



Ground-Breaking Innovations in General Psychology

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Published online: 24 May 2019

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Abstract

The article addresses two recently published books in General Psychology by Niels Engelsted and Jens Mammen. The two approaches offer in their own way solutions to the so-called ‘crisis of psychology’. Mammen’s new logical foundation for psychology is based on two different properties of the objects we relate to: those characterizing the objects appearances, and those characterizing the objects as unique substances or singulars distributed in time and space - the *existence* of the objects as opposed to the *appearance* of the objects. Engelsted makes a journey from Aristotle (384–322 BC) until today’s psychology in his quest to identify the domain of psychology. He places the psyche in the natural world as a result of locomotion in the first, most simple animal life. The domain of psychology includes intentionality, mind and consciousness.

Keywords General psychology · Crisis of psychology · Subject and object · Causality · Intentionality · Interface and interspace · Sense- and choice categories

Introduction

The article is a review of two books within a Danish general psychology. They were published in 2017 in Jaan Valsiner’s *The Springer Brief series: Niels Engelsted’s Catching Up With Aristotle: A Journey in Quest of General Psychology*, and Jens Mammen’s *A New Logical Foundation for Psychology*.

Both books are a recapitulation of the most central parts of their lifelong work in Danish General Psychology as researchers and teachers at Copenhagen and Aarhus University in Denmark. The books are also partly a result of the collaboration between the two researchers in their attempt to solve at least some of the basic and exiting

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challenges of psychology. For Engelsted, the basic challenge has been to situate the foundation of psychology in biology and evolution without reducing the qualitative properties of psychological phenomena. For Mammen, the basic challenge has been the inability of traditional cognitive psychology to capture the particular human characteristics.

Engelsted was the head of the Department of Psychology at the University of Copenhagen, and retired from teaching in 2012. It was here we were introduced to his work - and followed his teaching in the subject area 'General Psychology' in the end of the 80th. Mammen is currently an emeritus professor at Aarhus University, and since 2009 an honorary professor at Aalborg University. In the 60th, he studied Mathematics, Physics and Chemistry at the Niels Bohr Institute and Psychology at the University of Copenhagen.

The Crisis of Psychology and General Psychology

Both authors address the basic problems of psychology in an original and theoretically challenging way. They take up a "tradition" that deals with "the Crisis of Psychology", which was the brand name of the state of psychology from the end of the nineteenth century until some decades into the twentieth century. For instance, Engelsted refers to Sigmund Koch and David Leary's (1992) report on the state of psychology after 100 years. They arrive at the disappointing conclusion that the domain of psychology is "a jumbled 'hidden-figure puzzle' that contains no figure" (Engelsted 2017: 12).

It is argued, that without a unifying map to show the science's domain, psychology is left with a mixed bag of unrelated theories and disciplines, and thus has a questionable scientific status. It is in this context the two authors' works is significant. During the last decades there have not been talked much about the crisis of psychology, and Engelsted suggests, that this is the true crisis (Engelsted 2017: 6).

The authors trace the crisis to European Renaissance and the new natural science of Galileo Galilei (1564–1642), named 'the Aristotle-Galileo breach'. Galilei threw out Aristotle's explanation of 'purpose' (the *final cause*), which means the end or *purpose* of something, e.g., a movement, where the cause is at the end (goal) of the movement. It was rightfully rejected as scientific explanation in his new 'mechanistic' science, however, for the human sciences it was a disaster. In the following centuries, only Galileo's new understanding of causality (the Aristotelian *effective cause*) was accepted in science and mainstream psychology, and it created the dualistic contradictions between natural science and the humanities as non-compatibles.

The crisis of psychology has to do with the many unsolved dualisms that characterize psychology, such as mind-body, mind-world, the split between the causal natural sciences and the hermeneutical human sciences. Among many others mentioned in the books, Descartes (1596–1650), a great supporter of Galilei's mechanical physics, suggested that the body and the soul were fundamentally different substances: on the one side, the body in contact with the physical world (*res extensa*), and on the other side the non-physical soul (*res cogitans*) in contact with God.

According to the authors, the crisis of psychology is therefore whether we can talk about psychology as a coherent science, with its own special domain and theories and methods of its own. This question is assigned to General Psychology. General

psychology deals with what is common in psychology and examines the possibility that psychology can be understood as a coherent unitary science.

Danish general psychology was facilitated partly by reviving Marxist enlightenment in European universities in the 1970s, partly by the discovery of Lev S. Vygotsky (1896–1934) and his cultural-historical school, in particular Alexei N. Leontiev's (1903–1979) psycho-phylogenetic activity model, which according to Engelsted is a virtual mirror image of Aristotle's bio-psychological taxonomy - but now understood evolutionarily.

We provide a short review of the books separately, where we focus on what we think the two psychological works bring of theoretical innovations to the field, and then we will illustrate where some aspects of their theories may jointly bring innovations to the theoretical field of psychology.

A New Logical Foundation for Psychology

Mammen starts the book with his understanding of the basic problems of psychology and some considerations about the position of psychology in the landscape of the sciences, where the domain of psychology is divided between natural and human sciences. He asks where psychology is in this landscape or battlefield. Here, his criticism of the limitations of dominant mechanistic psychology and his suggestion for a fundamental other understanding of our relationship with the world - going beyond mechanicism - is central to his work. He points out that when psychology don't know its place or domain in the scientific division and cooperation, then psychology is in a danger of being 'eaten' by natural sciences and mechanistic causality on one hand, and human sciences and hermeneutics and discourses on the other hand - which legitimate and support each other as opposites in their 'eating' the domain of psychology with alternate success and domination.

Mammen suggests a third way to go, which is founded in human's practical 'being-in-the-world', where human's relationship to the world and to other people is understood as a dual subject-object relationship in a new logical foundation for psychology. And it is really a logical foundation, since our relations to our world is not only described in a psychological language, but also in a more formal and precise manner in a mathematical language as a tool consisting of eleven axioms and theorems. Hence, Mammen's work consists in a psychological theory and a mathematical axiomatic system. However, it should not deter non-mathematicians from reading the book, as it describes its main subjects in a clear psychological language.

The Duality in Animal and Human Subject-Object Relations

The book is concerned with the general and basic structure of our activities in the world, i.e. the historical and spatial subject-object and subject-subject relations in our natural and societal world. According to Mammen all objects can - independent of our relations to them - be characterized by two different properties: those characterizing the objects appearance and features and those characterizing the objects as unique substances or singulars distributed in time and space with historical threads back to their origins - the *existence* of the objects as opposed to the *appearance* of the objects.

This duality in our relation to the world is the key issue in the book. We are in a double relation to our world because the objects we relate to have the property of a double structure. An object in this context should be understood very broadly: as both physical objects and living beings.

The categorization of the objects' existence in time and space is named *choice categories*, and the categorization of the objects appearances is named *sense categories*. Mammen refers to Kant: "In more philosophical terms are sense categories defined from their *qualitative identity*, and choice categories from their *numerical identity*"¹ (Mammen 2017: 63).

The duality of objects and corresponding duality in subject-object relations is well-known in our common-sense understandings and practical life. However, as a distinction moulded in psychological and mathematical categories in a stringent, clear and instructive way, it is new - especially Mammen's formulations of 11 mathematical axioms, describing the categories and their combinations in a formal and precise manner, which has a great significance for both mathematics and psychology.²

When a subject gets in contact with an object, the double structure is expressed on the one hand as an active and selecting directedness and retention of the object as a particularity, and on the other hand as the subject's sensory interactions with the object.

All physical objects have this double structure and can be categorised independently or in different combinations by choice and sense categories. The choice-category embrace the sense category, in the sense that it is possible to identify an object by a choice category alone (by grasping or grabbing an object), but objects can't be identified by sense categories alone.

The objects are distributed in specific positions in the physical space and with certain properties or qualities, which are not dependent on their positions in time and space and vice versa. With the categories we can divide all physical objects, regardless of their connections to a subject, into their qualitative identity or 'natural properties' such as form, colour, structure, texture on the one hand, and their numerical identity or 'historical characteristics' (uniqueness, particularity) in terms of their historical origin and continuous distribution in time and space. Understood as numerical identities the objects are identical to themselves across space and time. It is the same object, only changed!

The traditional mathematics, which most of us learned in school, is in a way 'worldless' in its formalism and 'abstractionism'. The mathematical operations, as e.g. addition, is usually described in universal and 'anonymous' terms, with no references to the particularity or concrete matter of the objects of addition, and also independent of where and when and who sets the pupils a mathematical task and how and why the teacher chooses the mathematical objects.

The choice categories are in accordance with the axiom of choice not rule-bound (they are non-algorithmic), which is unheard in the field of mathematics

¹ Qualitative identity refers to 'quality' as the properties of objects that are possible to sense (the appearance of the objects). Numerical identity refers to the question of whether it is the same or another object. If we combine the two kinds of identities, we can understand how a qualitatively altered object can be the same object whether it has changed or not (e.g. a person's identity is the same, although the person has changed dramatically in his or her appearance).

² Mammen's axioms are these days discussed at the Department of Mathematical Sciences at the University of Copenhagen

(and therefore still some mathematicians are sceptical to accept the axiom of choice as a mathematical axiom).

The choice and sense categories can describe the objective and subjective side of the subject's relationship to the world in its sense structure and existential relations - i.e. describe the psychological relations' topology. Sense categories refer to discrimination (as sensation) between objects, whereas choice categories refer to the identification (pick out, grabbing) of objects, but the discrimination is normally only possible by virtue of a choice-categorical framework (e.g. a basket of selected objects). There must be a minimum of choice categorial retention in order to make it possible to identify objects.³

The Human Sense

There are some essential differences between animal's and human's dual relations to their world. Mammen states, "...a new *structure* is found in these relations. In human life the relations are enriched with a structure of *threads* or *bonds*, tying the individual to objects *beyond* their features and beyond, and independent of, their being present and accessible or not" (Mammen 2017: 43).

Human's activities in relation to objects and persons spin invisible threads and tie strong bonds especially to other persons. The specific characteristics of the duality in human relations to the world of objects is the ability to maintain things in their "historical depth" in time and space as numerical identities despite their changes as qualitative identities.

Subjects are attached to objects (e.g. the objects' sentimental value) and other subjects, which are irreplaceable as numerical identities. Without the ability to maintain objects over time, one cannot talk about attachment. The attachment refers to keeping and maintaining the object as numerical identity across its qualitative changes over time. Human drama is about keeping and breaking the bonds of attachment.

An example is mourning due to a broken bond to a person. It has a subjective and an objective side, where the subjective side is the emotional grieving, which will ease off over time. The objective side refers to a relation transcending ourselves in the loss of something irreplaceable (Mammen 1997). The loss is an objective - ideal and historical - broken bond, and it cannot be overcome. We do not grieve because of the person's properties or personal description. We grieve because we have lost a concrete person. Functionalistic psychology cannot capture neither the objective loss nor the subjective mourning.

Mammen presents some examples of the historical depth in human's concrete sense. One illustrative example is two coins, where one is a genuine and valid coin, but the other one is a counterfeit. "They may be indistinguishable from their features, but the genuine one has a *history* of production at the Royal Mint, and the fake exemplar is coming from some shady workshop. There might, however, be some traces of production, which could be detected by an expert, so if I own them both it would be wise to keep them apart. That could not be done by reference to features, of course, but if I

³ The reason why we think that we can identify objects by solely sensing them, is that we are not aware of that we or others already have selected and framed them in their numerical identities when we are sensing them as unique and concrete objects

remember in which pocket I put the one and the other I could manage the identifications despite the equality of the coins' qualitative identity" (Mammen 2017: 50).

An interesting question is, that if the pocketing fails and we mix up the coins, are they then still different even if we cannot see any difference in their appearances? If there is a difference, then it has to do with the numerical or historical identities of the coins.

The interesting thing about this 'simple' example is that humans are able to relate to the historical depth of human relations being-in-the-world. This specific human form of relationship generally constitutes the basis of the ideal or the spiritual (as in the example with loss and grief). The ideal objective aspects of reality (its historical meanings) we can only acquire in a community within our social and societal relations.

The human sense of the concrete - especially the ability of following objects as concrete matter in their continuous threads in time and space - is a prerequisite for our capacity to accumulate and communicate empirical knowledge of e.g. laws of nature. It is this 'human sense', which make it possible to pursue science and make generalizations beyond facts in common sense and more systematically in research. Mammen presents an illustrating example of this by Gregor Mendel's famous pea-experiments in 1866: "Mendel stresses the decisive importance of securing the *threads of descent* of the plants, not by describing them, but by keeping track of their positions, their exposure for germs and spores, and noting their history of descent through at least three generations, which can't be deduced from their features. With these threads of descent, secured independent of features, Mendel could, on this background as a frame of reference, interpret the patterns of changed and not changed features, as an expression of the underlying otherwise concealed genetic *laws* (Mammen, 1996)" (Mammen 2017: 48).

With the choice and sense categories, we have gained a theoretical and analytical distinction crucial for psychology (and mathematics).

Some Critical Remarks

We find Mammen's distinction between the sense categories and the choice categories of great significance as fundamentals for a theoretical psychology.

However, the qualitative differences between animals and humans regarding the duality could be more evident. We suggest that it could be more distinct, where we can find a qualitative leap or a line of demarcation between animals and humans regarding the dual relations to the world, and how the human sense emerged.⁴ We find that without a clear-cut line of demarcation, it is difficult to show fundamental differences between animals and humans regarding how they relate to their world.

Still, it appears that Mammen has caught some basic and significant differences between animals and humans in his description of 'the human sense'. Especially that humans are able to maintain lasting relations to objects as particulars as such and recognise and identify them in their unbroken trajectories in time and space beyond and

⁴ Mammen states, that "These questions of the concrete and detailed *emergence* of the "human sense" as a specific elaborated form of the duality already found in animals' life are not central. What is central is that after the introduction of the specific human duality in relations to the world of objects, a new *structure* is found in these relations" (Mammen 2017: 43)

independent of all changes regarding their properties. And even though it can be discussed, if the ability to follow and identify objects in their historical depth are differences in kind or degree between animals (mammals) and humans, the animal sense is not what Mammen names a ‘scientific sense’.

Catching up with Aristotle

From a historical materialistic and dialectical understanding of development, Engelsted has further developed Aristotle and Leontiev, including an understanding of how Aristotle’s steps from a vegetative psyche to three steps of animal psyche can be understood as a result of a concrete evolutionary development.

Engelsted’s starting point is the question: How did Psyche get into the world? The presupposition is that Earth evolved from a material substance into biological systems and living substance. At some point in time and space psychological life emerged. To understand these new phenomena, Engelsted wants to understand its origin - as it appears in its most general form. The book is divided into two main parts where part I is primarily about the history of psychology and part II is primarily about the history of psyche.

We are introduced to Aristotle’s concept of soul or psyche. Aristotle held that studying the psyche (‘form’) is only possible if we study its material embodiments (‘matter’). Declaring psyche to be form, Aristotle made the psyche an expression of and inseparable from the material body. This was as far as we know the first time psychology was founded as a natural science. Defining all forms of biology and psychology psyches, Aristotle had also identified the defining unit of psychology. Engelsted argues that Aristotle’s taxonomy is a general psychology, laying out the architecture of the psychological domain from the simplest animal functions to the unique human traits. At the most fundamental level: Food intake and reproduction (all forms of life); then the ability to move about and to sense (lower forms of animal life); then the ability to imagine and have dreams during sleep (all mammals), and at the top level the human being with the ability to think and speak, and to live in a society.

Engelsted tells the story of philosophy and psychology from Aristotle to Franz Brentano (1838–1917) as a continued attempt to place the psychological in the natural world and - after Galilei - within the bounds of physics. The great disruption in this story is the Aristotle-Galilei breach, and it is argued that in order for psychology to be whole, general psychology must bridge this breach, giving Aristotle and Galileo each their own right. Aristotle had over-generalized and made everything biological, whereas Galileo had over-generalized and made everything just physical.

The distinction between Aristotle’s active quality of life and Galilei’s reactive causality can according to Engelsted be seen as a distinction between Activity Theory (AT) and Reactivity Theory (RT).

Engelsted divides the psychological domain into four epistemic subdomains: the *sentience* of the living being, the *intentionality* of the animal being, the *mind* of the mammalian being, and the *consciousness* of the human being.

Sentience is the ability to sense and have sensuous awareness, i.e., awareness of presence. It is an original feature of the living cell and presumably common to all life. Engelsted argues that sensory awareness is a weird conundrum and therefore suggests

leaving this question in the world of quantum mechanics. Thus, we focus on the following three subdomains.

Although the explanation of the qualitative leaps from one level to the next is crucial in Engelsted's work, we mainly present the outcome of the subdomains, and not the journey through the in-leaps-evolution: life, animal life, mammal life and human life.

The First and Second Animal Level of Psychogenesis - Intentionality and Mind

The second subdomain and first animal level is *intentionality*. The animal life is distinct from plant life - the key difference is the necessity of animals to move in order to find food. This involves locomotion as an essential aspect and the core principle of development of psyche as epistemic relationships. Living beings can only exist if they are regularly sustained by an outside source of energy, and it is argued that the self-initiated locomotion toward the food brings intentionality into existence (Fig. 1).⁵

A common understanding of the cause of animal locomotion is Stimulus-Response (S-R), but although animals do react to certain stimuli, they do not wait to move until they are 'hit by stimuli'. Engelsted argues that the S-R framework can only explain the animal's causal reactions and not its intentional activities. Food is out there somewhere, but there are no stimuli to set it into motion. The only possibility to reach the food is self-initiated motion - not because it 'wants' to reach the food, but because the ability for self-movement is developed. As it is explained: "*All animals are able to move spontaneously, i.e., under their own power and volition, and this enables them to re-connect with food, when contact has been lost*" (ibid. p. 43).

This aspect of the animal's activity - the existential reaching out into the unknown - is what Engelsted defines as psyche.⁶ Expressed in terms of the relation between a subject and an object, the subject must move in the 'hope' of finding the object in a search-and-find strategy.

From an observational point of view a movement is a movement, but there is a crucial distinction between movement as a causal response to a stimulus (Galilean causality), and movement taking place intentionally towards a goal (Aristotelian teleology). Engelsted here suggests distinguishing between '*interface*', where the connection is causal and physical and equivalent to S-R, and '*interspace*' where the connection is intentional and based on the subject's locomotion. The animal is not only living in an interface relation with its proximal surroundings, it is also living in an interspace relation with distal objects.

Figure 1 shows how locomotion through (and at the same time creating) the interspace between organism and an object, passes through four distinct stages, creating four different relations to the object: When the food object is out of contact the activity of the organism is by definition (1) *searching*. Here, the object is 'out of sight', but appears as '*intention*' or 'hope' implied in locomotion. When the animal gets into contact with traces of the food, and picks up the stimuli from it (e.g. a chemical), it starts (2) *tracking*. Here the object is 'out of touch', but appears as *information*. When

⁵ This intentionality is in its first form not a 'willing' intentionality, but an 'enactive' (Bruner 1990) mode of intentionality inherent or immanent in the very locomotion as a 'striving' towards a future goal. An intentionality as something a subject wish to do is a later evolutionary developmental consequence of this original locomotorical intentionality.

⁶ Reaching out in space the animal is hereby forming a pattern of epistemic relations, the psycho-logic








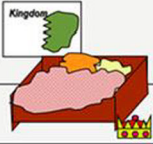








THE UNIVERSAL PASSAGE THROUGH INTERSPACE			
1  <i>Out of contact</i>	2  <i>Distal contact</i>	3  <i>Close encounter</i>	4  <i>Union</i>
SEARCH	TRACKING	HANDLING	CONSUMPTION
			
			
			
Object as INTENTION & HOPE <i>Uncertainty reigns</i>	Object as INFORMATION <i>Ambiguity reigns</i>	Object as OBJECT OF ITS OWN (Gegenstand) <i>Intractability reigns</i>	Objekt as VALUE & CONFIRMATION <i>Failure threatens</i>
Existential psychology	Cognitive psychology	Behavioral psychology	Humanistic psychology

Fig. 1 Reprint from Engelsted (2017: 45), with the addition of the theories in the last row in accordance with Engelsted's Fig. 13.1: Atlas of general psychology (Engelsted 2017: 118)

the animal gets into direct contact with the food it starts (3) *handling* it. Here the object appears as a ‘*thing of its own*’ with the ability to stand up against the subject and offer resistance (‘*gegenstand*’). The last stage is (4) *consuming*, where the object takes the form of confirmation and *value*, and the whole sequence receives its final satisfaction or disappointment. Hereafter the events can start again.

In the course of events both the Aristotelian final cause and the Galilean effective cause, is enrolled in such a way that Engelsted's subject-object relationship becomes a concrete dialectical relationship.

In fig. 1 the basic domain of psychology is represented by an unicellular organism's intentional activities. With regard to the rabbit and the boy in the figure, the basic domain is elevated to new levels of phylogenetic development in such a way that, although transformed into very different qualities, the basic structure and epistemic relationships of the basic domain are eliminated *and* preserved (elevated) in a dialectical way in new qualities in the following subdomains.

Search and consumption define intentionality as ‘teleological striving’ and a frame of goal-oriented activities for the middle two stages: tracking and handling which are the *functional means* of accomplishing the *intentional goal* of the activity. Each of the

four stages is also recognized in the major historical fields of psychology; the first and last stages are recognized as existential and humanistic psychology and the intermediate stages are recognized as cognitive and behavioural psychology.

The majority of psychology has been about the intermediate stages named the *psycho-logistic*, where Reactivity Theory's (RT) rules and algorithms are applicable. This is reasonable, Engelsted argues, as long as we do not lose sight of the *psycho-logic* (Engelsted 2017: 59).

Mind is the second animal level and the third subdomain of the psycho-logical. Engelsted makes it a specific and defining feature of the mammals. It is argued that mind has capacities of emotion, memory and representation. Mind becomes an inner scene with memories that brings the past into existence as well as the ability to plan for the future. As *the present moment* came into being with sentience, and *the future* with intentionality, *the past* comes into being with mind. *The view 'from the outside'* comes into being with consciousness, which is the subject for the next paragraph.

There is a special focus on the distinction between mind and the psycho-logical. It is argued that "... mind is basically the intervening variable between stimulus and response (s—>o—>r) ..." (ibid: 50), and this is not itself the psycho-logical. The psycho-logical is a relation in the world, which in mind is represented as an 'internalized relation-in-the-world'. The content comes from the world, only it is moved into a different medium, i.e. the subject/object relationship is internalized to an "inner scene" as "an inner theatre" of the mind (ibid. 119).

Anthropogenesis - Human Consciousness

Engelsted proposes a new understanding of anthropogenesis. Among many other authors in philosophy and psychology, Marx and Leontiev are mentioned. In accordance with the classical anthropogenesis, they saw tool-use, brain, and social cooperation as the uniquely human features. However, none of these explanations are different in kind, Engelsted argues, only different in degree (e.g. social hunting), and therefore cannot explain the leap from ape to human.

Regarding this argument, it is suggested that the term work has two dimensions: the product produced as in the concept of craftsmanship (named *work*), and the reproductive dimension - surplus labour as a struggle or laborious work (named *labour*). Rather than work or working with tools, Engelsted argues that the 'difference in kind' must be found in the reproductive sphere or surplus labour, i.e. the capability of the worker's production to exceed his consumption.

Some aspects of the explanation goes like this: In the animal world surplus 'labour' exists when a mother gives food to her offspring, but in the human world, excess work gives 'food' to people other than their offspring.

A distinction between a social relation and a societal relation is essential here. In a social relation, the principle of symmetry and reciprocity applies (S1-S2), i.e. to be in need of another participant, who in turn is in need of you. A societal relation is an asymmetric and non-reciprocal labour activity where one contributes (S1 =>) and another receives (= > S2). In nature, we only find this relation in parental care, while in society this is a universal human quality that explains the human form of societal existence. Insisting on a difference in kind, it is argued, it does not rest with the social, but with the societal, making economy the special human ecology.

How animal parenting could turn into human surplus labour is told in a fascinating scenario - linking it to a division of labour between hunters and gatherers and between genders. We will leave this experience to the reader of the book.

In human life, the object can be ‘a part of me’ and something ‘apart from me’, my thing and a thing of its own (e.g. when products of labour is given away to a generalized fellow human being).

Humans can “keep the object inside the hand (subjectively) and at the same time look at it from an outside position (objectively). Appropriately, in the context of the Adam and Eve story, the latter has been called ‘*the God’s Eye View*’ (Engelsted 2017: 97).

The new double sense that allowed humans to view themselves from both the inside and the outside codefines the human being together with societal living, which beside evolution is the beginning of a new form of development, which we call history.

Language is part of that history. Signs or words have meanings that need interpretation unlike signals that are sensory and make immediate local sense. Signals such as ‘food’ is transformed into mediated signs, which exceed the here-and-now-situation. In addition to words, artefacts also have built-in intention and meaning (‘mind products’). Makers have intentions making tools and products, and externalizing what the makers had in mind, the production of artefacts creates a world of mind-products, that surround humans everywhere. Linguistic meanings are rooted in the material production (in the mind products’ built-in intentions). Moreover, man-made products in the collective production and the like are not made for the workers to use, but for the benefit of someone else, thus surplus labour - and other interest - is also at play here.

Some Critical Remarks

The transitions between the different stages in the evolution of animal life is not elaborated in greater depth in this book, presumably because of limitations due to the scope of the book, but Engelsted has thoroughly elaborated this elsewhere (e.g. Engelsted 1984, 1989a, b; Mammen and Engelsted 2000).

It may be for the same reason that it is difficult to find some differences between sentience and sensing - if there are any differences at all. We may suggest that sensing is an *active sentience* in the locomotory activity facing the world, i.e. sensing is a transformation of sentience in the leap from the reactive first forms of organisms to the active animal organisms facing the world by the intentional locomotion. In this sense, we understand intentionality as the first stage in the evolution of animal life.

Epilogue

The aim of Jaan Valsiner’s new Springer Briefs Series—Theoretical Advances in Psychology new series, “... is to give the international and interdisciplinary readership direct access to specifically theoretical innovations that can be found in the field” (Valsiner, in Engelsted (2017): v). We find that the books of Engelsted and Mammen more than fulfil the mentioned aim bringing some radical new theoretical innovations to psychology.

In the project of ‘naturalizing the psyche’, both authors propose that psychology has to be defined based on what is specific for life compared to the non-living nature, and what is specific for animal life compared to life in general. We will suggest that the missing ‘figure’ in Koch and Leary’s “jumbled hidden-figure puzzle” is Engelsted’s “four corners of the puzzle”: sentience, intentionality, mind, and consciousness that together with Mammen’s categories constitutes the domain of psychology. This is possibly the first time in the history of psychology, that the specific domain of the science of Psychology is identified and delimited as a concrete domain among other domains in the division of labour within sciences.

The organisms’ actively reaching out toward their vital objects, described by Engelsted as a simultaneous connection and separation between subject and object on one side, and as the objects’ numerical and qualitative identities as a dual relation described by Mammen on the other side, is basically the same double relationship between subject and object. Objects have this dual existence in nature, but until the human being, animals could have no awareness of this (Engelsted 2017: 97).

Engelsted examines the dual relationship’s genesis and further development from the simplest organisms to humans, whereas Mammen examines the same relationship and describes the topology of our relations to our world (the societal ecology) with help from modern mathematics. In his 1983-thesis on the logical structure of psyche (Mammen 1983), he thought, that only the sense categories were applicable for both animals and humans, and only humans had the ability to keep track on the numerical identities of objects.

To put it simply, Mammen’s movement has been analytical crawling downwards the evolutionary ladder from humans to the first forms of psychic life (and further ‘down’), where he got the insight, that both of his categories were valid for all psychic life, while Engelsted has followed the opposite synthetic way climbing upwards the evolutionary ladder, where he discovered how he could incorporate Mammen’s categories into his theory.

Thus, we can say, that the two general theories inspire, enrich and complement each other, and this makes an attempt to integrate their views and theories both exciting and challenging. It is an ongoing task, so here we only mention a few possible connections.

Mammen’s understanding of the human sense of the concrete is essential in order to understand human knowledge. As Engelsted stresses only humans can look at the object subjectively (from the inside) and at the same time objectively (from an outside position) (2017: 97). Thus, we prefer to talk about ‘*Human’s Eye View*’ rather than ‘*God’s Eye view*’ as a prerequisite for human common-sense knowledge as well as the possibilities to accumulate and convey scientific knowledge. The human’s eye view is a view from and by means of ‘the historical depth’ of development of the human sense of the concrete, i.e. the ability to see the object as it is by itself (‘das ding an sich’) (cf. Mammen’s example of Mendel’s pea-experiment).

Focusing on the basic domain of psychology, we can illustrate some possible aspects of integration of the two theories.

Figure 2 illustrates the ontological model of the relationship between the intentional and the functional aspects of a subject’s concrete activities. The two different aspects of

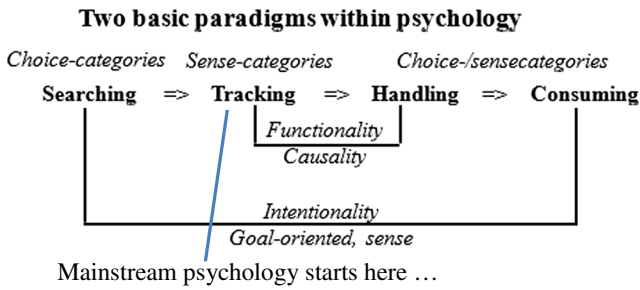


Fig. 2 Two basic paradigms within psychology: a causal and a meaning psychology (modified and expanded from Engelsted (1994))

the subjects activities are integrated as a course of events within the frame of goal-oriented activities (the stages in Fig. 1), where Tracking and Handling only make sense by virtue of the goal of the activity.

Mammen's selection (existence) and sensing (appearance) is placed in fig. 2, which is a model of Engelsted's basic domain of psychology, where searching is a 'pure' choice category, tracking a 'pure' sense category (i.e. as an tracking based on intentionality), and handling/consuming can be described with both choice- and sense categories in combination (where the combination (intersection) of the two categories in accordance with Mammen's axiom 11 is a choice category). In other words, the intentional and choice categorial search activity constitutes the framework (the goal) of the activity's functional means, which therefore is subordinated the subjects goal-oriented framing of the activities.

The fact that the functional aspects of the subject's activities are subordinate the intentional framing of the activities explains how the relationship between psyche and brain can be understood. Figure 2 illustrate, that 'Tracking' is developed as a result of and get it's meaning from the intentional framing of the psycho-logical relationship. The first sensory organelles that the organism can use for tracking are further developed during a very long time of evolution into sensory organs, nerve tissues and brains. This means that sensing (and perception, insight and conscious insight) and brains, i.e. the cognitive moments of the psyche, are the result of the subject-object (psycho-logical) relationship, why psychology is the key to understand the brain processes and not vice versa, as the relation is usually understood, in e.g., the cognitive sciences.

Unlike the animals, humans are able to separate and recognize each of the four phases in themselves, and that is why it is possible to develop theories about each of the phases more or less independent of the other phases in the course of events (see the last row in Fig. 1). This is an example of how the identification of the domain of psychology can say something about the connection between main theories in relation to the domain - one of the core tasks of general psychology.

Besides the values brought by the individual specific theories, we are also able to see their interrelations and their overall scope of validity, which become visible as they are theories about each of the phases separated, but now understood in their real connections in the actual sequence of events in the activity of a concrete organism. We can by means of Fig. 1 and the general theory understand how the specific theories concerning

the basic domain relate to one another in a meaningful and coherent whole with the course of events as a (dramatic) narrative.⁷

The outline of the domains in psychology in principle offers a substantial and promising contribution to solve - or rather ‘dissolve’⁸ - at least some of the essential dualisms, especially the S-O-dualism. Hereby we can begin repairing some of the schisms and fractures in the fragmented contemporary psychology, which the crisis of psychology was about.

Besides the subject-object and psyche-brain dualisms, we can shortly present a couple of other examples, e.g. the psycho-physical dualism of Descartes and psyche understood in an inner/outer-dualism.

We should be grateful for Descartes’ identification of the “two substances” as real substances in the world. From an abstract, analytical and distorted expression of reality, however, Descartes’ separation of “*res cogitans*” without extension (referring to the human soul), and “*res extensa*” with spatial extension (referring to the mechanistically defined physical world) is rather problematic.

From a logical theoretical consequence of Mammen’s categories and a practical theoretical consequence of Engelsted’s theory, Descartes’ substances become turned upside down. Mammen argues: “You just have to *interchange* or “switch” the couplings. The basis of mechanicism is infinitesimal, atomistic, and *proximal* interactions. The basis for psyche is *distal* intentional relations. It is no wonder philosophy has had problems since Descartes, when the basic concepts have been turned *upside down*” (Mammen 2017: 44).

Following the turnaround of Descartes’ dualism, it may be possible to start over again, almost 400 years after Descartes, and understand *Res Cogitans* as the specific *Res Extensa*, which is the epistemic relation in the ecological world of animal life.

By means of the description of the evolutionary development of Engelsted’s three stages of the psychology’s domain, we can see some connections regarding the internal and external forms of psyche, and hence some potential possibilities to dissolve the inner-outer-dualism in psychology:

(1) The first psycho-logical relation is an *external relation* of the organism’s being-in-the-world (external psycho-logical relation in animal interspace). (2) This external relation is internalized as an *internal relation* in the mind of mammals (external/internal relation in mammal social world). (3) The internalized relation is through human productive activities *re-externalized as mind-products* (external/internal/external in the human societal world) (Engelsted 2017: 118 (Fig. 13.1 Atlas of general psychology: the basic structure of psychology)).

The theory shows that these kinds of dualisms can only be dissolved through a concrete historical and dialectical approach to the study of the evolutionary developmental stages from the first animal organisms to humans, i.e. by following the

⁷ According to Aristotle this course of events can be understood as a narrative, which has a beginning and an ending and ‘something in between’.

⁸ Dualisms can be seen as preliminary analytical and abstract expressions of aspects of reality, which can be dissolved in a dialectical, synthetic and concrete understanding of the relationships.

developmental stages in the concrete evolutionary process as ‘*die Gang der sache Selbst*’ (Hegel).

Mammen has found a bridge between the existential and functionalistic domains of psychology via the formal domain of mathematics - and Engelsted has established this bridge by his phylogenetic method in his psychogenesis.⁹

The integration of the theories pave the way for the understanding of how the domain of psychology originate from the nature and therefore how it is compatible with and simultaneously qualitative different from the domains of natural sciences. This is a prerequisite for dissolving some of the dualisms and create a dual coherence in the current fragmented psychology, based on one side on functionality and on the other side on intentionality.

Mammen’s and Engelsted’s discoveries were developed many years ago in Denmark, and we welcome greatly Valsiner’s series, which also allows researchers in the scientific psychological community abroad to discover the discoveries.

In our view, the theories may constitute some basic and pivotal theoretical cornerstones in the foundation of an upcoming scientific psychology.

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All works of Jens Mammen and Niels Engelsted before 2015 can be downloaded freely from: <http://engelsted.net/Indhold.htm>

⁹ An interesting aspect of the integration of the theories is, that Mammen’s theory about the objects’ dual properties is the world, which potential upcoming organisms will find, if or when they relate to the objects. That is, the theories in combination illustrate, how the world opens itself for the first animal organisms who open themselves to the world by their active relating to the objects’ dual properties. Elaborating on such considerations may contribute to a sort of *basic phenomenology*.

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