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A Reply to Tryon's: "A Reply to Löker's 'Theory in Psychology'"

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Tryon's (1999) reply to Löker's (1999) criticisms of Tryon's (1996) "Measurement Units and Theory Construction" necessitates clarification at several points and the correction of the errors it contains. Tryon appears to have changed some of his positions, perhaps being influenced by my (Löker, 1999) criticisms, but he still ignores how theories are constructed. Tryon even states that my explanations of how theories are constructed in physics and how they can be constructed in psychology are outside the scope of his article, despite the fact that the title, main topic, and the conclusion of his original article concern theory construction in psychology which is the reason, no doubt, why his article was published in a psychology journal. His mistakes about, and distortions of, my ideas and also his distortions of his own earlier (Tryon, 1996) statements are exposed and corrected in the present article.

The main ideas put forth by Tryon (1996) in his article "Measurement Units and Theory Construction" which appeared in this journal are as follows: measurements units used in physics are theoretical concepts and are algebraically combined to define new concepts and units; these algebraic combinations are definitional statements of conceptual equivalence and create a knowledge hierarchy in physics and thus constitute theories; and, psychologists can construct theories by following the example of physicists and combining measurement units algebraically in successive steps after adopting at least two fundamental units to begin with. By presenting these ideas, Tryon claimed, or implied, that he explained how theories are constructed in physics and how they can be constructed in psychology. I will consider later Tryon's ideas resulting from his above thesis. Tryon (1996) supported his claims about theory construction in physics by using a few equa-

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tions of physics as examples, which he presented as definitional statements of conceptual equivalence — without explaining how they were conceived and implying that they were arbitrarily created by physicists.

In my reply (Löker, 1999) to Tryon's (1996) article, I examined in detail all of the equations of physics used by Tryon as examples and showed that they are of four different types: (1) only the equation defining acceleration a=dv/dt fits Tryon's description; (2) the equation defining density d=m/v is a definition but also expresses a law of nature learned from experience and not created arbitrarily as Tryon implies; (3) the equation of motion f=ma is not a definition but expresses a law of nature discovered through experimentation and much theoretical thinking as I explained; and (4) the equation $f=Gmm'/r^2$ which gives the value of the gravitational force is also not a definition but a law of nature discovered by constructing a theory. And I explained that theories are constructed not by inventing definitions in an unknown way but by integrating at least one hypothesis with known facts, and that non-quantitative theories can be constructed in psychology today using verbal logic in lieu of mathematics. I also criticized Tryon explicitly for: (a) considering all equations of physics as definitional statements of conceptual equivalence, (b) ignoring that some of them are natural laws, (c) not explaining how the equations of physics are conceived of, (d) nevertheless advising psychologists to create such equations in their science, and (e) claiming that psychological theories have to be made up of equations. All this means that Tryon's thesis on theory construction is limited and may even be misleading.

In his reply (Tryon, 1999) to my reply (Löker, 1999), Tryon begins by summarizing the main points of his thesis (1996) as follows, calling them subsequently "Tryon's points (a) through (e)":

> Tryon (1996) in this Journal made the following points: (a) measurement units are theoretical concepts because measurement presumes theoretical definition of the quanta being measured, (b) new theoretical concepts can be constructed through the algebraic combination, usually multiplication or division, of previously defined measurement units, (c) physics developed such a knowledge hierarchy along with discovery of natural laws, (d) the current lack of emphasis on measurement units in psychology precludes a similar development in psychology, and (e) psychology has long used time as a fundamental unit which means that we only need to create a second unit to begin this process. (Tryon, 1999, p. 295)

The above quoted "Tryon's points (a) through (e)" distort his thesis (Tryon, 1996) in two ways: (1) Tryon never mentioned natural laws and their discovery in his original article as he did in his above quoted point (c) — because he thought that natural laws were definitions, not laws. (2) In his above quoted points (a) through (e), Tryon does not mention that he claimed in his original article that the algebraic relations that make up theories are

statements of conceptual equivalence. Tryon's omission of the idea of "conceptual equivalence" and his addition of the expression "discovery of natural laws" distort his original thesis seriously and create the erroneous impression that he knew, before he read my reply (Löker, 1999), that some algebraic relations of physics were not conceptual equivalence statements but were natural laws that were discovered. If he really knew that, he would have explained how those laws were discovered.

Tryon (1999, pp. 295–296) then gives a list of Löker's (1999) criticisms (a) through (g) determined by Tryon. I do not quote this list to save space because each point contained in it is individually discussed below. This list of Tryon's does not include Löker's (1999) criticism that Tryon (1996) wrongly considers the algebraic relations of physics not only as definitions but also as statements of conceptual equivalence, which is a point not mentioned by Tryon (1999) in his above quoted points (a) through (e) which are supposed to present Tryon's (1996) original thesis. Tryon's list also does not include the fact that Löker (1999) explains how non-quantitative theories can be constructed in psychology at the present time, which proves that Tryon's thesis is misleading. Moreover, by dwelling only on some particular points individually and ignoring others, Tryon tries to hide Löker's basic and general criticism that Tryon (1996) does not explain how the algebraic relations he is talking about are, and can be, conceived of, and that this makes Tryon's thesis weak in theory construction. After giving the list of Löker's (1999) criticisms determined by Tryon, Tryon says: "The remainder of the present article considers these 'criticisms' and shows that none of them invalidates Tryon's fundamental thesis that measurement units are theoretical concepts because they define the quanta being measured or his other four points" (Tryon, 1999, p. 296). Tryon refers here to his points (a) through (e) quoted above and implies that they represent Tryon's (1996) thesis adequately, and he implies as well that his list of Löker's criticisms (a) through (g) determined by Tryon also represents Löker's criticisms adequately. I discuss these in detail below.

"Löker (1999) distinguishes between equations that are definitional and equations that reflect empirically discovered natural law [his point (a)]" (Tryon, 1999, p. 296). Tryon claims, between his brackets, that this is Löker's point (a) in Tryon's above mentioned list of Löker's criticisms (a) through (g) determined by Tryon, which is in reality as follows: "(a) only some mathematical relations in physics are definitions; others express natural law" (Tryon, 1999, p. 295). Thus, Tryon presents Löker's criticism (a) determined by Tryon in two different ways, first using the expression "natural law" and then the expression "empirically discovered natural law." The addition of "empirically discovered" by Tryon to his earlier statement distorts not only his earlier statement but also my statements, because I explained in detail

that only some laws of nature can be discovered empirically, while others are discovered by constructing theories using a special method, not by creating arbitrary definitions as Tryon claims. Thus, by distorting his own and my statements with his use of the expression "empirically discovered laws," Tryon tries to bury my criticism, or thesis, that some laws of nature can be discovered only by constructing theories (Löker, 1999), which is really the core of the problem of theory construction. Tryon did not mention "empirically discovered natural law" in his original article and presented all mathematical relations of physics as definitional statements of conceptual equivalence, without explaining how definitional statements are created. This makes his recommended method of theory construction incomplete and misleading. Tryon (1996) seems to have never thought that measurement units serve to measure the results of experiments and observations realized to discover the laws of nature — the laws of nature being found by Tryon unworthy of being mentioned in an article about theory construction.

Tryon continues to make statements that need to be corrected:

> Instead of giving a clear example of an equivalence statement that is definitional and one that reflects natural law, Löker asserts that the formula for density (d) in terms of mass (m) per unit volume (v) [d=m/v] "represents a 'law of nature'" ([Löker, 1999], p. 278) and criticizes me for not explaining how this relationship was discovered. He treats Newton's equation of force with accelerated mass [f=ma] in the same manner. (Tryon, 1999, p. 296)

Contrary to this claim of Tryon's, I clearly stated several times that, for example, the relation that introduces acceleration is a true definition independent of the laws of nature, as in the following two quotations: (1) "Newton *defined the concept of acceleration* using differential calculus, which he had invented, and *defined the unit of force* using the existing concept of force and the empirical law of motion" (Löker, 1999, p. 279). (2) "The choice of units is arbitrary . . . but the mathematical relations that connect the values of the physical quantities measured in these units are the laws of nature . . . excepting of course the relations that really express definitions, such as a=dv/dt" (Löker, 1999, p. 281). And I explained in detail (Löker, 1999) how some rules of nature were discovered either empirically or theoretically, calling them *laws*, including the law of mass distribution and the law of motion which are presented by Tryon as definitional statements of conceptual equivalence. The relation d=m/v defines density, but it does it on the basis of the empirically discovered natural law that mass, or weight, is proportional to volume. Thus, a *law of nature* was used to *define* a new concept, unlike in the definition of acceleration a=dv/dt which does not express a law. The relation f=ma defines the unit of force in terms of the units of mass and acceleration, but it expresses a law of nature, *called* "the *law* of

motion," and is discovered as a result of several experiments and much theoretical thinking. In this case, a *law of nature* was used to give a precise meaning to the existing concept *force* and to define its unit of measurement, and the law became one of the equations of Newton's theory of mechanics unlike the definitional relation a=dv/dt which remained more as background knowledge related to nomenclature. In opposition to these two law-based relations d=m/v and f=ma, the relation that expresses the law of gravitation $f=Gmm'/r^2$ is not an empirical but a theoretical law, discovered through theory construction, and it is certainly not a definition invented for convenience like the definition of acceleration a=dv/dt. I (Löker, 1999) explained all that very clearly and in detail. I also showed that a discovered law of nature, for example the law of gravitation $f=Gmm'/r^2$, can be used to define a quantity contained in it, such as the constant of proportionality $G=fr^2/mm'$ which can be considered a characteristic property of space, but that this does not make the discovered law of nature $f=Gmm'/r^2$ an arbitrary definition (Löker, 1999, p. 281).

Tryon (1999) did not mention the law of gravitation, because this law is discovered through theory construction as I explained and is not a definitional equivalence statement as Tryon (1996) claims in relation to all mathematical relations of physics. Moreover, in his above quoted lines, Tryon mentions that I criticized him for not explaining how the laws of density and motion were discovered, but by doing this, he hides the fact that I criticized him in reality for not explaining how any law of physics was discovered and for claiming that all equations of physics express definitional statements of conceptual equivalence created in an unknown way. Furthermore, Tryon again does not mention the law of gravitation which represents the type of law that can be discovered only through theory construction. Thus, Tryon continues to ignore the basic fault of his thesis, namely, his failure to explain how the algebraic relations of physics are conceived; he also abstains from mentioning a natural law of the type that is most difficult to discover and which necessitates a valid method of theory construction, namely, the law of gravitation.

Tryon's following lines make him look like he knew that all equations of physics are not definitional statements of equivalence created arbitrarily, but that some of them are derived from experience; moreover, these lines mispresent Löker's (1999) criticisms:

> While our understanding of both density and force undoubtedly had its origins in experience with the physical world long before these concepts were expressed as equivalence statements, this fact does not negate Tryon's points (a) through (e) as Löker implies. (Tryon, 1999, p. 296)

By talking about "experience with the physical world," Tryon admits once more that his definitional equivalence statements such as the relations defin-

ing the units of density and force are based on experience. He did not mention this in his original article, although he recommended that psychologists create such relations in their science. Also, the expression "experience with the physical world" excludes that some laws of nature cannot be learned directly from experience but are discovered through theory construction. And theory construction consists neither of mysteriously inventing combinations of concepts and units nor of learning the laws of nature directly from experience without using hypotheses and integrating them with known facts, which is how theories are really constructed. The basic mistake in Tryon's original article (Tryon, 1996) is not "Tryon's points (a) through (e)" summarized at the beginning of his reply (Tryon, 1999) to me but his claim that these points explain how theories are constructed in physics and how they can be constructed in psychology — because he does not explain how the algebraic combinations of concepts and units which he talks about in these points are conceived. Additionally, his points (a) through (e) wrongly imply that theories can be constructed in psychology only by making use of measurement units, and that measurement units serve to invent definitional combinations of units and not to discover natural laws by measuring the results of experiments and observations conducted for this purpose.

"Formulas *formulate* [Tryon's italics] and this is a theoretical act that applies equally to our idealizations of natural law as to definitional statements" (Tryon, 1999, p. 296). In this statement, Tryon wants again to look like he knows that some equations are definitions and others are expressions of natural laws even though he never used the expression *natural law* in his original article. Yet according to Tryon, theories are constructed not as I explained but by creating definitional equations in a way unexplained by him.

"That formulas formulate is not dependent upon the degree of experience or experimentation prior to mathematical formulation nor does it depend on how one went about obtaining the data upon which the formulation was based" (Tryon, 1999, p. 296). Of course formulas formulate under all conditions, but this is not what we are discussing. Tryon admits again that some of the "formulas" are derived from experience and are not arbitrary definitions as he claimed in his original article. He still ignores that some "formulas," or laws of nature, cannot be *deduced* directly from experience but are discovered by constructing theories as I explained. This is really the heart of the problem of theory construction, because empirically discovered laws do not constitute theories. In other words, the human mind is capable of constructing theories by using wide-scope *inductive* thinking alongside *deductive* thinking and thereby transcending the knowledge that is directly *deduced* from experience.

"It is worth noting that Newton could not have empirically discovered that f=ma as Löker maintains because this would require independent mea-

surements of force, mass, and acceleration at a time when no unit of force was defined" (Tryon, 1999, p. 296). This is again a misrepresentation of my statements, because I did not say that Newton discovered the law of motion by making precise measurements. I explained in detail that several means were available to Newton for discovering this law, including Galileo's empirical findings, Kepler's semi-empirical rules, and an experiment in rough quantitative form suggested by Omnès (1973), which could be only thought of by Newton, not actually performed. I also stated that generally the laws of nature are first conceived of in qualitative form, then in rough quantitative form, and finally given precise mathematical, numerical form by being integrated with the available quantitative knowledge; and I provided examples. Tryon wrongly portrayed me as saying that Newton discovered the law of motion by making measurements. On the contrary, I strongly emphasized in detail the theoretical means that helped Newton to discover this law, in addition to the empirical knowledge mentioned above. "Newton's contribution was to give specific meaning to the previously vague idea of force by *formulating* [his italics] it in terms of accelerated mass" (Tryon, 1999, p. 296). Here Tryon repeats what I have said in my reply to his original article: "Newton introduced this old concept of force into physics in a precise, quantitative form through the relation f=m.a, but not as a definition, as explained below" (Löker, 1999, p. 279). Tryon had claimed in his original article that Newton "derived" the concept of force from the relation f=ma, which is in reality a law of nature but is presented in his original article as a definitional statement of conceptual equivalence invented by Newton in a way unexplained by Tryon.

"Physics now had an additional well formulated concept of force with which to understand physical phenomena" (Tryon, 1999, p. 296). This is a confusing statement, because here Tryon gives a vague form to, and presents as his own, my explanation that physical phenomena are explained as interactions of forces of various origins and that therefore the concept of force is used in physics as an integrating tool (Löker, 1999, p. 288). There was no need to praise Newton's work unless Tryon wished to suggest that I denied its value.

In his lines quoted below, Tryon once more wishes to look like he knew that some of the equations of physics were derived from experience, which is something he did not mention in his original article, and also mis-presents again my criticisms:

> I [Tryon] did not discuss scientific laws and how they were discovered . . . because, as stated above, the methods used to collect data have no bearing on the thesis that measurement units are theoretical entities . . . and that new concepts can be defined through algebraic combinations of previously defined measurement units. This position does not make me hostile to the laws of nature which is why I never said that they are unscientific as Löker charges. (Tryon, 1999, p. 297)

The main thesis of Tryon's (1996) original article is not that measurement units are theoretical entities and can be combined — which are obvious facts — but that theories are constructed in physics, and should be constructed in psychology, by [mysteriously] inventing such combinations which are presented by Tryon as definitional statements of conceptual equivalence. But those relations are not definitional statements of conceptual equivalence, with the exception of true definitions such as a=dv/dt; they express natural laws and are discovered either empirically or by constructing theories as I stated. Even some definitions are based on laws, such as d=m/v. Tryon's original article does not suggest that he knew that some equations of physics were "scientific laws" and were discovered empirically, contrary to what is implied in his above quoted lines. If he recognized the place of natural laws and empirical knowledge in theory construction, he would have had explained how the laws of nature were discovered, because theories are made of natural laws. The equations expressing true definitions are not presented among the equations that express laws of nature and constitute a theory, and all laws of nature cannot be *deduced* directly from experience as Tryon now appears to believe, judging from everything he says in his reply to my reply. To repeat, the mathematical relations constituting a theory express natural laws, and some of them are discovered through experience and some through theory construction, while true definitions remain as background knowledge related to nomenclature. And it would be unreasonable to say that someone is hostile to the laws of nature. Thus, I did not say that Tryon saw the laws of nature as unscientific. I only said that he appears to consider the concept *law of nature* as unscientific, and this seems to be the case, because he did not use this expression in his original article and, instead, he talked about definitional statements of conceptual equivalence — of unknown origin — which, in reality, express natural laws.

"Löker incorrectly asserts that Tryon . . . 'believes that measurements serve only to determine the characteristic properties of substances'" (Tryon, 1999, p. 297). Tryon did not explain in his original article or in his reply to my reply what was precisely gained by scientific research and theory construction other than building a knowledge hierarchy and determining the characteristic properties of substances. Evidently, because Tryon thought that the mathematical relations that express natural laws and make up the theories of physics were all arbitrary definitions and not themselves natural laws, he failed to see that measurements served to discover natural laws and therefore thought that they served only to determine the characteristic properties of substances. Next, Tryon (1999, p. 297) explains at length the usefulness of definitions, and this creates the erroneous impression that I had denied that usefulness. He continues to mis-state my position:

> The first part of Löker's point (g) [in Tryon's list of Löker's criticisms mentioned above but not quoted] accuses me [Tryon] of attempting to reduce all theory to measurement and all psychology to behaviorism. Tryon's (1996) points are summarized at the beginning of this article [Tryon, 1999] and do not even come close to making either of the two claims Löker charges. (Tryon, 1999, p. 298)

"Tryon's (1996) points . . . summarized at the beginning of this article" are his points (a) through (e) which state that theories can be constructed in psychology by combining measurement units algebraically in a way unexplained by Tryon to create definitional relations, not by making measurements to discover the laws of nature. I have been generous to Tryon by saying that he reduces theory to measurement, because he does not talk in his original article about making measurements to construct theories. To be exact, I should have said: "Tryon reduces theory construction to combining units algebraically in an unknown way." Tryon cannot claim that this criticism is not deserved by his points (a) through (e). Reducing psychology to behaviorism would be the consequence of Tryon's recommendation of creating what he calls "behavioral physics" expressed at the end of his original article; therefore my related criticism is directed to this recommendation, not to Tryon's points (a) through (e) as he wrongly implies in his above quoted lines.

Tryon (1999) writes:

> Löker's section on "Theory Construction in Physics" presents his views on this subject but does not fault Tryon's point that units of measurement are theoretical entities or that measurement units can be combined algebraically to define new concepts thereby forming a knowledge hierarchy. (p. 298)

Contrary to Tryon's implication, I never said that measurement units were not theoretical entities, could not be combined algebraically, and do not create a knowledge hierarchy. Tryon appears to be incapable of accepting definitively that those combinations, when they are not definitions, express natural laws which need to be discovered either empirically or by constructing theories; they are not all definitions or relations introduced arbitrarily and mysteriously by physicists as Tryon implies in his original article. The main topic of Tryon's (1996) article is theory construction, and a theory of physics is made up of equations that express natural laws. But in that article, Tryon did not qualify the algebraic relations of physics as "natural laws" and did not explain how they are discovered, but nevertheless claimed that he explained how theories are constructed. He was able to claim this because he implied that those combinations are arbitrarily introduced by physicists. And he advised psychologists to do the same thing. His later insistence to abstain from explaining clearly how the combinations of concepts are created is a consequence of his seeking to hide his basic mistake of ignoring that the mission of science is to discover the laws of nature and that theories are made up

of these discovered laws. The quantitative concepts used in physics and their units of measurement are combined in the laws of nature, which are discovered either empirically or by constructing theories as I stated more than once, except that the relations that really are definitions and not natural laws can be created for convenience, for simplifying the thought processes and the equations that express them.

Tryon's following lines show that he is not interested in views about how theories can be constructed in psychology, and this means that he has no wish of going beyond his insufficient and misleading thesis:

> Löker's sections on "The 'Mechanism' of Mental Causation, or Mental Response" and "Functionality in Freud's Theories" are independent statements of the author's views rather than a reply to my original article as his main title indicates and are therefore beyond the scope of this response. (Tryon, 1999, p. 298)

The main topic of Tryon's original article is the method of theory construction used in physics and its application to psychology. My reply to his original article shows that the method he presents is insufficient and misleading because he ignores the core of the problem which is the discovery of the laws of nature; and he implies that those laws — presented by him as definitional statements of conceptual equivalence — are arbitrarily created by physicists. After exposing the fallacy of his thesis about theory construction in my reply to his original article, I explained the true method of theory construction used in physics and how it can be adapted to psychology. He responded by saying that the method of theory construction in psychology as explained by me is outside the scope of his original article (1996) as well as his "Reply to Löker" (1999) article — strange reasoning for articles on theory construction. He also implies that his thesis comprises only the views that physical units of measurement are theoretical entities and can be combined algebraically to thus create a knowledge hierarchy which constitutes a theory; but these views do not explain how the algebraic combinations are created and, therefore, how theories are constructed.

In his concluding lines, Tryon admits that he has not explained how theories can be constructed in psychology:

> In conclusion, measurement units are theoretical entities because they define what is being quantified. It is possible to define new concepts in terms of algebraic combinations of two or more of these units. This approach has led to a knowledge hierarchy within physics. It is therefore suggested that psychologists begin to consider how they might develop an analogous knowledge hierarchy in psychology. (Tryon, 1999, p. 298)

Tryon (1996) implied that he *explained* how psychologists could construct theories: by combining psychological measurement units and concepts alge-

braically to *define* new units and concepts to thus create a knowledge hierarchy which would be a theory. But in his above quoted lines, Tryon means that he only suggested (and still suggests) that "psychologists *begin to consider how they might*" create definitional combinations of measurement units and concepts, or how they *might* construct theories, we can say, since theories are made of such combinations. Thus, Tryon admits here that he has not explained how theories are constructed in physics and how they can be constructed in psychology. Tryon's (1996, 1999) thesis is not only insufficient but also misleading, because he claims that all theories are, and have to be, made of arbitrary algebraic definitions, or that all theories are, and have to be, arbitrarily *defined*. I explained (Löker, 1999) in detail how theories are *constructed* in physics and how they can be *constructed* in psychology — without using measurement units and mathematics.

Summary and Conclusion

All units of measurement are *defined* arbitrarily. Also, some concepts are *defined* for convenience, for simplifying the thought processes and their verbal and mathematical expressions. Tryon's (1996, 1999) error is to think that this operation of definition covers the totality of the equations of physics in which the units of measurement are used. In reality, only some equations of physics are definitions, such as a= dv/dt, while others express natural laws discovered either experimentally or by constructing theories. Moreover, a law of nature representing a causal relation is discovered as a proportionality relation which can be expressed by an equation that contains a constant of proportionality (Löker, 1999; Sena, 1972). For example, acceleration is proportional to force and inversely proportional to mass as expressed by the relation a=Cf/m, C being the constant of proportionality. This is a law of nature called the *law* of motion and is discovered as I outlined; it is not a definition as Tryon (1996, 1999) argues. In mechanics, three fundamental units are defined arbitrarily, and the rest of the units are defined by using the laws of nature and determining *arbitrarily only the constants of proportionality* that these laws contain. Thus, in the mks system of units, C=1 (arbitrarily, for simplification) in the above law of motion which thereby becomes a=f/m or f=ma. This relation *defines the unit of force* but is not created as a definition, excepting the value of the constant of proportionality C; it is a discovered law of nature.

Tryon (1996) did not mention the laws of nature because he thought that they were definitions. If he had known the place of natural laws in theory construction, he would have had explained how these laws were discovered. He most probably believed, prior to reading my reply to his article, that the concept *law of nature* was unscientific and useless. By interpreting a few

equations which he treated as typical equations of physics, Tryon implied that all equations of physics were definitional statements of conceptual equivalence, including those that in reality express natural laws. He did not explain how these statements were produced, but nevertheless advised psychologists to invent such statements in their science. Evidently, he thought that those definitional statements of conceptual equivalence could be invented arbitrarily. He thus believed that he had discovered the method to be used in psychology for constructing theories. He ignored that the method he recommended is the one that has been used not by physicists but by metaphysicists who tried to discover all truth by logically combining old and newly invented concepts. They failed, because a concept contains only the empirical knowledge that has been put in it. Even hypotheses are derived (not *deduced*) from experience by performing *inductive* operations on empirical knowledge obtained in vague form from diverse areas of reality. Both physicists and psychologists know that the real source of knowledge is experience and try to obtain knowledge through experimentation. But most modern scientists, and notably psychologists, do not make sufficient use of inductive thinking and do not try to construct theories. Often, semi-empirical knowledge or inconsequential speculations are presented by psychologists as theories. The reason is that the real method of theory construction used in physics is not clearly understood by psychologists; and what is understood needs to be adapted to psychology. This is what I have tried to present in my "Theory in Psychology" (Löker, 1999) as a reply to Tryon's (1996) article dealing with the same subject.

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