeavor of sociological, ethnological, and possibly even cultural theory with one single form for modeling any social organization, which is (a) a distinction, (b) our, the observer's, distinction, (c) an *eigen*-form reproduced by an otherwise chaotic, non-linear, and non-trivial, or stochastic intermingling of systems governing life, consciousness, and communication, and thus (d) a self-similar structure helpful in guiding actors engaged with social action. We propose thinking of this form in terms of a symmetry of exchange between the variables it entails, and an asymmetry of order, giving it depth with respect to a distinction of context. We even venture to say that this form may show involution, differentiation, and dependency, that is style, institution, and control (White 2008, p. 355), in what is actually a rather elementary way.

Let us look at the following Spencer-Brown expression, which shows us five parameters and five indications, marked by those parameters. The parameters (and parameters there must be, see White 2000) consist in distinguishing the variables *x*, *y*, *communication*, *consciousness*, and *life* from each other, the interplay of culture then consisting in finding the values for the variables which fit the parameters in any one historical or local situation (Eq. 1):

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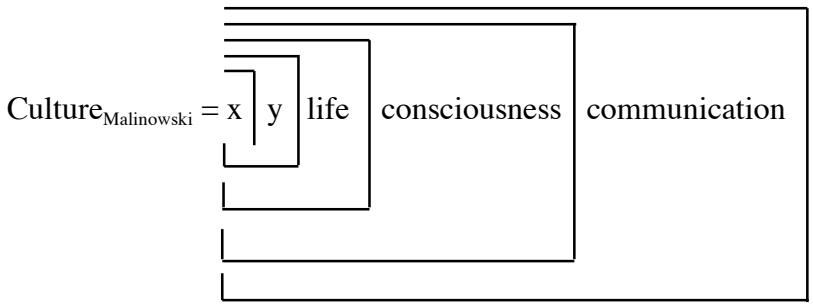
2 Artists, entrepreneurs, politicians, and more of the heroes of chapter 7 in White (2008) indeed are no exception from the rule but cultivate those of their own as soon as they can take new initiatives via a recombination of the ways hitherto accepted. Anything else is stochastic, which does not mean it should be disregarded, since it may well fuel evolution, that is selection and retention by further interpretive action.



Eq. 1

Equation 1 tells us that two variables, *x* and *y*, indicating social objects of any kind, out of a set of possible further variables are to be distinguished and contextualized within a space defined by constraints of life, consciousness, and communication. In turn, those frames are not the biological, psychological, and sociological facts – were such things to exist anyway – able to indicate which values the variables *x* and *y* should assume, but are contexts, or boundary conditions set, explored, and exploited by *x* and *y*. They refer to what systems theory is used to calling organic, mental (or psychic), and social systems. And indeed, as *x* and *y* explore their constraints they come across conditions of self-reproduction, which may be attributed to self-referential and self-referentially closed systems.

Note that the integration of three systems for referencing into one Spencer-Brown expression reveals both high degrees of determination, as all three systems for referencing demand their rights, and degrees of freedom, since, as long as the conditions of all three systems for referencing are met, culture is free to combine *x* and *y* in all ways it assumes are appropriate. That is why philosophical anthropology came up with its notion of the *plasticity* of human life (Gehlen 1988). There is an interdependence of variables, which Malinowski called a "function" in the exact mathematical sense that all variables must be considered in order to determine any of them.[3]

The equation tells us that (at least) two variables, *x* and *y*, are contextualized. The one, *x*, determines the other, *y*, and both again, i.e., their interdependence, are contextualized by an

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3 Malinowski seems to have been unaware of the two notions of "function" he is using in his text. One of them is the teleological notion, which deems that culture serves the function of fulfilling the needs of human beings in organizing their living together. And the other one is the mathematical notion that any one cultural trait is only to be determined if all others, and their evolutionary or revolutionary variants, are taken into account.

interplay of the three variables of *life*, *consciousness*, and *communication*, or of the organic, the mental, and the social. All the variables, beginning with the two first variables, *x* and *y* – e.g, a funeral ritual and a government intervention forbidding Muslim clerks to help bury non-Muslim corpses (Geertz 1973) – are spatially distinguished in depth, such that the values of *x* and *y* are horizontally interdependent within one and the same social practice, while, all the same, the value of *x*, here standing in space s_5, is vertically controlled by the value of *y*, standing in space s_4.

The two variables of *x* and *y* are contextualized by three other variables standing in the spaces s_3, *life*, s_2, *consciousness*, and s_1, *communication*. The deeper the space, the more determinations the respective variable brings with it. One may count the number of determinations by counting the number of crosses under which the variable stands.

Note, however, that this is only one way of possibly picturing the interplay. There may be other perspectives on which particular variable is standing in which particular space; there may also be perspectives that omit some variable, e.g. *consciousness*, as Harrison C. White suggested at our Berlin conference in September 2008 and indeed William James (1922) would have it (though he would not deny it a function) (Eq. 2),

$$\text{Culture}_{\text{Malinowski \& James}} = \left[\left[x \mid y\right] \mid \text{consciousness}\right] \mid \text{communication} \qquad \text{Eq. 2}$$

or omit both *life* and *consciousness*, as most of sociology would rather prefer (in that case talking, in fact, of *action* rather than of *communication*):

$$\text{Culture}_{\text{Malinowski \& Action Theory}} = x\,|\,y\,|\,\text{action}\,| \qquad \text{Eq. 3}$$

Biologists, and neuroscientists among them, may give *life* (shorthand, in this case, for the neurophysiology of the brain) the shallowest space (Eq. 4),

$$\text{Culture}_{\text{Malinowski \& Biology}} = x\,|\,y\,|\,\text{consciousness}\,|\,\text{communication}\,|\,\text{life}\,| \qquad \text{Eq. 4}$$

relegating *consciousness* and *communication* to finding out what life expects from them, all the while, nevertheless, designating life in a manner depending on how consciousness and communication think and talk about it (e.g., giving it biological preeminence with respect to consciousness and communication). Psychologists and, most notably, philosophers may instead opt for *consciousness*, sociologists for *communication* (or, indeed, *action*) to occupy the shallowest space exhibiting the least degrees of freedom.

One may also avoid such difficult choices and opt without further ado for "mind" as a catch-all phrase for life as conscious communication, as Dilthey's hermeneutics or Bateson's epistemology would have had it (Dilthey 1988; Bateson 2000) (Eq. 5):

$$\text{Culture}_{\text{Malinowski \& Dilthey}} = \left\lceil \left\lceil x \mid y \right\rceil \text{ mind} \right\rceil \qquad \text{Eq. 5}$$

Dilthey's notion of mind gave a reading almost materialistic, and at least historical, of Hegel's philosophy of mind, the dialectics of which, in their turn, went a long way to help Kant's philosophy of pure reason out of the deadlock inherent in the self-referentiality of transcendental categories. Bateson's notion thinks about mind as being the domain (or medium?) of a possible differentiation within information, learning, and evolution. Yet, if there is a point to general cognitive sciences beyond the fundamentalism imposed on them by neuroscientists, it resides in distinguishing the mind with respect to empirical systems, such as the organic, the brain, consciousness, and the social, that are subject to possible observation.

Whatever your choice of both variable and the place of it, the only knowledge-claim adhering to the Spencer-Brown expression of Malinowski's concept of culture is that there is an interdependence between the respective variables as far as determining the values of *x* and *y* goes. There is no knowledge-claim with respect to how the systems of life, consciousness, and communication may work and reproduce, or to how they actually may interfere with each other. By contrast, Malinowski's claim is as far-reaching as it is modest: the values of *x* and *y* are determined by the values of the variables of life, consciousness, and communication, but to that extent we do not know just how they are determined. The complexity of the systems involved precludes that kind of knowledge. We do our experiments, some of them deliberate, some less so. And we have our experiences, some recounted, some forgotten. But both experiments and experience go only so far.[5]

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5 This is not to disclaim any possible knowledge about life, consciousness, and society as objects of all kinds of research. Yet, when doing sociology, and even doing cultural theory, we do have to account for native theories developed by social domains in dealing with their own intricacies. Indeed, sociology, and even cultural theory, are native theories on their own - if only monitored with respect to the most general notions of society - stretching across most diverse domains. So life, consciousness, and communication appear as references employed by culture's self-understanding, which means that we have to propound a cultural theory without an understanding of *culturalia* apart from these references, in much the same way

Note that there is a space s_0, which, as the outside of the form, is unmarked and which may well invite observers to mark it by inserting intelligent design, evolution, or some entity like Gaia. This is up to the observer, who is thereby revealing both themself and their preferences and, of course, producing a new unmarked state just off the edge of the form the observer evoking.

In addition, our form ventures a hypothesis about culture whilst providing an equation indicating and distinguishing an observer, who is indeed observing in this way. There is no need to avoid the self-imbrication of the observer into the form they are advancing, since this is anyway the only way to deal with, i.e. to control, such a complex object as culture. Yet, it is absolutely necessary to be explicit about our choices. Since we are dealing with systems for referencing as being abstractions within network synthesis, we really have to monitor the scope of these abstractions in order to be able to maintain a sane perspective on that synthesis (Korzybski 1994).

Note that our Spencer-Brown expression for Malinowski's concept of culture attempts to solve old riddles about the distinction between culture and society, or between culture and social system. We reject the truce between Harvard anthropology and Harvard sociology, aimed at telling culture and society apart by saying that the latter refers to all "relational" aspects of interaction among individuals and groups, and the former to "symbols", which somehow generate meaning creatively and then transmit it from generation to generation (Parsons/Kroeber 1958). The cultural turns quoted above, most notably their performative and interpretive versions, did put an end to distinctions like the one between symbol and relation, since symbols relate, and relations symbolize. We propose instead to stick with the notion that culture indeed specifies distinct relations within society (Parsons 1973; Rehberg 1986), and that its distinction indeed stems from its references to life and consciousness, or to the corporeal and the mental (Kroeber 1952). Where these references are dealt with in such a way that the social, the mental, and the organic become once again facts of co-evolution, then not only binary, but ternary and quaternary oppositions become the focus of social research by constituting patterns of culture that combine different levels in depth (Kroeber/Kluckhohn 1963, p. 325-334).

White's and Frédéric C. Godart's remark that perceptions are generated from the process of switching from netdom to netdom, which they put forward as their introduction to a discussion of the concept of culture, then becomes all the more revealing (White/Godart

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as Heinz von Foerster demanded of any theory of communication that it not presuppose *communicabilia* to be represented by theory (von Foerster 2003, pp. 247-259).

2007, p. 3). Those netdoms are in no way restricted to purely social contexts. Netdoms, like Wittgenstein's "life forms" perhaps (Cavell 1989), encompass control efforts embedded within interactions among several domains. If "cats" are social ones (White 2008b), "nets" certainly exist among all kinds of domains capable of self-organization. That brings us back full circle to the question why we are so interested in network theory in the first place. If indeed "netdom", just like Luhmann's "communication", "presupposes the mixture of relation and topic, plus understanding" (White 2008a, p. 7),[6] we may end up with more complex units than just humans participating within both relations and understanding (Latour 1993), so that maybe it is only the topics that are truly ours.

Culture, then, becomes a notion, which describes the human involvement and engagement with the boundaries of society. Those boundaries mean network, if we follow Athanasios Karafillidis' proposition about networks not *having* boundaries but *being* them instead (Karafillidis 2009), while the notion of systems refers to recursive operations of self-organization restricted within boundaries to certain domains, the living, the mental, the social, and the artificial among them. The notion of society describes features of self-organization discovered within the domain of the social, yet there may indeed be no need to then restrict the discoveries to that exact domain (Baecker 2007b).

V.

Let me add in concluding that this simple Spencer-Brown expression for Malinowski's concept of culture already goes a long way in illustrating classical sociology's main problems, as there are problems of difference within reproduction and of identity within control. That is why form theory, if we give it that name – and if we understand by *form* a self-referential *eigen*-value of a recursive function embedded within an otherwise complex, i.e. stochastic, non-linear, and non-trivial, autopoiesis of society – may go some way to capturing the imagination and the conceptual apparatus of both social systems theory and social network theory. The *eigen*-value can only be produced and reproduced by a system. We are here dealing with a culture, which is deemed an *eigen*-form within society. Even if reproduced by the social system of society, this *eigen*-form refers further to two other kinds of self-referential systems, living systems and mental systems, while simultaneously referring to itself as the condition of its reproduction. Self-reference, here as elsewhere, is non-trivial

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6 Maren Lehmann made me aware of White's equation of netdom with communication.

since it encapsulates variation, that is non-identity, and this is the stimulus and challenge to any redundancy, that, nevertheless, has to be rebuilt for the form to be acknowledged as such.

In this perspective, we have to keep network and system apart and yet combine them in our formalism. The shifting, evasive, subversive, and indeed unavoidable interdependence of the variables' values is only to be guaranteed by a network, which produces its own synthesis, relying on structural and functional equivalences and, as it were, demanding the occasional observer firmly prejudiced in their choices and bringing their determination to that otherwise free-floating form (Kauffman 1978, p. 182).

A form theory of this kind may bring sociology into the realms of both cognitive studies and cultural studies, in that we again begin to deal with values we had learned to avoid by looking at structure instead. Values, and culture with them (Luhmann 1997, pp. 340-4, and 408-11), may well turn out to be a subject of studies in social science that combine empirical concreteness with theoretical clout. We may then be dealing with values that are determined both by those essential variables of systems reproduction W. Ross Ahby spoke about in pointing to their distribution across organism and environment (Ashby 1960) and by the parameters privileged by network theory for examining functions combining identities within their domain of control (White 2000). Yet, to do this we have to look at systems, network, and culture. The "topics" White is interested in, may turn out to be not just "catnets", but indeed "catjects" (Baecker 2007/8), if the latter act recursively like the subjects and objects this conceptual tradition cherishes, yet be topics "with impact so awesome that participants cannot bring it into focus" (White 2008a, p. 7). They constitute the *eigen*-forms we may then try to bring into sociological and cultural theory's focus.

We might also note, in concluding, that Malinowski's formula for culture – namely as a function interlinking and indeed knotting together social objects of any kind, such as x and y, on one hand, with the dynamics of life, consciousness, and communication, on the other – may go some way towards understanding of those problems of interpretation and valuation so puzzling to a sociology of culture. Value, in its singular form, may eventually come to be seen as determined by the interplay of communication, consciousness, and life. Values in their necessary plurality are the outcome and basis for an exploration and exploitation of that interplay (see also Luhmann 1997a, pp. 408/9), and interpretation is our way to fix and also to untangle its stories, disciplines, styles, and regimes. As Harrison C. White suggests, stories, disciplines, styles, and regimes may be distinguished by closures added as we move from loosely told and loosely coupled stories to disciplines adopting valuation for purposes of framing quality, purity, and prestige (White 1992, pp. 16/7), to styles syncopating complexity

into identity (White 2008, chap. 4), and eventually to regimes, and even to a hegemony, combining styles around institutions (White 1992, p. 226).

Structural sociology would eventually merge with cultural sociology, as suggested also by Stephan Fuchs (2001), because there is no structure, which does not emerge out of, and insist on, certain valuations being reproduced both within and outside their frame of interpretation. As soon as one is able to observe quality as an *eigen*-value, which is produced non-linearly and reproduced within a recursive function capturing the stochastic nature of social process, Nadel's paradox (DiMaggio 1992) is dissolved into a differentiation of the memory of the social, on one hand, from its oscillation, on the other (for "memory" and "oscillation", see Luhmann 1997b). This would bring us one step further towards the attempts by theory of both systems and of network to understand a calculus applied to trade-offs in the uncertainty marking the distinction of ambage from ambiguity (White 1992, p. 17-19).

Friedrich Nietzsche urged us to keep clear of causality and to adopt aesthetic terms to account for the differentiation of the organic, the mental, and the social, with a view just to understanding the dance each individual sphere is staging and all of them are staging together (Nietzsche 2006). As systems enact closure so that they can oscillate and memorize, and as the network synthesizes by drawing on both ambage and ambiguity, culture is the way to invest the ensuing dances with identities, which last as long as they succeed in maintaining control among themselves.

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