

# The *N*-Closure of the Observer

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<http://homepage.mac.com/baecker/papers/Nclosure.pdf>

## I.

An important argument with respect to social systems theory asks whether it necessarily is bound with two-valued, or binary, distinctions (Bühl 1969, 2000; Ort 2007: pp. 111-138; White et al. 2007). Even if social systems theory is only assuming binary distinctions to rule the reproduction of functional subsystems of society, not letting its theory architecture being dominated by binary logic (Luhmann 1999), we attempt to deal with this argument by showing a way how an observer may be modeled within a Spencer-Brown-expression as a multi-valued *eigen*-value of a recursive and non-linear function describing the reproduction of indication and distinction (Spencer Brown 1972; Kauffman 1987).

We take observation to be an operation, which reproduces an observer. The observer exhibits all features of a system since in order to observe it must be able to produce and reproduce itself within an environment. There is cognition and volition inherent in any observation, that is, when observing, the observer, in what Gotthard Günther calls a "proemial relation", orders and exchanges the indications which it uses to bring its world forth by indicating and thereby distinguishing it (Günther 1979). We here remain abstract with respect to the materiality of the observer. We certainly think of mental as well as of social, living, and artificial observers, that is we take as its possible domains consciousness, society, life, and machines. Yet, more importantly, we take observation to be a distributed, or disseminated, activity, which refers as much to an agency bringing it forth as to some environmental variables it is triggered by (Kaehr 1993).

The argument now consists in debating whether the one operation of observation should better be enfolded into a sequence of notions highlighting, in due order, the mark of an object, the self-reference of observation, the distinction being necessarily drawn with respect to a third value, and, eventually, that third value being functionally bound to an observer

reproducing itself via the operation (Bühl 2000), or else should be entangled all in one operation which paradoxically gains the identity of a unity from the drawing of a distinction. The latter is Niklas Luhmann's proposal which enables him to call for observers embedded within their social mesh who both draw that kind of distinctions and point to their inherent contingency thus re-opening any indication for a more or less playful exchange and re-ordering of possible values to be distinguished (Luhmann 1999).

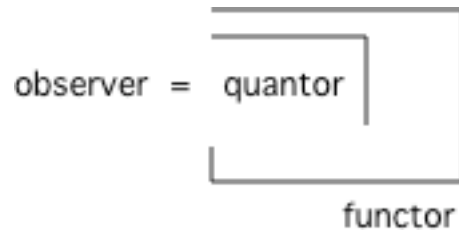
His proposal enables Luhmann to conceive of the world in terms of a Spencer Brownian form and to ask how the translation of this form into paradox brings forth the observer who is discovering its own responsibility for any enfoldment of self-reference which manages to make invisible the paradox: by pointing instead to a command, like "draw a distinction" (Spencer Brown), that engages with a construction; by pointing to a series of events, like "I don't believe in the after life, although I am bringing a change of underwear" (Woody Allen), that transforms one big contingency into a sequence of smaller ones; or by pointing to the social itself, like "your desire to imitate me is my desire to rival with you" (René Girard), that inevitably makes clear that any observation involves an observer's perspective. Thus, the world is translated into distinctions of observations, which never add to a meaning which instead is constantly in flow.

Note that there is no inherent need to restrict the social to any human domain. There have once been spirits, ghosts, and gods been around as well. There are societies of insects, as there may be some day societies of robots. And nothing precludes that an organic cell, a galactic nebula, or a computer cloud may not be considered to consist of loosely coupled units which combine via observation, that is via distinction and indication, into associations that qualify as society (Tarde 1999; Latour 2001).

We here propose to develop a more general form theory in order to reconcile Bühl's interest with Luhmann's. We inquire into the form of the observer.

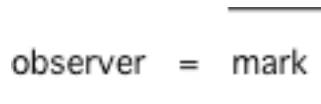
## II.

The most general idea of any form theory is to unite the two orders of operation and observation within one notion of re-entry borrowed from Spencer Brown's Laws of Form (Spencer Brown 1972). "Form" here comes to mean cross, number, and order in a way such that subversion and exchange of values become possible. We thus read Spencer Brown's form within a second-order cybernetics' view of recursive functions producing *eigen*-values that may at their turn consist of further functions concatenated within the form (Von Foerster 2003). The most general idea may read like this:

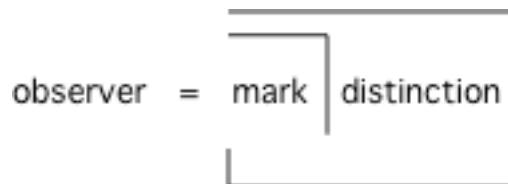


An observer drawing a distinction is thereby indicating some thing, marking it, giving it a number by comparing it to other things, and placing it within a space of observation which has a certain order, that is which may relate to further distinctions developing into a map of categories. Note that number and order are already categories, which allow an observer to observe the observer. The observer itself must not necessarily reflect on its indications in terms of distinctions, let alone of number and order. The first-order observer usually just sticks to a mark brought about by the cross(ing) of a boundary. That is why we distinguish between first-order and second-order observation.

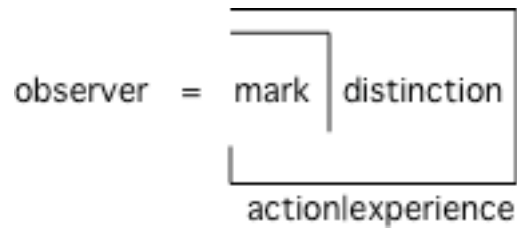
Now, in order to enfold the one operation of observation into its constituents we propose the following form. Any observer first of all has to mark something, possibly an object, but also an idea, a fugitive thought, an impression of a desire. This gives us the "image" of the distinction drawn by the observer (Spencer Brown 1972, p. 42):



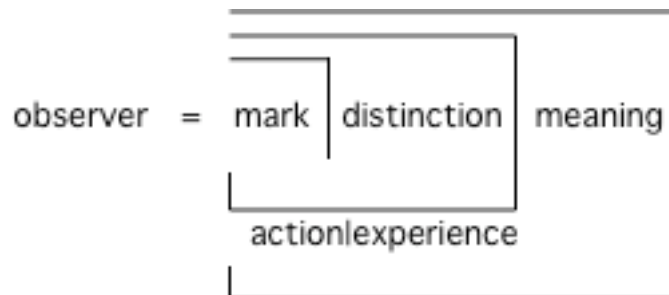
As soon as the observer, being observed, notices the form of the distinction it uses to cross a boundary and to mark its mark, it discovers the trace of a medium, which consists in an indefinite set of possible other distinctions that may be drawn as well. As the mark refers to a thing, so the discovery of the distinction as the product of a contingent operation refers to a medium of other possibilities restricted within some reality (Heider 1959):



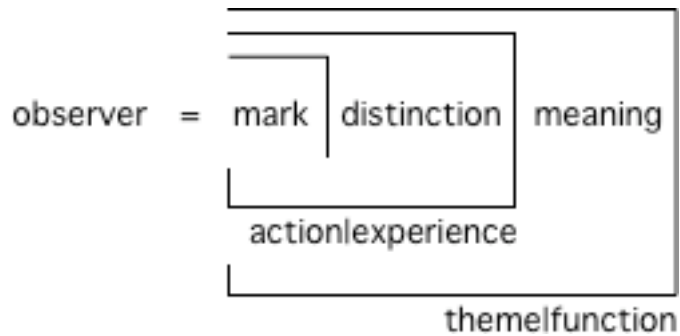
The operation of the observer here is already embedded within its own form, which means that the necessity to choose among an indefinite set of possible distinctions becomes apparent. The necessity is reflected in the observer's choice between, and attribution of, either action or experience, in Luhmann's terms (Luhmann 1995, pp. 82-86), or between cognition and volition, in Günther's terms (Günther 1979):



The discovery of the ability and necessity to choose, and to attribute the respective choice (Heider 1944), is tantamount to the discovery of a medium of meaning, of sense-making, which is in some indefinite synchrony with reality. It allows the observer to construct, and to re-construct, a reality which never quite identifies with its construction and re-construction (Luhmann 1990):

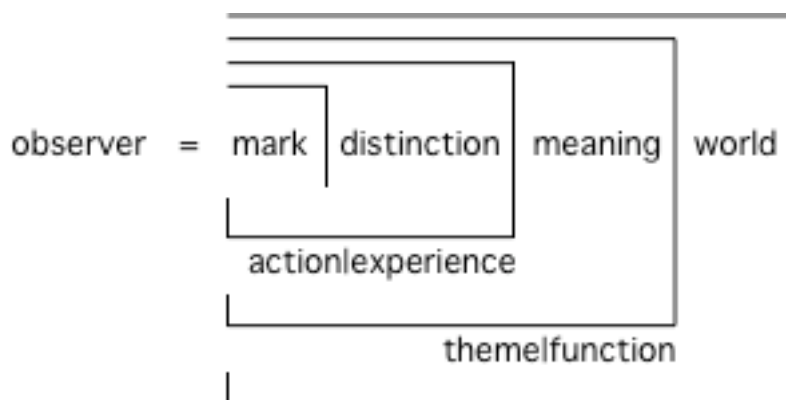


The medium of meaning, therefore, will have to be controlled by the observer with respect to a new functor that categorizes sense-making with respect to either theme or function (Luhmann 1997, pp. 77/8). As meaning not necessarily identifies with reality observers need to be able to distinguish an observation with respect to either fulfilling a function within the reproduction of the observer or to dealing with a theme that somehow is more loosely coupled to reproduction:



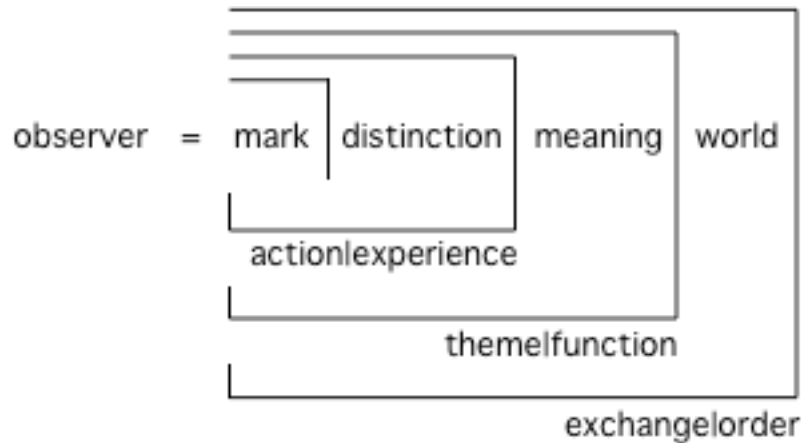
A function calls for interested observation, e.g. within a framework of critique of ideology or of psychoanalysis, whereas themes are more open with respect to both target and content ambiguity (Leifer 2002). Themes maintain a more playful relationship with meaning, exploring different possible avenues for further encounters.

As reality is inherent within all distinctions that are concatenated within the form of the observer, else it would not exist, the next, and last, context spelled out within that form is the context of the world. The distinction of the world is the distinction of some indefinite frame of, and for, the ability to choose, also called freedom. World means that the observer is free to choose, without exactly knowing where that freedom comes from, in what precisely it consists in, and what it may possibly be restricted to, let alone whether eventually it amounts to fun or burden. World is that bottom which is both dark and light, where the observer's freedom stems from without it knowing how to account for that (Schelling 1936, focusing on the dark ground):



Günther goes on to refer to that world when he looks for a distinction between positive languages able to describe a cognitive stance toward the world and negative languages able to describe a volitive stance (Günther 1980). Positive languages which accept the world, and

negative languages which reject it, both of course gaining their scope within that very world, are both necessary to enable the observer to exchange and order among each other the many values it needs to explore and exploit the world it is producing itself in. We may thus complete our form of the observer by adding a last functor relating to the proemial relationship of exchange and order (Günther 1979):



This as yet rather simple distinction of four variables, *mark*, *distinction*, *meaning*, and *world*, together with three functors, *action/experience*, *themelfunction*, and *exchange/order*, already gives an impression of the complicated knots the observer is entangled within when going for its reproduction (Kauffman 1995).

Note that our model just renders the variables of the quantors and the functors used by any specific observer to embody itself and enact an environment via the choice of values given to any one of the variables, respectively. Our model describes a set of possible variables which quickly develops into a rich network of values all of which will only be changed interdependently without, however, there being any necessary causal or temporal relationship defining how that change will happen.

### III.

The idea we would like to advance in order to develop further the argument quoted above consists in describing any distinction being drawn by an observer as a multi-valued distinction including a reference to itself. Both first-order and second-order observer depend on that multi-valued distinction when going for a mark whatsoever. It depends on the second-

order observer how rich in both structure and culture the implicit in any distinction gets made explicit.

The observer is all we have and all we need to explore and exploit the world we live in. We may choose to be aware of the choices we do in drawing a distinction. We may choose between the simplification going for a mark, on one hand, and the complication going for a form, on the other, and let us switch between the one and the other as suits any observer who accounts for the different perspective of any other observer.

The observer is enclosed within its own world. But it is able to enfold its enclosure with respect to any number of  $n$ -closures it considers appropriate, both by giving the space it acts and experiences in more depth, or by extending that space, both possibilities, however, as we are not meant to leave the form (Spencer Brown 1972, p. 59), amounting to the very same operation.

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