

Series Editor's Preface

A New Theory of Categories and Its Abductive Potential

Theories in psychology can be built on multiple axiomatic grounds. The basic criterion that can be used to evaluate their consistency is their deductive elaboration that eventually leads to their arena of bridging with the phenomena under study. Can an abstract theory selectively help us to derive generalized understanding of basic principles from the phenomena? Or is such theory merely a nominal label for various games of “empirical science” played at the junction of the phenomena and “the data”? Psychology of today is filled with many examples of the latter. In a refreshing contrast, Jens Mammen systematically outlines an example of the former. His message in this book is powerfully clear—principles of psychology have generality similar to that of other basic sciences. His elaboration of one of such general frameworks in this book—based on the axiomata of classical logic of Boole and Aristotle—proves the verdict of Immanuel Kant wrong. Kant—in the late eighteenth century—predicted that two disciplines would never be capable of becoming *Wissenschaften* for reasons of lack of mathematical formalizability. One of these was chemistry, the other being psychology. For chemistry, Kant was proven wrong between 1813 and the 1870s by Berzelius and Mendeleev (Klein, 2004). For psychology, Jens Mammen accomplishes this task almost two centuries later, in this book.

But why has it taken psychology to go beyond Kant so long? The key for theoretical progress in a science is based on the issues of relation between the deductive and inductive lines of thinking—that the adequacy and generative power of the given theoretical structure can be determined. An abstract system of thought can lead to an innovative view upon the phenomena. Yet, equally easily, it can lead to a fixed perspective that turns theories into dogmas. The latter is the end of *Wissenschaft* and the beginning of social-political games played under the label of “empirical science” in societies that value the practical usefulness of “evidence-based” accumulation of experiences. The latter does not need theoretical advancements to guide itself to new knowledge—the nominal use of theoretical labels as fashionable categories is enough. In psychology, the historical road from positivism to “positive

psychology”—through the purgatory of intense fights against “dualisms” in the twentieth century—has led to de-emphasizing the centrality of theory in the science of human ways of being.

Jens Mammen in this book reverses that trend. Psychology needs general abstract theories—and his meticulous elaboration of the theory of categories in this book provides the reader with a beautiful example. Let me—based on the reading of this book—introduce the notion of the **field of abductive potential (FAP)** that would allow us to analyze the generativity of a theoretical system. It is the potential of an abstract system to give rise to new perspectives on the phenomena that have previously been overlooked. FAP is built on the understanding of the process of abduction—in contrast to deduction or induction—introduced by Charles Sanders Peirce over a century ago. In his version, abduction is a “jump” in our understanding of the phenomena where a new explanatory principle becomes introduced on the basis of otherwise unexplainable (by accepted theoretical frame) known principles. If a surprising fact X is observed, and known principles A and B fail to explain it, introducing a new one—C—would explain the fact in a matter of course. A theory that can introduce the C to add to A and B has $FAP > 1$; a theory that sets strict limits on all facts to be explained by either A or B (or their “interaction” A & B) has $FAP = 1$. In psychology, the general linear model that dominates theoretical discourses has $FAP = 1$. It needs to expand to allowing for nonlinearity since all psychological phenomena are better assumed to be of that kind and be organized by principles of catalysis rather than those of causality (Cabell and Valsiner, 2014).

Abductive leaps are rare and emerge slowly in histories of sciences. The Riemann-Lobachevsky move to extend the Euclidean geometry is an example of where an obvious potential idea remained overlooked for two millennia. It took contemporary biology to replace the dogmas of genetic determinacy by new thinking in terms of epigenesis about 150 years since Jean-Baptiste Lamarck first dared to hint at the possibility of practice leading to biological innovation. In psychology, such oversights come from the link of the science with the sociopolitical and socioethical premises of human living. This is both the curse and the savior of the discipline as a science of human *being* (Valsiner, Marsico, Chaudhary, Sato, and Dazzani, 2016). We affectively relate to our own selves—creating borders for our own understanding of the human psyche as we ourselves as human beings escape from some of its revelations (Devereux, 1967).

FAP highlights the generative potential of a theory. For some theories, FAP can be 0 (these would be theories that serve as “umbrella” covers for labeling empirical research practices as if “theoretically based”), for others 1 (theoretical systems that account for precisely the empirical evidence it claims to cover—but has no extension potential to new evidence). It is evident that FAP of the magnitude >1 is what any theoretical breakthrough in a discipline would need. Some examples of the building of empirical theoretical psychology (van Geert, 1998) exist—a theoretical model based on observable evidence needs to be testable, empirically or theoretically, on the whole range of *possible* evidence. Much of the latter may never be empirically accessible, or it may be by luck or persistence that it becomes so. The half-century search for gravity waves (Collins, 2003) is an example of the latter—a

theoretical model led to active and overwhelming search for the momentary phenomena that would be crucial for proving the theory. At the same time, the “big data” accumulated were irrelevant for the search—until the moment of the detection of the *single instance* of the actions of the gravity waves. At that moment, that single instance becomes crucial empirical evidence—and the huge accumulation of empirical data vanishes in its importance. Psychology—in its focus on data collection—may have much to learn from astrophysics. FAP value of a theory leads to interpretation of the data—while no theory can grow out of the data, through inductive generalization.

Mammen's theory as outlined in this book clearly has $FAP > 1$. Starting from classical logic, he moves into realms of derived argumentation that opens new alleys for asking questions about our everyday life practices. The unity of his two kinds of basic parts of the whole—which he calls *choice* and *sense* categories in this book—opens the door to transcend the hegemony of the cognitive science to look at the unity of affective and mental processes within the same whole. All of our human psychological phenomena are of such united kind. Psychologists may differ in their allocation of primacy of one kind over the other—but it is the unity of both within the same theoretical system that leads to new empirically testable hypotheses and new social practices. Jens Mammen's book is a clear and concise example of how building a highly abstract theoretical framework can innovate the discipline. The thoughtful readers of this book will not be disappointed—while the representatives of the “empirical science” believers in psychology may pass it by as too complex a reading in our contemporary world of fragmentation of knowledge and quick evaluative opinions. Yet it is not the opinions that will prevail, but carefully constructed theoretical systems. This book is a pleasure for the *connoisseurs* of the latter.

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