

## Towards a Psychology in Shades of Grey. An Epistemological Analysis

Mario Castellana (University of Salento),  
Daniele Chiffi<sup>1</sup> (Tallinn University of Technology),  
Alessandro Grecucci (University of Trento)

### Sunto:

Secondo il paper di Sergio Salvatore *Psychology as science of the explanandum*, è assolutamente necessario un linguaggio rigoroso per l'*explanandum* in psicologia. Questo atteggiamento è ciò che Sergio Salvatore chiama "psicologia in bianco e nero". Nel presente lavoro mostriamo come il metodo epistemologico dell'esplicazione possa essere uno strumento utile alla chiarificazione concettuale dei termini presenti nell'*explanandum* di una spiegazione psicologica. Due forme di esplicazione vengono presentate, l'esplicazione secondo Carnap e l'esplicazione secondo Kant. Diversamente dall'esplicazione secondo Carnap, l'esplicazione secondo Kant non richiede necessariamente un processo di formalizzazione e, per questa ragione, può essere più adeguata nel chiarificare termini psicologici complessi (eventualmente difficili da formalizzare). Tuttavia, la formalizzazione in psicologia può svolgere un ruolo molto importante. Astruendo da alcuni aspetti della 'realtà' (ad esempio, da alcuni dei suoi colori) è possibile chiarificare meglio la struttura profonda della realtà (quella in bianco e nero). Attraverso una rigorosa metodologia epistemologica possiamo persino immaginare, usando nuovamente la metafora dei colori di Sergio Salvatore, di vedere la realtà in sfumature di grigio.

**Parole chiave:** Sergio Salvatore, spiegazione, esplicazione, modelli in psicologia

**Abstract:** According to Sergio Salvatore's *Psychology as science of the explanandum*, there is an urgent need of a rigorous language for the *explanandum* in psychology. This attitude is what Salvatore calls "psychology in black and white". In this paper, we point out that the epistemological method of explication may be a good tool for the conceptual clarification of the terms that may work as the *explanandum* in a psychological explanation. Two forms of explications are presented, Carnap's explication and Kant's explication. Differently from Carnap's explication, Kant's explication does not necessarily require a process of formalization and, for this reason, it may be much more suitable for clarifying complex psychological terms (possibly difficult to be formalized). Still, formalization in psychology can accomplish a very important task. Abstracting by some aspects of 'reality' (e.g., by some of its colours) we can better elucidate the deeper structure of reality (in black and white) and, with sound epistemological methods, we can even imagine (using again Sergio Salvatore's metaphor of colours) to see reality in shades of grey.

**Keywords:** Sergio Salvatore . Explanation . Explication. Models in psychology

---

1 Corresponding author: Daniele Chiffi, Tallinn University of Technology, Ragnar Nurkse School of Innovation and Governance, Akadeemia tee 3, 12618 Tallinn, Estonia. Email: [chiffidaniele@gmail.com](mailto:chiffidaniele@gmail.com).

## 1. Introduction

It is quite uncommon to get acquainted with a book whose introduction may be conceived as intellectually stimulating as whole book in itself; this is the case for the Introduction to Sergio Salvatore's book, *Psychology in Black and White. The Project of a Theory-Driven Science* (Salvatore, 2015). A slightly revised version of the Introduction has been recently published in this journal (Salvatore, 2016). Sergio Salvatore's book aims to assess the epistemological status of scientific psychology, enriched in the last years by an increasing number of research of empirical nature; in virtues of that, Sergio Salvatore favours an interdisciplinary perspective which falls between philosophy of science and empirical research in order to elucidate epistemological and methodological presuppositions of psychology. In the light of this, it is significant, but at the same time provocative, the title of the Introduction: 'Psychology as the Science of the Explanandum', where he makes a clear sweep of cliché concerning psychology as a science and, consequently, the profession of psychologist or psychotherapist.

Salvatore's Introduction contains milestones for (the epistemological discussion on) psychology and its conceptual structure. Such conceptual milestones should be 'grasped' all together in order to properly understand their effects and implications. It's no doubt, such milestones may constitute the basis for a conceptual turn (an 'epistemological rupture' in Bachelard's (1986) terms), for a view and practice of psychology as a scientific endeavour. Such turn is achieved not from a perspective which falls outside science, but within the most recent developments of psychology. Salvatore's idea of 'Psychology as a Theory-Driven Science' enables him to reconsider, *in black and white*, the scientific dimension of psychology together with its recent history.

A first and fundamental issue is the reappraisal of the conceptual dimension of psychology, which is nowadays a minor topic in

psychology compared to extremely reductionist and empirical views on current psychological research. This allows Salvatore to provide a *pars destruens* in order to make psychology free from a perspective of blind empiricism, following the lack of critical epistemological reflection. In virtues of this, Salvatore's paper underlines the necessity of an epistemic discontinuity with common sense, which has been the implicit background for traditional psychological research. The connection between psychological research and common sense can be viewed as an "epistemological obstacle" in the sense of Gaston Bachelard, causing an uncritical (and empirical) attitude and avoiding a 'progressive conceptualization' (in the sense of Riemann) and abstraction as in physical and mathematical sciences.

Another related topic is the radical critic of ingenuous realism, which assumes common sense and the fundamental criterion for a certain psychological knowledge and constitutes the conceptual knowledge of its own 'object'. Psychological knowledge in itself must be methodologically distant from the 'real' object in order to scientifically grasp it at different levels and articulations, as it happens to be in other sciences, e.g., economy and other historical and social sciences, in which theoretical objects work as powerful heuristic tools. This is exactly what Ludwig Boltzman called at the end of the XIX century *the power of theoretical objects*. The necessity of such power is urgently invoked for psychology by Salvatore. Psychology, as every science, must be able to create theories together with models in order to better know its own object(s) of investigation, free from common sense definitions. Theories *plus* models are required in order to handle empirical data in a sound way and to insert them in a theoretical framework with regulative criteria and constraints.

According to Salvatore, a theory-driven approach is necessary: (i) to provide a higher level of epistemic consistency to psychology,

(ii) to give psychology a remarkable level of autonomy, (iii) to enhance the understanding of the psychological dimension of knowing processes. Moreover, a theory-driven approach enables psychology to develop an appropriate scientific language within which its ‘objects’ receive a rigorous meaning, which turns out to be very different from the ingenuous (and correspondentist) views of common sense. This amounts to be what Salvatore calls “a Copernican shift: the change from an empirical science, as contemporary psychology self-represents itself, into a model-based science”, in the face of the radical anti-empirical turn due to a Theory-Driven approach. Being a scientist with key philosophical insights, Salvatore does not merely devote his efforts in the construction of the scientific basis of a theory, but he articulates also a process of conceptual clarification in order to understand the epistemological and ontological implications of his work in psychology.

The *pars construens* of Salvatore’s ‘epistemological rupture’ shows its main and important role in a considerable change for the understanding of many aspects of the epistemic structure of psychology. Psychology should be shaped by a model-based ‘logic’ in order to interpret human experience according to its cognitive sense. Few models have been proposed in time by various researchers (see, for example, classic Sperling’s (1960) model of short-term retention of visual verbal material).

It seems that a theory-driven approach may help us to understand human experience. In the light of this, Salvatore holds the thesis that psychology should not only take care of the *explanans* (what explains a certain phenomenon), but it should attempt to provide conceptual changes, that is, it should be a *science of the explanandum* (what must be explained). The meaning associated with the *explanandum* cannot be simply decided by common sense. On the contrary, psychology must become a science of sense-making, with the implementation of formal tools and abductive and ampliative forms of reasoning. This seems to be the main challenging but

fascinating task of Sergio Salvatore’s *psychology as the science of the explanandum*. In the next Sections, we will suggest – using Salvatore’s metaphor – that a further step may be a shift from “a psychology in black and white” to a “psychology in shades of grey”, in which colours are abstracted using a rigorous epistemology, still the shades of grey (composed by the combination of black and white components) help us to differentiate the main colours. Section 2 compares Salvatore’s views on meaning clarification in science and the methodology of explication. Concluding epistemological remarks are expressed in Section 3.

## 2. Explication and the attempts of explanation in psychology

As analytically remarked by Sergio Salvatore, explanations play an essential role in science and in psychology. He argues that psychology cannot be easily reduced to the evidence-based approach and underlines the fruitfulness of an essential use of the methodology of explanation in science and psychology. The nature of explanation in psychology is a delicate issue, since it is not clear if it is a functional (teleological), nomological-deductive, or statistically inductive type of explanation.

There are different types of scientific explanations. Salvatore’s views seem to have some flavours of the functional (teleological) account of explanations, since he underlines the relation between the *explanandum* and the goals of a psychological construct. What is more interesting is, however, Salvatore’s inquiry into the problem of the relation between the language of common sense and scientific explanations in science. This is usually adopted in defining the *explanandum*, whereas the language used for the *explanans* is much more influenced by the language used in psychology or in a specific psychological theory. Still, the language of common sense affects psychological language at the level of *explanandum*, that is, at the level of the phenomenon to be explained. Given the

ambiguities associated to the language of common sense, if a certain level of opacity affects the meaning of the *explanandum*, then a certain level of ambiguity may still remain associated with the *explanans*. This is a very key issue, as acknowledged by Sergio Salvatore. Indeed, according to Salvatore, psychology should become the science of the *explanandum*, meaning that also the language used for the *explanandum* has to be analytically ‘constructed’ within the rigorous language of psychology, as it happens to be for instance for natural sciences.

The problem of providing a clarification of the language used in the process of explanation in science is not a new one and, as we will see, it has an interesting philosophical tradition. It is not very easy to construct a scientific *explanantion* when the terminology used specifically at the level of the *explanandum* is not rigorous but open to ambiguities. Before the construction of an explanation it is convenient to provide a meaning clarification of the terms involved in it, even the terms belonging to the language of common sense. In its more rigorous form, this meaning clarification of the terms that may be used in a scientific explanation is called *explication*. An explication is a procedure of theoretical clarification of an inexact prescientific concept, the *explicandum*, with a precise and scientific concept, the *explicatum*, so that the *explicatum* must be:

- i) Similar to the *explicandum*;
  - ii) More exact and informative than the *explicandum*;
  - iii) Simple in order to be easily formalised;
- Moreover,
- iv) an explication connects the *explicatum* with a rigorous system of scientific concepts (Carnap, 1950).

As pointed out by Carnap, there is the need to avoid the ambiguities of natural language by trying to substitute the vague notion present in the *explicandum* with a more rigorous and scientific one expressed in the *explicatum*. Once we have an *explicatum*, then we can use it subsequently within the process of scientific explanation. In other words, scien-

tific explanation requires meaning clarification or even a complete explication. Of course, the *explicandum* is not equivalent with the *explicatum* under all aspects (we might say that we cannot see some colours of the *explicandum*), but still it should express the core meaning of the *explicatum* (making clearer the theoretical structure of the *explicatum*). In this way, imprecise notions can be ruled out in the scientific discourse in order to avoid ambiguities in scientific explanations. For instance, rather than talking of the qualitative “confirmation” of a theory, it may be possible to substitute this notion with a more precise notion of “degree of probabilistic confirmation” of a theory within the framework of probability calculus. However, the explication procedure has an intimate connection with formalization. Therefore, one might argue that not all aspects of psychological theory can be formalized and therefore the explication procedure is inadequate in psychology. Even if many attempts to use formalization are nowadays very common in psychology, and also Sergio Salvatore seems to be sympathetic with this view, nonetheless it is possible to use explication in a weaker sense in psychology. Such a weaker sense is provided by Kant in “The Discipline of Pure Reason in Its Dogmatic Employment” within the *Transcendental Doctrine of Method* of the *Kritik der reinen Vernunft* (Kant, 1965). For a fundamental analysis of the Kantian account of explication, see (Bonniolo, 2003). Kantian explication is a process of meaning clarification of a vague concept that does not necessarily require any formalization, but still it relies on a rigorous language. In both senses of explication, the complex and vague aspects of the meaning of scientific terms are reduced to their more objective and central meaning, i.e., all colours are reduced to white and black. Still, using again Salvatore’s metaphor on colours, we might say that Carnap’s explication sees the world as black and white, Kant’s explication sees the world in shades of grey. Both types of explication are, thus, basically attempts of meaning reductionism. However, we argue

that a Kantian view on the explication of the terms of contemporary psychology may, on the one hand, clarify and recognize a rigorous dimension of psychological knowledge, contrary to many extremely postmodernist views. On the other hand, it may ensure the ideographic nature of psychological and clinical knowledge, which cannot be completely handled by extreme forms of reductionism as it happens to be, for instance, in the evidence-based approach. The interplay between epidemiologic (population-based knowledge) and clinical knowledge is a key issue also in other fields of clinical practice, specifically for diagnostics and prognostics ((Chiffi and Zanotti, 2015, 2016, 2017a, 2017b), Zanotti and Chiffi (2015, 2016a, 2016b), Giaretta and Chiffi (2013)). As suggested by Sergio Salvatore, it is worth noting, however, that the elucidation of some problems of the evidence-based approach in psychology does not imply the abuse of intuition, common sense and the systematic violation of clinical guidelines.

### 3. Concluding Remarks

In this short essay, a critical analysis of Sergio Salvatore's idea of psychology as a science of the *explanandum* has been pointed out. We have outlined the benefits of considering psychology as a theory-driven science, in which population-based knowledge is very unlikely to be *directly* applied to a specific clinical context, because of the emergent features on the clinical encounter. Theories and models should indicate how to relate population-based evidence with specific clinical cases in order to provide person-centered care (Miles and Loughlin, 2011). We strongly agree on the relevance of using theories, ex-

planations and models in psychology. Unfortunately, as remarked by Sergio Salvatore, many current psychological models incorporate the view that the *explanandum* has to be defined by means of the language used in common sense. According to Salvatore (2015, 2016), there is an urgent need of a rigorous language for the *explanandum* in psychology. We have pointed out that the epistemological method of explication may be a good tool for the conceptual clarification of the terms that may work as the *explanandum* in a psychological explanation, especially when we aim to investigate the mechanisms behind the explanation. Two forms of explications have been presented, Carnap's explication and Kant's explication. Differently from Carnap's explication, Kant's explication does not necessarily require a process of formalization and, for this reason, it may be much more suitable for clarifying complex psychological terms (possibly difficult to be formalized). Still, formalizations in psychology can accomplish a very important task. Abstracting by some aspects of reality (e.g., some colours of reality) we can better elucidate the deeper structure of reality (in black and white). However, the subtle distinctions and the process of meaning clarification of explication may enable us to see more differences in colours rather than black or white. It follows the necessity of a psychology in shades of grey.

#### Acknowledgements

The research of Daniele Chiffi is supported by the Estonian Research Council, PUT1305 ("Abduction in the Age of Fundamental Uncertainty", 2016-2018, PI Ahti-Veikko Pietarinen).

## References

- Bachelard, G. (1986 [1938]). *The Formation of the Scientific Mind: A Contribution to a Psychoanalysis of Objective Knowledge*. Boston: Beacon Press.
- Boniolo, G. (2003.) Kant's explication and Carnap's explication. *International Philosophical Quarterly*, 43(3), 289-298.
- Carnap, R. (1950). *Logical Foundations of Probability*. Chicago: University of Chicago Press.
- Chiffi, D. and R. Zanotti (2015). Medical and nursing diagnoses: A critical comparison. *Journal of Evaluation in Clinical Practice*, 21(1): 1-6.
- Chiffi, D. and R. Zanotti (2016). Perspectives on clinical possibility: elements of analysis. *Journal of Evaluation in Clinical Practice*, 22(4):509-14.
- Chiffi, D. and R. Zanotti (2017a). Fear of Knowledge. Clinical Hypotheses in Diagnostic and Prognostic Reasoning. *Journal of Evaluation in Clinical Practice*. *Forthcoming*
- Chiffi, D. and R. Zanotti (2017b). Knowledge and Belief in Placebo Effect. *Journal of Medicine and Philosophy*. *Forthcoming*
- Giaretta, P. and D. Chiffi (2013). Causal Attribution and Crossing over between Probabilities in Clinical Diagnosis. In C. Svennerlind, J. Almäng, R. Ingthorsson 2013 (Eds.), *Johanssonian Investigations. Essays in Honour of Ingvar Johansson on His Seventieth Birthday* (pp. 191- 211). Frankfurt: Ontos Verlag.
- Kant, I. (1965 [1781]). *Critique of Pure Reason*, trans. by N. Kemp Smith, New York: St. Martin's Press.
- Miles, A., and Loughlin, M. (2011). Models in the balance: evidence-based medicine versus evidence-informed individualized care. *Journal of Evaluation in Clinical Practice*, 17(4), 531-536.
- Salvatore, S. (2015). *Psychology in Black and White: The Project of a Theory-driven Science*. Charlotte, NC: Information Age Publishing.
- Salvatore, S. (2016). Psychology as science of the explanandum. *International Journal of Psychoanalysis and Education*, 7(1) : 7-22.
- Sperling, G. (1960). The information available in brief visual presentations. *Psychological monographs: General and applied*, 74(11), 1.
- Zanotti, R. and D. Chiffi, (2015) Diagnostic frameworks and nursing diagnoses: A normative stance. *Nursing Philosophy*, 16(1): 64-73.
- Zanotti, R. and D. Chiffi, D. (2016a). A Normative Analysis of Nursing Knowledge. *Nursing Inquiry*, 23(1): 4–11
- Zanotti, R. and D. Chiffi, D. (2016b). Nursing Knowledge: Hints from the Placebo Effect. *Nursing Philosophy*, doi: 10.1111/nup.12140