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REGULAR ARTICLE

Travel Into a Fairy Land: A Critique of Modern Qualitative and Mixed Methods Psychologies

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Abstract In this article modern qualitative and mixed methods approaches are criticized from the standpoint of structural-systemic epistemology. It is suggested that modern qualitative methodologies suffer from several fallacies: some of them are grounded on inherently contradictory epistemology, the others ask scientific questions after the methods have been chosen, conduct studies inductively so that not only answers but even questions are often supposed to be discovered, do not create artificial situations and constraints on study-situations, are adevelopmental by nature, study not the external things and phenomena but symbols and representations—often the object of studies turns out to be the researcher rather than researched, rely on ambiguous data interpretation methods based to a large degree on feelings and opinions, aim to understand unique which is theoretically impossible, or have theoretical problems with sampling. Any one of these fallacies would be sufficient to exclude any possibility to achieve structural-systemic understanding of the studied things and phenomena. It also turns out that modern qualitative methodologies share several fallacies with the quantitative methodology. Therefore mixed methods approaches are not able to overcome the fundamental difficulties that characterize mixed methods taken separately. It is proposed that structural-systemic methodology that dominated psychological thought in the pre-WWII continental Europe is philosophically and theoretically better grounded than the other methodologies that can be distinguished in psychology today. Future psychology should be based on structural-systemic methodology.

Keywords Epistemology · Qualitative research · Quantitative research · Mixed methods approach · Structural-systemic methodology

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> [...] it seems to me that this theory of the universal energy and operation of the Supreme Being, is too bold ever to carry conviction with it to a man, sufficiently apprized of the weakness of human reason, and the narrow limits, to which it is confined in all its operations. Though the chain of arguments, which conduct to it, were ever so logical, there must arise a strong suspicion, if not an absolute assurance, that it has carried us quite beyond the reach of our faculties, when it leads to conclusions so extraordinary, and so remote from common life and experience. We are got into a fairy land long ere we have reached the last steps of our theory; and *there* we have no reason to trust our common methods of argument, or to think that our usual analogies and probabilities have any authority. (Hume 1999, p. 142).

Critique always originates from certain assumptions and background theory or perspective. Critique, in order to be relevant and meaningful, requires explication of this background. In this article the critique of modern qualitative and mixed methods is based on certain views on what is science, what is scientific method and methodology, etc. Each of these fundamental notions can be understood in different ways and the particular perspective that underlies the present critique may be controversial. Therefore the arguments against modern mainstream qualitative and mixed methods approaches proposed in this article can be challenged at two different levels of analysis—these arguments can be questioned either in the framework of the proposed background theory or the background theory itself can be questioned. Discussion of all theoretical notions would require a series of articles. This article primarily aims at the discussion of scientific methodology.

In this article, science is understood as a way of constructing knowledge about the world; science is distinguished from non-scientific ways of knowledge construction by its method. The essence of scientific method is not a list of techniques used in the process of knowledge-seeking. Scientific method is essentially a special way of thinking about the world; scientific techniques are always planned—primarily they are thoughts and only secondarily actions, which are implementations of scientific thought. Two complementary aspects of scientific thinking should be distinguished. According to Vygotsky, for instance,

> G. P. Zeljonyi points out correctly, that with the word "method" [*metod*] two different things are understood by us: 1) method [*metodika*] of study, a technical action [*prijom*] and 2) methodology [*metod*] of cognition [*poznanije*] that determines the aim of a study, the place of a science and its nature. (Vygotsky 1982, p. 346, my translation)

Put in another way, science is a way of thinking that is focused simultaneously on the phenomenon studied *and* on the way of thinking about the study (Toomela 2010c).

Of these two aspects of scientific thought, the general way of thinking—methodology—is primary because all methods are constructed in concordance with methodology and not vice versa. It does not follow, however, that scientists always consciously and rationally rely on methodology when constructing methods. "Methodological blindness"—ignoring methodology that underlies methods—eventually leads to mismatch between methods and questions that are supposed to be answered with the help of them; the methods are not appropriate for achieving the

answers that are searched for. I suggest that psychology today largely relies on methods that cannot lead to scientific understanding and explanation of the studied things and phenomena. Before discussing methodological problems with quantitative and qualitative approaches to psychology, some central notions must be defined.

Understanding, Explanation, and Scientific Knowledge

Science aims at knowledge that explains and leads to understanding of the phenomenon or thing under study. As it will turn out below, there are different views—sometimes explicit but more commonly implicit—on what are scientific knowledge, explanation, and understanding. These views, in turn, are directly related to methodologies of scientific approaches.

Relevant for the purposes of this article definition of scientific knowledge was proposed by Aristotle. According to him, scientific knowledge is knowledge about causes of a thing (Aristotle 1941). There are several theories of causality; the relations of those theories with different scientific epistemologies have been discussed in more details elsewhere (Toomela 2010g, 2011). Briefly, first, there is a world-view based on Heraclitian thought. According to that view, the world is characterized by constant change in boundary-less continuous unity; all events are multiply determined but the essence of such determinations is not possible to reveal because there are no clear boundaries between things, events, phenomena. Qualitative methods are used by followers of this epistemology. Next, the most dominant perspective on causality in today's psychology assumes that there is one kind of causality, that of efficient causality. This world-view, which originates from Cartesian-Humean philosophy, underlies quantitative approaches to the study of psyche. Finally, there is Aristotelian structural-systemic world-view, according to which scientific knowledge is knowledge of the structure of the studied thing or phenomenon: what and in which specific relationships are the distinguishable elements that comprise a whole with emergent qualities. Methods used in structural-systemic science are also only qualitative.

In the present article, it is assumed that understanding and explanation is achieved with structural-systemic description of the studied thing or phenomenon because this kind of explanation contains the knowledge obtained in the other two as well as qualitatively novel kinds of knowledge that are not sought for by the approaches based on the other two epistemologies (Toomela 2011). Scientific knowledge, therefore, contains knowledge about the relationships between events or things *and* about what the thing is, i.e., what is the structure of the thing. Not all methodological approaches are appropriate for achieving scientific knowledge defined in this way. Fundamental limitations can be recognized through the analysis of methodologies and methods of scientific approaches.

Status of Quantitative Methodology

Psychology today largely follows methodology implicitly. This is especially true about that part of psychology where quantitative methods are used. In this research

tradition highly sophisticated mathematical methods are developed for answering scientific questions but the methodological questions are almost never asked. Common questions in this approach are related to the utilization of mathematical tools. Which is the best method for multivariate prediction of group membership? Which estimation method should be used for fitting a statistical model to the data? How the number of factors should be determined? And so on and so forth.

It is usually not realized that, in addition to the methodical questions, there are also methodological questions that must be asked and answered in order to construct coherent scientific understanding of the studied phenomena. The central methodological question to be answered for quantitative psychology is the question about the quantitative methods as such—are they appropriate for understanding and explaining psychic phenomena in principle?

There are substantial reasons to suggest that psychology as a science was more advanced before the World-War II than it is now (e.g., Toomela 2007a, 2008a, 2010d; Toomela and Valsiner 2010). It is also true about methodological thinking in psychology—among other differences, the earlier psychology was not characterized by "methodological blindness." Earlier scholars, even those who introduced statistical data analysis methods into science in general and psychology in particular—Pearson, Poincare, Thurstone, and Spearman, for instance—clearly recognized that statistical data analysis does not reveal the mechanisms, the essence of the studied phenomena. According to such scholars, mathematical tools are used only for man-made generalizations, for prediction without any claim made about the reasons as to the causes that underlie the discovered mathematically expressed "laws" or factors (cf. Pearson 1902, 1904; Poincare 1905, 1914; Spearman 1930; Thurstone 1935, 1948; see also Toomela 2010e).

Serious doubts about the possibility to understand psyche with the help of mathematical tools have also been raised by an increasing number of more recent scholars. Several theoretical analyses demonstrate, from different perspectives and with different arguments, that psychological phenomena may not be measurable and therefore quantitative data analysis often produces only meaningless numbers (Essex and Smythe 1999; Michell 2000, 2010; Sohn 1999; Toomela 2008b; Trendler 2009).

I think the most fundamental problem with application of mathematical models of any kind in psychology is not even the issue whether psychic phenomena are measurable or not. The most fundamental problem is that, following from the essence of mathematics, the scientific inquiry with mathematical tools is turning science upside-down. Instead of asking what the studied phenomenon is, it is asked, what aspects of it fit undefined mathematical assumptions and mathematical rules of deduction. In this way all studied phenomena are conceptually forced into the Procrustean bed of mathematics. The studied phenomenon itself disappears in this process (cf. Toomela 2010e). The studied phenomenon disappears because quantitative methodology is used for studying *relationships* between events and things; it is not—and cannot—be used for understanding what a thing or phenomenon *is*. For the latter purpose qualitative methodology must be followed (Toomela 2009, 2010b, 2011). Quantitative methodology reveals relationships between events; it can discover that certain relationships are regular, appear more often than would be expected by chance. But this methodology does not allow going beyond mere identification of such relationships; the emergence of them is not

explained. Explanation and understanding of the emergence of relationships is based on knowledge of what the studied thing or phenomenon is.

So, there are reasons to suggest that quantitative methods are not appropriate for understanding psychic phenomena in principle. Before going further, it is necessary to mention that quantitative methodology, even though it does not allow understanding the reasons why certain events are (causally) related, is still useful for making generalizations about relationships between events. Through discovering covariations between events, quantitative methodology is very useful tool for prediction and therefore for grounding practical decisions in the situations where no theory is available about what the phenomenon or thing is (Toomela 2010e).

Alternatives to Quantitative Methodology

If quantitative research methods are not appropriate for understanding and explaining psyche, then the only alternative must be based on qualitative methodology. The situation, however, is more complicated. Beside quantitative, not one but three methodological approaches should be distinguished in psychology. First, there is a set of qualitative methodologies that (re-)emerged in psychology about four decades ago. I am going to refer to these methodological approaches as modern qualitative. By this I am not suggesting that these particular qualitative methodologies are something new. On the contrary, epistemological roots of them can be traced back to Heraclitian philosophy (cf. Toomela 2010g, 2011). These qualitative methodologies can be called modern because they are the dominant qualitative methodologies relied upon by psychologists today. Second, there is so-called mixed methods approach; this approach, according to several scholars, is not just a mix of the quantitative and qualitative methodology but rather comprises a third approach that should be clearly distinguished from both qualitative and quantitative approaches (Denscombe 2008; Johnson et al. 2007). And third, there is a distinct qualitative methodology that was especially prominent in the pre-WWII continental European psychology; this approach almost disappeared from psychology around 1950s for no scientific reason (cf. Toomela 2007a). This qualitative approach I have called structural-systemic (Toomela 2011).

In this paper reasons are provided as to why modern qualitative approaches to the study of psyche are even less appropriate for understanding psyche than quantitative approach. At the same time, it turns out that both modern qualitative and quantitative approaches share fundamental flaws and therefore mixed methods approaches cannot overcome methodological limitations inherent to them; mixed methods are also not appropriate for understanding and explanation of psyche.

Fallacies of the Modern Qualitative Methodology and Methods

Modern qualitative methodologies have several fundamental fallacies that do not allow them to ground scientific understanding and explanation in principle. I am going to discuss some of these fallacies without claiming that the list of the problems is exhaustive. It is noteworthy that the field of science that is based on modern

qualitative methodologies is quite heterogeneous. Some of the particular approaches may have only one or two of the fallacies discussed next. Nevertheless, any one of the fallacies would create insurmountable difficulties in developing scientific understanding and explanation.

Before going further, it might be useful to mention that the question is not whether some or all of the modern mainstream qualitative methodologies can be characterized by the problems identified below. I am only suggesting that any of the qualitative approaches that can be characterized by some or all of these problems has also problems in achieving scientific understanding and explanation as defined in this paper. My critique, thus, would not apply to qualitative approaches without any of the discussed fallacies.

Epistemological Problems

Problems begin already with the epistemology that underlies modern qualitative methodology. These problems have discussed in more details elsewhere (Toomela 2010g, 2011). So I will summarize here only the main points and provide some new arguments to ground the conclusions I make.

Modern qualitative methodologies are often grounded in the Heraclitian world-view according to which the whole universe can be understood as a process—universe is characterized by the continuous and constant change. It follows from the concept of continuity that there are no clear boundaries between things, events, or phenomena; instead there is continuous becoming. Another important idea that logically follows from the basic notion of constant becoming is that there are no universals that characterize the world. Rather, there are unique events; the focus of science therefore is on the individuals and particulars.

Such world-view is inherently contradictory. It was shown already by Plato that if the universe would really be characterized by continuous change and becoming then knowledge about that world would also be absolutely impossible for two reasons (Plato 1997). First, the thing under study would change continuously into something else already during the study and therefore there could be no thing any more about which the knowledge was achieved. And second, the knowledge should also be in the process of constant change; the process of change is always a process in which something changes into something else—X becomes into something else, non-X. Therefore knowledge would also be in the process of constant change into non-knowledge in the world of constant change.

Perhaps it could be objected that such epistemology grounds methodologies only in studies of psyche and the social world. Perhaps human mind is so intricate and unique that the idea of constant and continuous change applies only to this complex and self-conscious part of the universe and not to the world of biological or physical. This objection would change nothing. Any knowledge about the psyche, if it were constantly and continuously changing, would still not be possible. The mind would in any next instant be another mind and there would be no object about which the knowledge is formulated. As scientific knowledge is specifically human, the scientific knowledge also would be impossible because it would become instantly a non-knowledge or at least non-scientific knowledge. Altogether, any scientific methodology that is grounded in process-oriented epistemology must be irresolvably

contradictory—either there is constantly and continuously changing world and therefore there can be no knowledge and science or the epistemology itself must be rejected. In fact the latter has happened—epistemological principles are used in rhetoric about the science whereas the methods applied in modern qualitative studies do not correspond to this rhetorical level of narrative. Modern qualitative methods assume that there are non-changing qualities that characterize studied individuals. These methods, in fact, also assume that not everything is individual and unique; there are universal principles that apply to many—language, for instance, is a tool used for interviews in qualitative methodology. It is also used for communicating the results of studies. If everybody is unique in all respects, there would be no interview possible because there would be no communication possible. Communication is an act that necessarily implies universals that transcend unique and individual. Communication also necessarily implies fixedness; if the message would constantly and continuously change, there would be no message but continuous becoming of non-messages.

Process-oriented epistemology, sometimes implicitly and often explicitly, and almost universally in methods based on that epistemology, denies the possibility of structure—or at least the possibility to reveal the structure of the studied thing (cf., e.g., Denzin and Lincoln 2005c). There are sufficiently many convincing philosophical arguments to suggest that rejection of the idea of structure is in principle justifiable. Indeed, it has been demonstrated by many philosophers, including Aristotle, Descartes, Hume, Kant, Hegel, Marx, and Engels, that it is not even possible to demonstrate beyond doubt that the world external to "me" exists. In fact, we must assume it without a possibility to prove. Also, if the external world does exist, it does not follow that this external world is material or organized in a certain way. It can be that there are no structures in the universe. Scientists must, again, assume that the external world is organized in a certain way; otherwise any scientific inquiry becomes meaningless.

In this context, it may be said that those modern qualitative methodologies that are based on Heraclitian process-oriented epistemology, just do not assume that the external world is organized structurally whereas followers of the Aristotelian structural-systemic epistemology assume that universe is structural. What is not recognized by modern qualitative process-oriented researchers is that rejection of the idea of structural organization has fundamental consequences. If there are no "fixed" structures—structures that are at least for some time stable—then the only knowledge about the world can be description of the world as it appears to our senses here and now. There would be no underlying structure that would impose universal constraints on what can happen next.

This leads to fundamental problems for a science immediately because the same observable event in the world can be described in many ways; in fact, it can be described in infinitely many ways. According to structural-systemic worldview, it is the structure of the thing that limits the kinds of relationships the thing can enter with other things-structures. "What can happen next" is qualitatively constrained by the structure of the thing. This constraint also excludes many possible descriptions of events as irrelevant to the construction of scientific knowledge. Only these descriptions are relevant that can be related to the essence of the thing, to its structure. But what happens if there is no constraint on the kind of description that is

relevant for science? The result is obvious—without clearly defined constraints, any description is as scientific as any other; thus there is no truth but endlessly many truths. Consistently with the Heraclitian epistemology, this idea has been expressed by many qualitative researchers (e.g., Corbin and Strauss 2008; Creswell 2007; Denzin and Lincoln 2005a, b; Flick et al. 2004a; Guba and Lincoln 2005). The consequence, however, is not expressed by them—if there are endlessly many equally acceptable truths, descriptions, narratives, then there is in fact no understanding or explanation possible. In case of knowledge, if everything goes then nothing is or can be achieved because knowledge always implies exclusion of possibilities. Furthermore, even the scientific activity itself loses meaning because the only result of such activity will be endless increase in the number of descriptions and equally acceptable explanations. There is no scientific reason to increase the number of examples of the principle, according to which always more descriptions and explanations are possible.

Priority of Methods Over Scientific Questions

Next fallacy that characterizes several modern qualitative approaches (Grounded Theory, for instance, cf. Corbin and Strauss 2008) is the violation of an important scientific principle—questions must come before methods. There are phenomena in the world that are studied by scientists. In the course of studies, new and new questions emerge about the studied phenomenon. In order to answer those questions, appropriate research methods must be used. These methods are not given before questions; they must either be chosen from the available set of methods or created especially for answering particular questions. Already existing methods can be used only when there is clear theoretical ground for demonstrating that the methods chosen correspond to the question. It is scientifically unacceptable, however, to decide first the method of study and only after that what questions will be answered. Other sciences, such as physics, chemistry, or biology, are in constant progress of creating new methods for answering new questions. The most recent and well-known example is the Large Hadron Collider that was constructed for answering several questions that could not be answered with other tools; including answering questions about the Higgs Boson, particle that so far exists only in theory.

The situation is exactly the opposite in many fields of psychology where methods come first and questions are adapted to the methods and not vice versa. Such modern qualitative approaches define a priori that the appropriate methods of study are certain qualitative research procedures. Questions are fitted to the methods. There is no known scientific method that would be appropriate for answering all questions. Therefore, if the methods are chosen before the questions then either certain questions about the phenomenon are never asked—because they cannot be answered by the predefined methods; or the answers to questions are not valid because the methods are used that in principle do not allow answering those questions.

Such practice inevitably leads to scientifically useless research. Here it is important to remember that methods and methodology cannot be separated from the theories about the studied phenomena because we know the phenomenon

only through and in the limits of the methods used in studies (e.g., Toomela 2009, 2010g). Studies that begin with predefined methodology and methods also accept a priori the theory about the studied phenomenon itself for there is always a theory about the phenomena that underlies the methodology and methods. In that case, obviously, no novelty can be discovered because by taking the methods the known theory is also accepted without any possibility to discover that the theory can be wrong. For science, it is a dead end.

Studies Without Questions

Modern qualitative research is related to another common problem. In many cases it is impossible to link research questions to the methods because it is assumed that not only the answers but even the questions do not precede the study but emerge in the process of inquiry. So, for instance, in the Grounded Theory tradition,

> A researcher might enter the field having a general notion about what is desired to study but no specific problem area. (Corbin and Strauss 2008, p. 23)

In general, it is assumed by many modern qualitative researchers that both the answers and the questions are to be discovered by the researcher in the course of the study; research, thus, becomes fully inductive:

> The logic that the qualitative researcher follows is inductive, from the ground up, rather than handed down entirely from a theory or from the perspectives of the inquirer. (Creswell 2007, p. 19)

By agreeing that research is fully inductive, researchers believe they are doing something that actually is impossible. Purely inductive science is impossible because, as was already mentioned above, any phenomenon or event in the world can be described in endlessly many ways. Therefore any person who actually describes some phenomenon has already made a choice to describe whatever he or she is describing and to exclude at the same time all other ways of description as irrelevant from the descriptor's perspective (cf. Popper 1994, 2002). So, the issue actually is whether a researcher has the research questions explicitly or implicitly. In the latter case, the only "discovery" that can be made in research is not about the phenomenon studied but actually about the researcher's unconscious views on the studied phenomenon that are made explicit—or created—in the process of study.

Altogether, modern qualitative approach to science remarkably often rejects any possibility to make justified decisions about the correspondence of methods of study to the research questions. It happens in every case when a researcher consciously chooses the phenomenon to be studied but has no explicit understanding of what is his or her research question. In that case the study that is supposed to reveal something about the studied phenomenon actually turns into a study of researcher's own implicit views on the studied phenomena. What the results of such studies tell about the studied phenomenon is impossible to distinguish from the researcher's beliefs, values, and attitudes. Again, in such research (implicit) theory actually precedes the study and no true novelty can be discovered.

Limited Kinds of Methodical Procedures—No World Beyond Appearances

Modern qualitative approaches seem to rely on a wide range of methods. These methods include interviewing; direct observation; the analysis of artifacts, documents and cultural records; the use of visual materials; and the use of personal experience (Anfara and Mertz 2006; Corbin and Strauss 2008; Creswell 2007; Denzin and Lincoln 2005c; Flick et al. 2004b; Silverman 2007). Despite the wide range of methods, modern qualitative methodologies, with a very few exceptions, apply a constraint on its methods that rules out any possibility to discover what the thing or phenomenon under study is, i.e., what is its structure. This constraint, thus, excludes the possibility for scientific explanation and understanding.

Modern qualitative research is, among other principles, based on the idea that phenomena can be understood only in the natural conditions where they occur. This idea, however, might be fundamentally wrong. In fact the opposite corresponds to the current understanding of scientific methods and methodology in physics, chemistry, biology, and some part of psychology as well—in order to understand a thing or phenomenon it *must* be studied in artificial situations. This idea was well-known to the continental European psychologists before the WWII; to the psychologists who, with extremely rare exceptions, relied on qualitative methodology in their studies. Kurt Lewin, for instance, suggested;

> As long as the scientist merely describes [...] he is open to the criticism that the categories used reflect merely his "subjective views" and do not correspond to the "real" properties of the phenomena under consideration. [....] The "reality" of that to which the concept refers is established by "doing something with" rather than "looking at," and this reality is independent of certain "subjective" elements of classification (Lewin 1997, p. 304).

Similar idea was expressed by another eminent qualitative psychologist, Lev Vygotsky. According to him,

> It may seem that analysis, as well as experiment, distorts the reality—creates artificial conditions for observation. From that emerges the requirement for the closeness to the actual life [*zhiznennost*] and naturalness of the experiment. If that idea goes beyond the technical requirement—not to scare away that, what we are looking for—leads to an absurd. The power of analysis is in the abstraction as the power of experiment is in artificiality. Pavlov's experiments—the best example: for the dogs it is *natural* experiment—they are fed etc.; for the scholar it is top of artificiality: saliva is excreted by scratching a certain location—combination unnatural. In the same way, also, destruction is needed in the analysis of a machine, mental or real damage to the mechanisms; to the aesthetic form—deformation (Vygotsky 1982, pp. 406-407, my translation).

Why so? Why, contrary to intuition, a phenomenon can be understood only when it is studied in "ecologically *in*valid" situations? (It does not follow that ecologically valid observations should be replaced by artificial study conditions.

Rather, both kinds of studies are necessary.) Answer to this question was also proposed by Lewin:

> Science tries to link certain observable (phenotypical) data with other observable data. It is crucial for all problems of interdependence, however, that [...] it is, as a rule, impracticable to link one set of phenotypical data *directly* to other phenotypical data. Instead, it is necessary to insert "intervening variables" (Lewin 1999, p. 32).

The reasons why such "intervening variables" are necessary, were also well understood by qualitative researchers of the past—externally similar behaviors can be based on internally different mechanisms and vice versa, externally different behaviors may stem from one and the same underlying mechanism (e.g., Koffka 1935; Lewin 1935; Vygotsky 1996; Vygotsky and Luria 1994). In this context, it is especially noteworthy that the same pre-WWII qualitative researchers explicitly supported the structural-systemic epistemology; for them explanation and understanding was achieved when the structure of the studied phenomenon was revealed (Koffka 1935; Köhler 1959; Vygotsky 1994). Thus, the problem can also be expressed in this way: different psychic structures may underlie externally similar behaviors and the same psychic structure may underlie externally different behaviors.

These ideas are fundamentally important for methodology and methods of psychology that aims at understanding the structure of psyche. If different structures may underlie similar behaviors, the behavior cannot be unequivocally interpreted in terms of psychic structures that underlie it. Also, observation of externally different behaviors cannot ground interpretations in terms of underlying structures—it is not unequivocally clear whether behavioral differences stem from differences in psychic structures or not. The other possibility is that the psychic structure is the same but behavior is different because the external situation has been different. The situation is further complicated with the problem that the environment in which a person is, is always interpreted by that person. Therefore even if for the researcher the environment seems to be "the same," it can be qualitatively different for different persons or even for the same person in different occasions (cf. Koffka 1935).

Artificial constraints on the study-situations are necessary for revealing psychic structures that underlie behavior. According to the structural-systemic theory, structure determines the potential relationships into which the structure can enter; no thing can become into relationship with every other thing in the universe, there are always qualitative constraints on the possible relationships. Here is the reason why and how it is possible to discover hidden from direct observation structure of psyche or any other thing or phenomenon. If persons with different psychic structures behave similarly in certain situations then, in order to reveal structural differences, the same persons must be observed in different situations. If behavioral differences emerge in novel situations, structural differences can be suspected. This is necessary but not sufficient. There will still be problems to be solved.

First, all situations, all environments are very complex. Individuals interact with their environments so that many aspects of it are simultaneously involved in determining the behavior at any given moment. It is possible that persons respond to different aspects of the environment and differences in behavior emerge because of this and not because of the differences between individuals themselves. Thus,

artificial constraints on situations become inevitable; the study situations must be constrained so that it would become possible to reveal, what particular aspects of the environment a person is interacting with.

Second, identification of structural differences is actually the beginning of studies, not the end. Individuals must be further studied in order to discover what psychic structures exactly are involved; what psychic elements in what relationships underlie behavior. Structure of psyche can be understood only with the help of artificially constrained studies of development. This issue will be discussed in some more details in the next section.

And third, it is not only the study-environment that should be artificially changed. From the structural-systemic perspective, "Psyche is a system of processes that, on the basis of individual experiences, organizes behaviors with the aim of maintaining the equilibrium of the organism as a whole in a changing environment." (Toomela 2010f, p. 10; see also Hobhouse 1901; Toomela 2010g). So, psyche, by definition, is based on individual experience, i.e., it changes structurally in the interaction with the environment. By artificially changing environment, it is possible to elicit changes into the structure of psyche of the studied individual. Without artificial constraints on the situation, it cannot be understood, what exactly in the environment corresponds to changes that took place in the structure of psyche in the process of the interaction with the environment for the reason already mentioned—environment is immensely complex and without artificially limiting that complexity, the processes of change can also not be understood.

Altogether, structure of psyche—because it is hidden from direct observation and because it is not in one-to-one correspondence with the behavior—can be understood only with the help of studies that introduce artificial constraints into the study situations. Definitely the final aim of studies would be understanding the studied thing or phenomenon in its natural environment. But it is impossible to achieve such understanding when studies are conducted only in such environments. Artificial, theoretically constructed constraints on situations are not just feasible, they are absolutely necessary for achieving scientific understanding and explanation. Modern qualitative methodologies that are rejecting artificial constraints on study situations reject also the possibility to understand the studied phenomena.

Adevelopmental Nature of Studies

Structural-systemic explanation cannot be achieved without studying development, emergence of novel structures. The reason is that structural explanation implies description of the elements that comprise the whole structure. Properties of the elements of the structure, however, change when the elements enter the whole; properties of the whole become partly characteristics of the elements too. Therefore elements must be studied before they enter the whole. In order to demonstrate that the elements do belong to the whole that is studied, it is also necessary to demonstrate that the hypothetical elements do belong to the whole studied. This can be demonstrated only by studying the emergence of the whole from the theoretically distinguished elements. Therefore the study of development is absolutely necessary for discovering the structure of the studied things and phenomena (Toomela 2009).

Several of the modern qualitative research approaches, however, are essentially adevelopmental. (Parenthetically, consistently with this proposition, there is neither a chapter nor even a term "development" in the subject index of the "Bible" of the modern qualitative research, *The Sage Handbook of Qualitative Research*, Denzin and Lincoln 2005c). Such modern qualitative approaches, with the rejection of the idea of structure, also reject the possibility to understand development as *emergence* of qualitatively novel forms. One of the reasons as to why observation of processes is not sufficient for understanding development is that emergence cannot be distinguished from manifestation—even if the phenomenon can be elicited by a researcher, it is not clear whether the elicited phenomenon emerged or just became manifest.

Quantitative psychology, on the basis of knowledge about covariations between events and efficient causality, provides descriptions of thousands of ways how it is possible to "make the event happen." Even no science is needed for that. Many people know, for instance, that hitting may make the radio or television set to work when these do not work properly. Yet I think majority has no idea as to why hitting elicits the desired result so often. In order to demonstrate emergence, other kind of experiments, I have called *constructive experiments* (cf. Toomela 2011) are needed; these are experiments in the course of which the thing or phenomenon under study is created from the hypothetical elements according to the theory about the structure. If we know how to make a television-set, we know how it works; we have scientific understanding of it. There have been numerous psychological studies demonstrating the effectiveness of constructive experiments in neuropsychological rehabilitation based on Vygotsky-Luria's cultural-historical psychology. In these studies psychic functions that were lost due to the localized brain damage, were re-created by purposeful theoretically grounded set of educational activities (Luria 1948; Tsvetkova 1985; see also Toomela 2011). Purposeful construction, however, is impossible without knowing the structure of the constructed thing.

The Object of Studies: 1

Superficially, modern qualitative methodologies are used for studying some phenomena. It is not unequivocally clear, however, what exactly is studied in many of those research approaches. Some relevant quotations help to locate the problem:

> Objective reality can never be captured. We know a thing only through its representations. (Denzin and Lincoln 2005a, p. 5)
> We have left the world of naive realism, knowing now that a text does not mirror the world, it creates the world. Further, there is no external world or final arbiter—lived experience, for example—against which a text can be judged. (Denzin and Lincoln 2005b, p. xiv)

Or, take one more example, Corbin and Strauss (2008) give a list of assumptions that underlies their approach to qualitative research. The first of these assumptions is:

> Assumption 1. The external world is a symbolic representation, a "symbolic universe." (p. 6)

So, according to such research approaches, text *creates* the world, the world, *is* symbolic representation. Correspondingly, what can be and is studied by researchers

is not the external to the researcher world with the help of symbols as tools but rather the tool itself—the world of symbols—becomes the object of studies.

Such conceptualization of the world, however, leads any science inevitably to a dead end. The problem whether the words or the world should be studied, is old. Already Plato (1997, esp. 438d and 439b; see also Toomela 2011) pointed out that if words are studied instead of the world, no criteria for judging the results of studies can be made: there will be just many different descriptions or names for phenomena. If the verbal accounts disagree, then there is no way to decide which of the descriptions should be accepted or whether all of them should be rejected. Such criteria can be found only when it is assumed that words are just tools that are used for understanding and explanation of the external world. In that case, eventually, words must agree with something outside the verbal sphere, in the external world. This agreement or disagreement grounds the choice between verbal accounts.

It can be admitted here that in some sense modern qualitative methodology is consistent. When it is declared that there is no one truth but many, then now we see why it must be so—the object of the studies does not provide any criteria for selection and all "truths" become equally acceptable. Also it becomes clear, why experiments are rejected—there is just no possibility to conduct experiments because experiment also requires selection of constraints that must be imposed on study-situations. No such constraint can be found inside the world of symbols. Furthermore, together with equating the world with symbols, the distinction between appearance and structure that underlies this appearance also disappears, because in the world of symbols everything is apparent, there is no hidden from direct observation structure that may underlie appearances. With no constraints, however, knowledge is impossible—knowledge always implies the idea that some state of affairs is impossible or at least less frequent than the other. Without constraints, everything is equally possible or plausible and therefore the world becomes totally unpredictable. In the unpredictable world, not only psyche but even life would be impossible, however (Anokhin 1975; Toomela 2010a).

The Object of Studies: 2

There are two more issue related to the study of symbols instead of the world. In actual research practice, modern qualitative researchers often reject the idea that there is no external world but only the world of symbols that is studied. A version of problems related to the object of studies is the implicit assumption that words reflect the reality. This assumption is taken in all cases when answers on interviews, for instance, are taken as reflections of "truth." This is, again, violation of the fact—there are too many examples that support this fact—that externally similar behaviors may rely on internally different structures. This principle applies also to verbal responses in the interviews. The fundamental problem that emerges here is that respondents are not able to reflect on all aspects of their own psyche. Several psychical events are not accessible to our conscious reflection—otherwise there would be no need to study psyche. Therefore unconstrained or constrained by the question alone, responses in interviews are not valid descriptions of the psychical states and characteristics. The same applies to other forms of expression studied by modern qualitative researchers, such as diaries, newspaper articles, opinions

expressed in other channels of mass media, etc. In no cases valid inferences can be made about the psychic processes that underlie the studied expressions.

The same problem applies to researchers themselves; they also have as little access to their own minds. The modern qualitative researcher often has no clear understanding, what exactly is the object of studies—the world or the researcher his/herself. If, for instance, questions are "discovered" in the process of the studies, then this discovery is about the researcher who entered the field of studies with implicit questions. The same applies to all kinds of descriptions—situations, events, photos, etc.; in all cases the researcher has chosen what to describe and regularities that "emerge" in the data interpretation, are categories and principles the researcher very likely had before the study. It may be totally misleading to attribute the results of studies to the studied phenomena because the results may as well represent the subjective and personal characteristics of the researcher instead of the studied phenomena.

Ambiguous Data Interpretation Procedures

Data interpretation procedures in modern qualitative research are often ambiguous. They lack method as a way of scientific inquiry. The ways of doing modern qualitative research have been described as follows:

> How a person does qualitative analysis is not something that can be dictated. Doing qualitative research is something that a researcher has to feel him- or herself thorough. (Corbin and Strauss 2008, p. x)

I can only agree that methods should not be dictated in scientific research—quantitative science violates this principle by first deciding the method and only after the questions. The same problem is characteristic to some approaches of the modern qualitative research as it was discussed above. Indeed, methods of data interpretation cannot be dictated, but it does not follow that they should be totally unconstrained as it often happens in modern qualitative research. Researcher's feelings are the worst guides if the aim of studies is scientific knowledge. Interesting argument against science based on feelings was given by Hegel:

> [...] If a man on any topic appeals not to the nature and notion of the thing, or at least to reasons—to the generalities of common sense—but to his feeling, the only thing to do is to let him alone, because by his behaviour he refuses to have any lot or part in common rationality, and shuts himself up in his own isolated subjectivity—his private and particular self. (Hegel 2008, p. 69)

Hegel obviously could not criticize the modern qualitative psychology; but he mentions characteristics that belong to it. On the one hand, method in such research approaches can be based on feelings. On the other hand, subjectivity, particularity of truths is also characteristic of several modern qualitative methodologies. Again, these qualitative research world-views turn out to be consistent in their inconsistency; if subjectivity—isolated subjectivity—is acceptable for them, then reliance on feelings follows logically. Because rational thought implies regularity, principles, laws—the generalities of common sense in the Hegel's words—that must be followed in the process of data interpretation. Subjectivity, however, belongs to the subject; it is either

opposite or independent of rationality; it is feelings that distinguish one subject from the others. Again it becomes clear that in many cases qualitative researchers study not external universe but the object is the researcher him/herself. Scientific explanation and understanding is not achieved by such procedures.

Studies of What Cannot Be Understood in Principle—Uniqueness

> Qualitative researchers, on the other hand, are committed to an emic, idiographic, case-based position that directs attention to the specifics of particular cases. (Denzin and Lincoln 2005a, p. 12).

Another problematic characteristic of several modern qualitative research approaches is their aim to understand the individual, the unique. This, however, is impossible in principle (see for detailed analysis of this issue, Toomela 2010b; g). The reason is the same again—externally similar behaviors may rely on different psychical structures and vice versa. In that case observation of a unique case can at the very best result in the hypothesis, theory about what kind of structure might underlie the observed things or phenomena. That theory or hypothesis, however, must be tested. Testing requires another case that can be studied further. So, unique cannot be understood in principle, understanding and explanation is limited to things and phenomena that repeat. Study of such repetitions allows revealing the structure of the phenomenon or thing.

In this context I think one issue should be mentioned. Often it seems that unique is opposed to universal. This is wrong. The same things and phenomena are simultaneously unique in some respects and universal in others. Scientific knowledge, in fact any knowledge, is constrained to universals because knowledge implies prediction. Unique cannot be predicted because unique means not repeatable in principle.

Sampling

Knowledge emerges only in the process of comparison and therefore it is vitally important for psychology to choose who and in which respect should be compared. In modern qualitative methodology, there are problems related to choosing the persons for participating in the study. It is not clear, however, whether these are distinct problems or just consequences of the fallacies discussed so far.

The problems of sampling may stem from the fallacies already discussed—studying without questions, limits on kinds of methodical procedures, and confusions with the object of studies. Each of these would inevitably lead to atheoretical or theoretically not grounded sampling. For instance, if the aim of science is to understand hidden from direct observation characteristics of the studied thing or phenomenon then the participants of the study should also be chosen according to those theoretical characteristics that are not apparent. Modern qualitative methodology has no access to such characteristics and consequently the participants are chosen on the basis of certain apparent properties. This, however,

leads to treating individuals as similar even they are not so in their psychic structures and also treating as different those whose psychic structures may be similar. In such situations comparison of individuals may turn out to be inappropriate.

Next, there is so-called theoretical sampling that is applied in certain approaches of modern qualitative methodology (e.g., Corbin and Strauss 2008). Theoretical sampling is, by their definition,

> A method of data collection based on concepts/themes derived from data. The purpose of theoretical sampling is to collect data from places, people, and events that will maximize opportunities to develop concepts in terms of their properties and dimensions, uncover variations, and identify relationships between concepts. (p. 143)

And when does the researcher know that sufficient sampling has been achieved?

> A researcher knows when sufficient sampling has occurred when the major categories show depth and variation in terms of their development. (p. 149)

The main obstacle to use such sampling is one of the fallacies discussed above—the aim of modern qualitative studies is the study and development of concepts and not the phenomenon itself. If the researcher finds—how? Perhaps by "feeling"?—that categories are what they call "saturated," i.e., completely developed or at least sufficiently developed, then the study is accomplished. In fact, there is no rational criteria external to the symbolic representations and/or subjective feelings for deciding when the sampling has been sufficient and there is no need for further studies.

Another fallacy that further complicates this sampling methodology is related to limitations of the methods of study. There is, indeed, no methodical way to go beyond superficial description of the "studied" phenomena in order to link the phenomena to the theories about them. So, the decision whether the study ends is fully in dubious data interpretation procedures (another fallacy!) and may not relate to the studied phenomenon.

Yet there are other questionable sampling practices that may be related to separate problems. Take, for instance, so-called snowball sampling. In snowball sampling, it is the participants of the study who are asked to recommend further participants for the study from among their acquaintances. In that case serious distortions in the selection of participants are likely to emerge because the participants are usually not qualified to make decisions about who actually should fit the purposes of the study; the researcher may have access to this knowledge but not necessarily the participants.

Modern qualitative research, similarly to quantitative approach, sometimes relies on sampling procedures based on certain pre-specified characteristics. The problem here is not related to pre-specification—this is preferable to non-specification—but rather in the criteria for selection. These criteria tend to be, both in quantitative and modern qualitative studies, based on appearances which are very common and yet theoretically questionable. Criteria such as profession, gender, nationality, socio-economic status, or age, have no unambiguous interpretation. Gender, for instance, is a concept that covers so many biological, psychological, and social-cultural factors simultaneously that it is impossible to disentangle them. The same applies to other

mentioned criteria as well. Persons who are selected into a group on the basis of any one of such criteria may belong to that group and yet be qualitatively different from the others. In case of socio-economic status, for example, the status may be achieved by so many different ways that any generalization for the whole group would apply to a small part of the group only. Age may seem superficially to be unequivocal criterion, but it is not. There are variations in experience as well as variations in biological processes of aging so that the only common characteristic to the persons in the group may turn out to be their birth date.

Summary of Problems with the Modern Qualitative Research Methodologies

Altogether, modern qualitative methodologies are characterized by several fallacies. It must be stressed that it is not all modern qualitative methodologies that are characterized by all the fallacies discussed in this paper. Some fallacies are shared by many and others by a smaller number of qualitative approaches of today. However, each of the identified fallacies alone would be sufficient to exclude possibility for structural-systemic scientific understanding and explanation. Such methodologies cannot go beyond superficial description of appearances, of characteristics of the studied things and phenomena that can be directly observed by the researcher. Conjectures made on the basis of observations more likely represent implicit before the "study" researcher's views on the studied phenomenon rather than—or inseparably together with—characteristics of the studied phenomena.

Quantitative methodology, even though not appropriate for structural-systemic understanding and explanation, is still very valuable as a tool for guiding pragmatic decisions (Toomela 2010e). Modern qualitative research that is characterized by the fallacies discussed above, however, provides mostly narratives and stories which value is questionable both in theory and even more in practice. David Hume, in the passage that introduces this article, suggested that there are methods and theories that bring us to a fairy land instead of knowledge. I think there is enough ground to suggest that—metaphorically speaking (perhaps it is worth mentioning here that metaphors can be used as heuristic devices in science but they must be discarded after use because they are wrong, Dooremalen and Borsboom 2010)—modern qualitative methodologies may be just other paths to a fairy land; to a land where science and fairy-tales are equally acceptable truths.

This conclusion can be further supported by a contradiction that characterizes the status of qualitative research today. On the one hand, even though still peripheral, the frequency of publishing qualitative studies increases in many fields of science, including counseling research (Berrios and Lucca 2006), general medicine (Yamazaki et al. 2009), language teaching (Richards 2009), social research (Gwyther and Possamai-Inesedy 2009), and psychology (Rennie et al. 2002). At the same time, however, qualitative research is increasingly rejected as non-scientific by major research-funding agencies in different countries, USA (Denzin and Lincoln 2005a; Lather 2004) and Australia (Gwyther and Possamai-Inesedy 2009) among them.

It is interesting to see what arguments are provided by qualitative researchers to ground their rights for *scientific research* funding. Quite characteristic to qualitative researcher's arguments have been provided by Lather (2004). So, what are the reasons for supporting qualitative research in science? Perhaps there are scientific

arguments involved? No, it turns out that it is *social critique* of science that should shape contemporary thought about policy-driven research (p. 17). There are many emotionally highly loaded terms and statements in that article that assure—the dominant quantitative scientific methodology is "racialized masculinist backlash against the proliferation of research approaches that characterize the past 20 years of social inquiry" (p. 15, Abstract). This article also includes numerous references to other authors who have expressed ideas that agree with Lather's understanding. What is completely missing is any rational logical argument in favor of the qualitative approaches Lather is advocating. It is not the issue that examples of application of qualitative research can be provided—applications are possible without any research as well. Just there are no criteria accepted by qualitative researchers to decide whether the desired results have been achieved with the applications suggested by the researchers. Qualitative researchers, it seems, provide a lot of arguments—such as those expressed in the Lather's paper—that convince anybody who aims at rational decisions to reject modern qualitative research as option. All decision making, actually all life is based on feedback, information actively searched for deciding whether the expected result has been achieved (Anokhin 1975); narratives and fairy-tales are not appropriate tools for grounding pragmatic decisions. Those who make decisions about financing seem to understand it.

In sum, modern qualitative research approaches are not the ways to achieve scientific knowledge as defined in this article; they are methodologies that ground numerous methods for creating stories that, in fact, could as easily be constructed without any "study." I can—I do—agree that quantitative approach to the study of psyche is inappropriate; but it does not follow automatically that any qualitative methodology is immediately acceptable. Modern qualitative psychology, i.e. psychology which methodology is characterized by any of the fallacies I discussed, can be characterized by a paraphrase of the famous words by Heraclitus (Toomela 2011; cf. Kirk et al. 2007, p. 195, DK22b12 and 91):

> Upon those that step into the same science different and different discourses, texts, narratives and stories flow ... They scatter and ... gather ... come together and flow away ... approach and depart.

So, another solution to the difficulties psychology faces today should be searched for. One solution is proposed; it is called mixed methods approach.

Fallacies of the Mixed Methods Approach(es)

Mixed methods approach aims to integrate (modern) qualitative and quantitative approaches (e.g., Johnson, et al. 2007). This approach is also becoming more popular in both applied and theoretical research (Alise and Teddlie 2010; Fielding 2010). Establishment of the *Journal of Mixed methods Research* in 2007 is also evidence that this new approach has won an increasing number of supporters.

Similarly with modern qualitative approaches, mixed methods do not constitute one research strategy but rather there are several different approaches distinguished by differences in the roles attributed to the qualitative and quantitative methods as

well as the ways of integration (Denscombe 2008; Gelo et al. 2008; Hall and Howard 2008; Teddlie and Tashakkori 2006). Yet, what is common to all the mixed methods approaches discussed next is that they try to integrate quantitative methodology with the *modern* qualitative methodologies—methodologies that are characterized by one or more of the fallacies discussed in this paper. So, the following discussion applies to all such versions of mixed methods.

Mixed methods approach emerged on the basis of dissatisfaction with both quantitative and qualitative methodologies. Integration of them may give solution if the weaknesses of the approaches are not shared. In some sense it is correct—one studies mostly groups and the other focuses on individuals; one aims at generalization and the other at understanding particulars; one relies on very mechanical methods of data collection and interpretation whereas the other is open to discoveries and novelty at every step of inquiry.

It is noteworthy, however, that usually the methodological discussion goes around the opposition of qualitative and quantitative approaches. This is the reason, I believe, why fundamental fallacies shared by both are not searched for. Yet, there are fallacies that characterize both of them. Characteristic example suggesting that methodological discussion is mostly organized around qualitative-quantitative opposition can be found in Gelo et al. (2008). Their article on mixed methods was published as a Commentary to my critique of the quantitative methodology (Toomela 2008b). Yet, instead of analyzing the arguments I proposed and discussing whether similar problems may characterize qualitative approaches, it was suggested that the problems related to quantitative methodology will be solved with the mixed methods approach. This position was taken as granted; there was no discussion or analysis whether this approach is truly appropriate for the study of psyche. The discussion focused on methods, what was supposed to reveal with the help of these methods, was left out. And this is exactly where the difficulties are—methods and methodology needs to be analyzed in terms of questions that are supposed to be answered rather than in terms methods themselves.

I am going to discuss next the fallacies shared by quantitative and modern qualitative methodologies which do not allow solving the difficulties psychology is facing today by the mixed methods approach. Again, two points are worthy to mention. First, I am not suggesting that the list of problems common to both approaches is exhaustive. And second, structural-systemic understanding and explanation cannot be achieved even when one of the common problems is present; there may exist approaches that are not characterized by all but only one or two of the fallacies and yet these approaches are flawed. Altogether, I was able to identify four common fallacies. As all of the problems related to them have been already discussed here and elsewhere (see the list of references), I will not discuss them in details.

Epistemology

Quantitative methodology, following Cartesian-Humean epistemology, studies relationships between things and events, not things themselves. Study of relationships, when relationships are conceptualized only quantitatively, in terms of covariations, excludes any possibility to understand what the thing or phenomenon

is because, according to structural view, qualitatively different wholes emerge when the same elements are in qualitatively different relationships (Toomela 2010e). Therefore, study of quantitative relationships is not appropriate for discovering structure of things and phenomena.

Modern qualitative methodologies are similarly unable to reveal what the thing or phenomenon under study is. The reasons, however, are different. Here the problem is that for Heraclitian epistemology that underlies qualitative approaches there are no clear boundaries between things; the world is a continuous and constant process. So qualitative methodology cannot find anything "fixed," but only flow and change. As the world is continuous in this epistemology, the events are related one to another in the constant flow; the study aims at this continuity of relationships without being able to go beyond superficial descriptions.

Even though the reasons as to why scientific explanation and understanding cannot be achieved by either of the methodologies integrated in the mixed methods approach are different, the integration does not provide solution because both of the methodologies are inappropriate for discovering what the thing or phenomenon under study is.

Priority of Methods Over Scientific Questions

In both methodologies that are integrated in the mixed methods approach decisions about methodology and, correspondingly, set of methods, are made before the questions and studies. These decisions exclude not only answers but even certain questions; first of all the question, what the studied thing or phenomenon *is*? This question, as a rule, is not even asked. If this question is asked, both quantitative and modern qualitative approaches must be rejected as inappropriate for answering it, as was discussed above. Integration of the methodologies, thus, is not a solution as well.

Limited Kinds of Methodical Procedures—No World Beyond Appearances

Modern qualitative research cannot go beyond appearances because artificial constraints on study-situations are rejected a priori. Consequently externally similar behaviors that emerge from different structures cannot be distinguished; also externally different behaviors would be classified as different independently of their structural basis.

Experiments are legitimate in the quantitative methodology. Yet, quantitative approach has the same limitation—there is no way to go beyond appearances. The reason is that quantitative methodology does not interpret descriptions of the things or phenomena directly; there *variables* that encode observed behaviors are interpreted. Variables, however, encode externally similar behaviors as the same even when different psychic structures underlie these behaviors. Also, externally different behaviors are represented as different even when similar structures underlie them. After encoding, there is no possible way to reveal structural similarities and differences with any quantitative data-interpretation procedure (Toomela 2008b).

In order to reveal the structure of the thing or phenomenon, qualitative experimental studies—both analytic and constructive experiments—together with observations conducted in artificially created or constrained situations would be necessary. Integration of quantitative and modern qualitative approaches does not

solve the problem because such qualitative methods are excluded in both of them. If they would be used, there would be also no need for quantitative methods at all.

Adevelopmental Nature of Studies

Discovery of the structure requires study of development, study of emergence of novel wholes. Modern qualitative methodology is adevelopmental by nature because it cannot distinguish manifestation from emergence; it is also not able to construct the studied phenomena purposefully. Purposeful construction would require creation of artificial situations. The same limitation applies to quantitative approach because there qualitative differences disappear when observations are encoded into variables. Quantitative methodology is able to suggest how to elicit phenomenon, but elicitation cannot, again, distinguish manifestation from emergence of the qualitatively novel whole. Thus, integration of methodologies is not a solution also because both integrated approaches are adevelopmental by nature.

The Fourth—The First—Way

Destructive critique is necessary in science because science aims at achieving knowledge, explanation, and understanding. Knowledge, in turn, implies conceptual constraints, limits on possible states of the world. Destructive critique is a method for putting such limits. Yet, with this article, together with the other methodological papers (see the list of references), I have provided arguments against all three methodological approaches that can be found in psychology today—quantitative, (modern) qualitative and mixed methods. By doing this, I do not propose that science of psyche is impossible; I also do not take the stance of the Greek skeptics and suspend the decision. In fact, with the deconstructive criticism outlines of the constructive methodology have been provided—any limit or constraint distinguishes X from non-X; one becomes defined in relation to the other. By saying that quantitative methodology cannot ground science of what a thing or phenomenon is, I have declared that qualitative methodology must be appropriate. By saying that certain qualitative methodologies are inappropriate, I have simultaneously defined the characteristics of the methodology that should be free of the fallacies described above.

The qualitative methodology that emerges from my destructive critique, is not truly the "fourth" methodology; historically it is the first, it existed before the three methodologies that can be distinguished in today's psychology—there are reasons to suggest that the qualitative methodology followed by the continental European psychologists before the WWII has most of the characteristics that are essential for scientific understanding and explanation. It is beyond the scope of the present article to discuss this methodology in sufficient details. It has been described elsewhere in some more (but still not sufficient) details (Toomela 2007a, b, 2009, 2010b, 2011). So, I will provide only short summary here. I present this summary as a set of theses.

1. Methods must be qualitative.
2. All studies must be theory guided; theory must be articulated at different levels of analysis beginning with the unifying theory of psychology that proposes how

different aspects of mind and therefore different branches of psychology are connected.
3. Theory must be explicit that makes it possible to be constantly questioned at all levels, beginning from epistemology and ontology to the specific theories of the studied things and phenomena.
4. Methods must include observations in natural settings, observations in artificially constrained settings, analytic experiments where qualitatively different structures and elements of structures are identified, and constructive experiments where attempts are made to construct the studied phenomenon or thing.
5. All methods must be developmental, i.e., the results of studies must be possible to interpret in terms of development.

Structural-systemic methodology is not commonly used in psychology today. Yet there are examples how it was applied. Many examples of methods that partly correspond to the theses above can be found in different German-Austrian gestaltist-structuralist schools of psychology before the WWII. Yet, these tended to be adevelopmental and sometimes also not fully explicated at the epistemological level. Methodology and methods, applied by Vygotsky and Luria, however, correspond to all the theses; their theory, including *methodology* (which is fundamentally distorted and misrepresented by mainstream scholars today, cf. Mahn 2010; Veresov 2010) can be the departure point for developing further the structural-systemic science of psyche.

Conclusions

Both quantitative and modern qualitative methodology has been criticized by many scholars. As a rule, the criticism is built on opposition between the quantitative and modern qualitative methodologies. From this perspective, several fundamental shortcomings that characterize both of these methodologies—together with attempts to integrate them in the mixed methods approach—are not recognized. In this article I suggested, first, that science aims at understanding and explanation. As an epistemological point of departure, structural-systemic epistemology and corresponding scientific methodology was taken. From the perspective of structural-systemic science, quantitative methodology is not appropriate for achieving knowledge about what the studied thing or phenomenon is. What is left over is modern qualitative methodology, mixed methods approach, and structural-systemic qualitative methodology that was abandoned for no scientific reason after the WWII.

Modern qualitative methodologies suffer from several fallacies: they are grounded on inherently contradictory epistemology, ask scientific questions after the methods have been chosen, conduct studies inductively so that not only answers but even questions are often supposed to be discovered, do not create artificial situations and constraints on study-situations, are adevelopmental by nature, study not the external things and phenomena but symbols and representations—often the object of studies turns out to be the researcher rather than researched, rely on ambiguous data

interpretation methods based to a large degree on feelings and opinions, aim to understand unique, and have theoretical problems with sampling. Any one of these fallacies would be sufficient to exclude any possibility to achieve structural-systemic understanding of the studied things and phenomena.

It also turns out that modern qualitative methodology shares several fallacies with the quantitative methodology. Therefore mixed methods approach is not able to overcome the fundamental difficulties that characterize each of them taken separately.

Finally, I propose that destructive criticism of the methodologies allows delineating positive program, structural-systemic methodology that was used by several scholars more than half a century ago. This methodology has been developed at different levels of analysis beginning with the most fundamental issues of epistemology and ontology and ending with specific theories about specific psychic processes. This methodology seems to be philosophically and theoretically better grounded than the other methodologies that can be distinguished in psychology today. Future psychology should be based on structural-systemic methodology.

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