

# The Formalization of Cultural Psychology. Reasons and Functions

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**Abstract** In this paper I discuss two basic theses about the formalization of cultural psychology. First, I claim that formalization is a relevant, even necessary stage of development of this domain of science. This is so because formalization allows the scientific language to achieve a much needed autonomy from the commonsensical language of the phenomena that this science deals with. Second, I envisage the two main functions that formalization has to perform in the field of cultural psychology: on the one hand, it has to provide formal rules grounding and constraining the deductive construction of the general theory; on the other hand, it has to provide the devices for supporting the interpretation of local phenomena, in terms of the abductive reconstruction of the network of linkages among empirical occurrences comprising the local phenomena.

**Keywords** Cultural psychology · Formalization · Abduction · Abstractive generalization

## Introduction

A formal language is a set of symbols and rules defining the conditions for combining the former and for deriving further expressions from them. Symbols and rules of a formal system are necessarily defined in a complete and invariant way; therefore their meaning and implication do not depend on the contingency of the conditions of use. The formalization of a given domain of knowledge allows the meaning of concepts to be made explicit, standardized and generalizable across theories as well as focusing on the set of essential assumptions. Moreover, formalization channels the theorization, preventing the recourse to ad hoc and post hoc statements and pushing the researcher to clarify the reciprocal relationships between theories (Suppes 1968).

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It is not only physics and other so called hard sciences that adopt formalization. Linguistics and economics are example of social sciences that systematically use formalization. There are traditions of formalization in psychology too (especially in fields like psychophysics, perception, learning and artificial intelligence). Formalization in psychology has been mainly intending as a way of modelling quantitative relations among empirical constructs. As the traditions of psychonomics, psychometrics and mathematical psychology show (e.g. Shepard 1987; Vanpaemel and Lee 2012; see also McGuire 1989), quantitative formalization has developed in the study of psychophysical, perceptual, motor and cognitive processes. On the contrary, with some significant exceptions – e.g. Lewin (1936)‘s field theory as well as the Matte Blanco (1975) theory of the unconscious – the level of formalization of psychological research concerned with socio-cultural phenomena, as well as subjective lived experience (i.e. social, developmental, cultural, clinical psychology, psychoanalysis) is not so very changed from that which more than half a century ago led McGiugan (McGuigan 1953) to claim that “formalization is probably the major problem facing us today” (p. 377).

The purpose of this paper is to help to modify such a state of affairs, with specific focus on cultural psychology, intended as the science of sensemaking (Salvatore 2016; Valsiner 2014; for a systematic overview of this area of cultural psychology, see Valsiner and Rosa 2007 and Valsiner 2012). To this end, in what follows I highlight the reasons that press for making cultural psychology a formal science, namely a science whose processes of knowledge building are grounded on and constrained by formalized language. Then I discuss what kinds of formalization fit with cultural psychology. The reader will not find technical indications in the following pages - I do not have enough competence in formal systems to provide solutions. My aim is to call for mathematical models in order to promote the dialogue with those who can help cultural psychologists to formalize their language.

## **The Need for Formalization**

### **The Mission and the Condition of Cultural Psychology Is to Go beyond Common Sense**

The lack of formalization in cultural psychology is critical not because it has to gain legitimacy, by imitating hard sciences. My first thesis is that cultural psychology needs formalization because of its inherent recursive epistemological status, namely because it is an instance of human sensemaking.

I have devoted several papers (Salvatore 2011, 2013; 2015; 2016; Salvatore and Pagano 2005; Salvatore and Valsiner 2014, 2012) to discussing the epistemological and methodological implication of the recursivity of cultural psychology. To put it briefly, cultural psychology is aimed at understanding the constitution of the experience, namely the dynamics that makes meaning emerge and work in a certain way. Now, the “stuff” of such dynamics should not be confused with its output. In other words, the way sensemaking functions does not depend on and does not consist of the normative valence of its products, namely the content of the signs. Like the relation between grammar and speaking, such normative valence is a post hoc description of the way signs combine with each other, rather than the cause of their combinations. The reference to the content of the

signs is the commonsensical way in which human beings interpret their own and other's actions and communicational acts – e.g. “I did X because I was Y”, or “I did X because I wanted Y”; yet such a form of interpretation becomes critical when it is used as scientific psychological understanding. Indeed, the normative way defining how signs combine with each other *is* their meaning (Smedslund 1988; Wittgenstein, 1953/Wittgenstein 1958), as defined by the cultural field. As such, it is not the cause of sensemaking, but the way it works: *not what explains, but what has to be explained*. When cultural psychology confines itself to analysing the way a certain sign (e.g. a statement, a thought, a feeling) leads to/promotes a certain other sign (e.g. an act, another statement) it does not grasp the constitutive dynamics of sensemaking but works as a descriptor of the cultural environment, namely of the implicit linkages active within common sense. The latter is a relevant and worthy operation for cultural psychology since it allows human phenomena to be understood better, especially those that are not consistent with dominant cultures (Shweder 2000); yet it does not lead to any major enhancement in the modelling of how sensemaking works.

I have used (Salvatore 2014) the image of the coachman fly to highlight the limit of the psychological interpretation that seeks to understand the experience from within the experience, in so doing implicitly treating the recursivity of psychological science as if it meant to overlap the level of the *explanans* and the level of *explanandum*. The fable of the coachman fly tells the story of a fly buzzing around the head of the horse, and for this reason believing it is guiding the horse. Yet that was just an illusion: being over the horse's head was the *consequence*, not the *cause* of the horse's movement. The cultural psychologist that tries to explain sensemaking in terms of its content resembles the coachman fly in confusing cause and effect and in being blind to the fact that the very theorization of the cause of sensemaking is a phenomenon of sensemaking demanding to be explained (Salvatore 2014).

In sum, cultural psychology has to go beyond the experience for the sake of modelling it. And this means that it has to develop an autonomous language, namely a language the use of which is regulated by its inner rules and semantic and therefore does not depend on contextual conditions. Thanks to an autonomous language, the cultural psychology can step back from the commonsensical content of experience, in order to interpret it. Indeed, as has been said above, the content of the experience is normative, namely it is already endowed with its own inherent meaning, the one provided by the cultural environment, which channels and validates the commonsensical interpretation of it; consequently, any understanding of the experience made on the grounds of the commonsensical language cannot but reproduce what is already inscribed within common sense. For instance, take the rich stream of studies that have highlighted how people are more prone to give a situational account of the negative act when this act is performed by a member of the in-group. Now, is this an explanation of a constitutive dynamics of sensemaking? It seems to me that the answer cannot but be: no. The tendency to situational attribution is not the cause of the phenomenon at stake, but its effect, consisting of a particular normative implicit meaning that is part of the cultural environment. To detect it is an interesting, even useful, heuristic operation: it increases the knowledge of the normative cultural environment of a certain social group; yet it says nothing on how the circularity between minds and sensemaking works and in so doing produces and reproduces such culture. In other words, it is a matter of description of a local culture, rather than of psychological modelling. The fact

that contemporary cultural psychology tends to stop to this level of analysis is the main reason that makes it a sort of collection of determinants gathered despite – one might say, given the inability – modelling the dynamics that define their role as determinants. To refer to the previous example, we recognized that being a member of the in-group makes the difference in the attributive style. But why this happens, due to what mechanism of sensemaking is left unknown.

### Formalization for Autonomy

With the adoption of a formal language, scientific theorization assumes the normative semantic and syntactic apparatus of that language as the necessary and constraining condition by which vertical (i.e. derivation of an assertion from a set of premises) and horizontal (i.e. linkage between assertions put at the same logical level) assertions are made. The formal language performs two complementary functions - on the one hand, it limits the virtually infinite possibilities of linkages among statements; on the other hand, it serves as the grounds thanks to which some relations among assertions are defined. This means that by adopting a formal language, the theory-maker separates the domain of the process of knowledge building from that of the target of the knowledge – namely, the knowledge building comes to be regulated by a system of rules (i.e. the formal language) which is *autonomous from* the natural language in which the target phenomenon is represented in daily life.<sup>1</sup>

The separation between the language of the *explanans* (i.e. the language adopted for the sake of knowledge building) and the language of the *explanandum* (i.e. the commonsensical language used to represent the experience of the phenomenon in daily life) is particularly evident in quantum physics. The picture of the sub-atomic world that quantum physics provides is a set of mathematical equations, deduced from general formal premises. However, the meaning of such equations is not the same of their solutions- as Feynman (1999) underlined, to solve the equation is a necessary step, but then the solution needs to be interpreted in its qualitative consequence, namely in the particular way of seeing the phenomena they lead to.

“You can get from [Schrödinger] (...) equation “to atoms bonding in molecules, chemical valences - but when you look at the equation, you can see nothing of the wealth of phenomena that the chemists know about; or the idea that quarks are permanently bound so you can’t get a free quark - maybe you can and maybe you can’t, but the point is that when you look at the equation that supposedly describes quark behaviour, you can’t see why it should be so. (...) Dirac said that to *understand* a physical problem means to be able to see the answer without solving equations. Maybe he exaggerated; maybe solving equations is experience

<sup>1</sup> The discussion developed in this paragraph is based on the view of common sense as the informal system of knowledge and meanings (i.e. social representation, values, images, implicit theory of the world), enrooted within the cultural milieu, that grounds and channels the interpretation of the daily life experience. Accordingly, the common sense and the natural language are strictly intertwined: the common sense is embedded within natural language; the latter cannot but be exposed to the normativity of the commonsensical semantic. Yet, common sense and natural language have to be distinguished – indeed, on the one hand, the natural language is used in other context than other semantic (e.g. the scientific context); and, on the other hand, Smedslund (1988) showed how common sense could be subjected to formalization.

you need to gain understanding — but until you do understand, you're just solving equations” (Feynman 1999, pp. 201-202).

According to my argument, the autonomy of formal language is what cultural psychology needs to do its job. The adoption of a formal language is the decisive, indispensable step to gain the separation between the language of the *explanans* and the language of the *explanandum*: the grounding of cultural psychology on a language that is autonomous from common sense is the precondition for avoiding the coachman fly fallacy, namely the fallacy of reproducing/enacting the common sense when trying to understand its dynamics. Smedslund's claim concerning the *pseudoempirical* nature of psychological knowledge (e.g. Smedslund 1988) helps to be warned against this fallacy; yet this claim seems to have been unheard by contemporary psychology, which mainly aims at empirically describing the relation that is already part of the semiotic network substantiating the cultural environment. How common this tendency is, to confuse the commonsensical semiotic structures shaping the mind and the theoretical concepts used to describe them (and their micro-genesis), is shown by the simple observation of how many times, in contemporary psychological science, the theoretical statement involves the commonsensical definition of the phenomenon (e.g. emotion, intention, happiness, health, and so forth) to which the statement refers (Salvatore 2016).

Thus, according to my argument, the formalization of cultural psychology is not only a methodological device, namely the way of making the process of knowledge building more explicit, parsimonious, and rigorous. More radically, given the recursive nature of this domain of knowledge, formalization is the way cultural psychology can reach the epistemological condition of autonomy from its subject. Thanks to such autonomy, psychological science can systematically pursue the disentanglement of knowledge building from its products, and thus can go beyond the already known. And it can do it both from an intensional and extensional standpoint – namely, it can go beyond the (generally implicit) taken-for-granted commonsensical premises shaping the phenomena of sensemaking as well as generalizing the theoretical assertions to phenomenical domains different from those the theory referred to originally.

## Modes of Formalization

### The Abductive Quality of Cultural Psychology

The formalization of cultural psychology has to be consistent with the particular epistemological and theoretical status of this domain of knowledge. To put it briefly, sensemaking is a *field dynamics* (Salvatore 2016). This leads to the recognition of the *contingency* of semiotic phenomena (Salvatore 2014), namely the fact that – in the case of semiotic phenomena - the meaning of any occurrence does not lie in its empirical content but is defined by the relation between the occurrence and the dynamics it participates in (Salvatore and Valsiner 2010).

A fundamental consequence of contingency is that cultural psychology cannot be grounded on inductive generalization as the basic form of knowledge building. Indeed, induction is based on the assumption that occurrences can be aggregated in terms of the similarity of their empirical content –this is so because once aggregated in a class (a set of equivalent specimens), the regularity showed by the class comes to be generalized to the universe from which this set is assumed to be extracted. Now, the fact that the meaning of field phenomena does not lie in their empirical content prevents the very possibility of induction, because it implies that any aggregation of occurrences based on the similarity of their empirical content is void of validity: two occurrences with similar empirical content may have even opposite psychological meaning just as two very dissimilar occurrences may have an equivalent psychological meaning (Salvatore and Valsiner 2010). For instance, two similar specimens of aggressive behaviour can be interpreted – due to the field conditions of their enactment - as the sign of a destructive feeling, in one case, and as the sign of the persistence of the bond with the target of the behaviour, in another case (for the interpretation of anger as function of the attachment to the beloved, see Bowlby 1961).

The recognition of the epistemological constraints upon the adoption of inductive generalization in the study of sensemaking leads to the assumption that *abduction* is the appropriate methodological approach for cultural psychology. According to Peirce, abduction is the inference that reconstructs an event from the empirical occurrences, the latter being interpreted as the effect of the event, therefore as the indexical sign of it. Thus, abduction is aimed at defining the minimal not evident (past or present) phenomenon which, by happening, makes the occurrence meaningful (i.e. makes them a sign). In other words, the phenomenon is reconstructed due to the fact that it works as the ground of the plausibility of co-occurrences.

*[...] The form of inference [=abduction], therefore, is this*

*The surprising fact, C, is observed;*

*But if A were true, C would be a matter of course,*

*Hence, there is reason to suspect that A is true.” (Peirce, 1902/1932, CP 5.188-189)*

Induction and abduction start both from empirical evidence, from occurrences. Yet, whereas induction considers occurrences for the sake of detecting redundancies to be interpreted as a general law, abduction interprets the occurrences (i.e. the surprising fact C) as the effect/indicator of the phenomenon (i.e. A).

What it is important to highlight here is the fact that abductive inference needs to be grounded on a more general system of knowledge in order to be performed. Indeed, abduction works by making some occurrences (among the infinite possible) pertinent, interconnecting them in a meaningful pattern (what Peirce calls “the unification of the predicate”) and then interpreting this pattern in terms of the reconstruction of the event of which the pattern is the indexical sign (i.e. as C due to A). Now such heuristic operations can be carried out only in the light of a general theory constraining and channeling them.

## Abduction and Abstractive Generalization

The dependency of abduction on the general theory makes it the basis of a particular form of generalization- *abstractive generalization* (Salvatore 2011, 2014, 2016). On the one hand, abduction is aimed at building a local model of the particular, contingent phenomenon - it is the way of making sense of the dynamic network of the occurrences that makes the event unique, contingent, different from any other - this is why abduction is the core of the idiographic knowledge of psychological phenomena, consistent with their uniqueness (Salvatore and Valsiner 2009); on the other hand, the local model is grounded on the general theory – as observed above, any understanding of the local event requires a general background knowledge for the sake of performing the operation of pertinentization, patterning and reconstruction comprising abductive inference. It follows that the general theory develops in terms of its capability of grounding the abductive inference aimed at modelling the local phenomenon (Salvatore and Valsiner 2010). This is what abstractive generalization consists of: the general theory is not built in *extensional* terms, namely in terms of the generalization of the redundancies over the empirical content of the local phenomenon, but in an *intensional* way, namely in terms of a progressively increasing abstractness, as a result of the need to deal with the hermeneutic challenge coming from the local phenomena that need to be interpreted.

In sum, grounded on abduction, the advancement of knowledge is a matter of enabling the general theory to ground the understanding of more and more heterogeneous local phenomena. It is in this sense that abductive generalization is abstractive: the increasing capacity of the general theory to comprehend more and more heterogeneous phenomena is performed by and consists of its progressive abstraction, namely its progressive capability of grasping the fundamental rule(s) governing the way contingencies can be transformed into theoretical objects and as such understood.

This means that abstractive generalization does not advance by means of the accumulation of evidence but by reducing to the essential the system of knowledge required as hermeneutic grounds for the understanding of local semiotic phenomena.

It is worth underlining the abstractiveness of the general theory. It consists of the fact that its terms do not have specific empirical meaning. This cannot be otherwise. Indeed, only if void of empirical content can the general theory work as the grounds of the interpretation of a plurality of unique local phenomena. On the other hand, the very fact that the general theory has to interpret contingent occurrences logically implies that such occurrences may not be the content of the theory - otherwise the occurrences would not be contingent and unique. From a complementary standpoint, as we have said above, occurrences have no invariant psychological meaning, since their meaning is defined by the local field pattern they are part of and help to constitute. Consequently, in order to understand the contingent pattern, the general theory is required not to define the meaning of the occurrence once and for all. And this means that the general theory cannot be comprised of terms with an empirical meaning.

Needless to say, abstractiveness does not mean having no empirical referentiality. Geometrical concepts have not empirical meaning and it is precisely thanks to this that they can refer to an infinite set of things and even events (e.g. the love triangle), as categories interpreting the latter. The same can be for the concept of the abstract, general psychological theory. Concepts like *mediation*, *sign*, *field*, *sensemaking*,

*dynamics*, have no specific, invariant empirical content and that is precisely why they can be used for grounding the interpretation of an infinite set of phenomena. Accordingly, they are more similar to intensional, abstract concepts like “triangle” than to extensional empirical concepts like “apple”. They are second-order concepts, generalized categories, but not in the sense that the classes they denote are very extended. Rather, they are generalized in the sense that they are highly abstract, intensional concepts: they model a very selective theoretical focus according to and in terms of which any empirical occurrence is abstracted - namely the aspect of the phenomenon that the theory considers pertinent is foregrounded whereas the rest of it is put into the background (as to the notion of abstraction in terms of foregrounding, see Bühler, 1934/Bühler 1990). Thus, thanks to this abstractive capacity, theory is able to transform the phenomenon into the theoretical object, providing a conceptual framework for modelling it.

## Two Demands of Formalization

These considerations lead to the conclusion that cultural psychology works through the interplay of two forms of knowledge building – the *construction-extension of the abstract general theory* and the *modelling of local phenomena*.

As we have said, the two forms are circularly and dialectically connected - one uses the other as the condition for being carried out; yet the two forms adopt different logics and ways of working. On the one hand, the general theory’s development is a matter of deductive construction of linkages among statements, driven and constrained by the assumptions provided by the theory itself. Empirical data can provide hints and motives triggering the construction, but they are neither informative nor normative by themselves. Indeed, as has been said above, the general theory’s concepts (e.g. sensemaking, sign, field...) lie at a higher logical level than that concerning empirical concepts- the former are the second-order categories in terms of which the first-order empirical concepts acquire meaning. Thus, just as an Egyptian pyramid acquires its meaning from the geometrical concept of pyramid (rather than vice versa), the empirical data comprising the psychological phenomena acquire their meaning in terms of the abstract concept of the general theory. On the other hand, the modelling of local phenomena follows the logic of abductive inference: modelling a local phenomena is a matter of making a set of occurrences meaningful – namely, making them pertinent, identifying the immanent linkage that makes them a dynamic whole, and interpreting the latter as the indicator of a latent (synchronic and/or diachronic) psychological process.

My second thesis is that the two forms of knowledge building outlined above call for different modes of formalization.

### *The Construction of the General Theory*

The construction of the general theory requires an axiomatic system, grounding, constraining and channelling the deductive paths. The reference to such an axiomatic system would compel cultural psychology to formulate its basic assumptions in a clear and parsimonious way. Above all, the axiomatic system would provide the transformation rules governing the way further statements could be drawn from the basic axioms thus defined, the conditions of validity of such statements and the conditions of



validity of the connections between statements and phenomena. Some proposals have shown how topology (Mammen 1993), and set theory (Smith and Varzi 2000) are axiomatic systems that could work at the service of the formalization of cultural psychology 's general theory.

Recently, I proposed a geometrical approach to the modelling of sensemaking, envisaging a possible way of pursuing the formalization of the general theory (details can be found in Salvatore 2016, chap. 2 and 12). The starting point is the definition of sensemaking in terms of transition between a sign and its interpretant (Peirce). Accordingly, meaning consists of the activation of a certain pattern of transitions, selected from the potentially infinite possible meanings. The sign instantiated at the moment  $t$  is represented as a point on the semiotic phase space of meaning. The following sign is the one corresponding to the least distant point on the  $n$ -dimension sub-space of the phase space (assuming that the inverse of the distance between any dyad of points corresponds to the probability of combination of the corresponding dyad of signs). This means that the transition between signs can be represented in terms of the ever-changing transformation of the global shape of the sub-space defining the moment-by-moment sign-interpretant transition. One can recognize the similarity of this view with how the general relativity theory models the gravitational force - the body's movement produced by the gravitational force is not the effect of one discrete body on another but an inherent characteristic of the shape of the field (i.e. the curvature of space-time). Similarly, the meaning of the sign is not held within it but consists of the shape of the semiotic phase space that defines the distances from the potential interpretants.

The geometrical model of sensemaking outlined above allows the qualities and way of working of specific instances of sensemaking to be interpreted. For instance, the generalizing power of some signs endowed with homogenizing affective meaning (e.g. goodness, wellness, honesty, nation, and the like)– can be seen as endowed with a high semiotic mass, therefore producing significant modifications of the phase space, and are thus able to deviate the space-temporal trajectory of further signs (i.e. able to attract them). Accordingly, the tools of analytical geometry can be used to formalize the on-going transformation of the shape of the semiotic phase space. Thus, the analytical geometry could possibly provide a second-order picture of the dynamics of sensemaking and of the field conditions in terms of which it instantiates local phenomena of meaning-making (e.g. stereotypes, imagination, psychotherapeutic dialogue, and so forth).

### *The Modelling of Local Phenomena*

The Dynamic System Theory can play a major role in the formalization of the understanding of local phenomena of sensemaking (Lauro-Grotto et al. 2009; Salvatore et al. 2009; Salvatore and Tschacher 2012; Salvatore et al. 2015; for an overview of methods aimed at analysing developmental and field dynamic processes see Valsiner et al. 2009). As we said above, the abductive investigation of local phenomena involves foregrounding the set of pertinent co-occurrences that are selected due to their reciprocal interconnection. In order to be performed, this work of

pertinentization and patterning requires synchronic and diachronic variability to be taken into account (Salvatore 2014). Indeed, the abductive modelling of the dynamic whole is a matter of detection of the form of linkage among co-occurrences, where this form can be identified because - and on the condition that - it persists through the variability of the occurrences. In other words, the modelling of the psychological phenomenon as a dynamic whole consists of “extracting” (i.e. abstracting) what is always the same through what changes and it can thus be understood as the source of the changes (i.e. the developmental process, the principle of inner organization; cfr. Salvatore 2016). And this equates to saying that psychological phenomena are field processes, namely that they are made up of patterns of linkages among occurrences whose individual meaning is a function of the (synchronic and diachronic) bond the individual occurrence establishes with the whole (Salvatore and Valsiner 2010). For instance, the meaning of a certain word is not inherent to it; rather, it is a function of the field, namely of words it occurs with (i.e. the other words in the sentence) and in the sentences coming before and after it (Salvatore et al. 2012).

The Dynamic System Theory is a mathematical device that can be used to support the investigation of psychological phenomena in terms of field dynamics: it provides the way of formally modelling both the diachronic and the synchronic linkages among the occurrences, thus allowing the phenomenon to be detected as a whole dynamics. Accordingly, a set of equations formally map the system’s behaviour over time, as a function of the temporal evolution of its inner state and of the input, both depending on time too. More in particular, when the system’s behaviour can be mapped in terms of sequences of discrete states, in its simplest version the model takes the following form:  $X_{t+1} = r X_t$  - the state of the system at the given moment of time ( $X_{t+1}$ ) depends, by a function  $r$ , on the state of the system at the previous moment of time ( $X_t$ ).

Salvatore et al. (2010) is an instance of analysis of a local phenomena (the exchange between therapist and patient substantiating a whole case of psychotherapy) based on the Dynamic System Theory. They applied DFA (Discourse Flow Analysis) to the analysis of the verbatim transcript of the verbal exchange. DFA depicts each psychotherapy session through a set of parameters describing dynamic and structural properties of the temporal interconnections among meanings substantiating the verbal exchange between patient and therapist. An example of dynamic property is the capability of the network of meanings to produce semiotic novelty; an example of structural property is the level of connectivity of the network of meanings. The authors were not interested to measure the quantitative level of the parameters but focused on the trajectory of parameters through time and their global configuration. Among other analyses, they modelled the trajectory of the parameter detecting the incidence of generalized assumptions (called *super-ordered meanings*) in the communication in terms of a second-order equation, thus identifying the U-shape dynamics of such a parameter. This finding supported the modelling of psychotherapy process as a communicational system characterized by the alternation of two stages – the deconstructive and constructive stage. In the former stage the patient-therapist exchange works mainly as an external source of limitation on the (allegedly problematic) patient’s system of assumptions. The deconstruction, or at any rate the weakening of the patient’s critical generalized

meaning opens the way for the emergence of new meanings. This is what happens in the second stage, the constructive stage, when the patient-therapist dialog favors the emergence of semiotic novelty.

## Conclusion

In this paper I have argued the need to formalize the language of cultural psychology. I discussed how such a perspective is not a matter of imitation of the hard sciences but the main route for making cultural psychology autonomous from commonsensical language, in order to know it.

Thus, the adoption of a formal language in the field of cultural psychology is a methodological choice coming from the recognition of the particular epistemological status of such a science – the fact that it is recursive between observer and observed not only as the condition of knowledge (as all science are) but more radically as its object. It follows that the way of promoting the introduction of formal language in the field of cultural psychology is not merely a technical issue – e.g. a matter of choice of the formal system fitting the purposes of specific studies or branches of studies. Rather, the formalization of cultural psychology has to be grounded on the understanding of the epistemological specificity of the model of knowledge building characterizing this scientific field and oriented to pursue the enhancement of the autonomy of the language of theory from the language of the phenomena.

According to this perspective, I have showed that, due to the field contingency of its object, cultural psychology has to be grounded on a model of knowledge building based on the replacement of induction with abduction. In the frame of such a model, the contingency of the phenomena of sensemaking does not prevent the development of generalization; instead, the general theory develops through the uniqueness of the phenomena, in terms of its capacity to ground their local modelling. Thus, cultural psychology develops in terms of the dialectic, recursive linkage between two forms of knowledge building: the construction-enrichment of the general theory and the modelling of local phenomena. Formalization has a different meaning and different aims in relation to these two moments. In the case of the construction-enrichment of the general theory, formalization performs a syntactic function as its main task, namely it has to work as a system of formal rules grounding and constraining the deductive work of theorization. In the case of the modelling of the local phenomena, formalization has a mainly semantic function – it grounds the abductive operation consisting of the theory-driven construction and interpretation of empirical data (what I have referred to above as the work of pertinentization and patterning).

I am aware of how challenging the perspective outlined as far is. Traditionally, theorization and research in the field of cultural psychology are quite far from this way of considering the scientific enterprise. Moreover, formalization requires specific competence and a systematic interdisciplinary exchange – a task that by definition is highly demanding, because it makes the relation with the extraneous the condition of development. Above all, it

requires a systematic reflection on the epistemological and methodological status of cultural psychology – an effort that is even harder than interdisciplinary exchange, because it entails making oneself extraneous to oneself.

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