



CONCEPTUAL AND METHODOLOGICAL MISTAKES IN PSYCHOLOGY AND HEALTH: A CASE STUDY ON THE USE AND ABUSE OF STRUCTURAL EQUATION MODELLING

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Se analiza un trabajo de investigación que se justificó en la teoría del desarrollo psicopatológico, los factores protectores, la autorregulación, la resiliencia y la calidad de vida en una muestra de personas que vivían con diabetes tipo 2 e hipertensión; para el análisis de los datos se utilizó el modelamiento con ecuaciones estructurales (MEE). Aun cuando los autores concluyen sobre la pertinencia de los datos a la teoría probada, incurren en errores lógicos, conceptuales, metodológicos y de interpretación que, tomados en conjunto, evidencian una flagrante ruptura teoría-datos.

Palabras clave: Psicología, Salud, Teoría del desarrollo, Ecuaciones estructurales, Teoría, Datos.

In this article, a research paper is analysed, which was justified based on the theory of developmental psychopathology, the protective factors, self-regulation, resilience, and quality of life among individuals who lived with type 2 diabetes and hypertension. Structural equation modelling (SEM) was used for the data analysis. Although the authors conclude that the data are adequate to the theory tested, they commit errors of logic, concept, methodology and interpretation which, taken together, demonstrate a flagrant rupture between the theory and the data.

Key words: Psychology, Health, Development theory, Structural equation, Theory, Data.

Christie-Davies' Theorem: If your facts are wrong but your logic is perfect, then your conclusions are inevitably false. Therefore, by making mistakes in your logic, you have at least a random chance of coming to a correct conclusion. (Bloch, 1992; p.75)¹

L psychology is a discipline in the process of consolidation as a scientific enterprise that not only lacks a unique and consensual object of study, but it also lacks a single and consensual theory with which to represent the psychological conceptually at the basic level; i.e., one that includes phenomena such as attending, perceiving, remembering, thinking, reasoning, etc. What is needed is a theory whose purpose is to ensure systematic knowledge of these

or other phenomena, based on an observational and experimental methodology (Ribes, 2009a). The construction of other theoretical approaches will depend on the solid construction of this theory. Ribes (2005) has called this the intersection. Two of these stand out, on the phenomena of development and personality. At another level we include the theoretical models that are made with applicative purposes for various social problems, i.e., education (Ibáñez & Ribes, 2001), work or organizations (Rodríguez & Díaz-González, 2000) and health (Piña & Sánchez- Sosa, 2007; Ribes, 1990a), primarily.

As a starting point, we can say that the importance of a theory or a theoretical model lies in that it is easier to pave the way when analysing and interpreting the data produced by research... with *theoretical sense* (Figure 1). To do this, however, is a *sine qua non* that both are properly articulated conceptually, meaning that neither one nor the other should be considered as simple containers to which, due to the interest and/or short-term needs of the authors, concepts are added that are not part of the original structure.

This latter point is crucial because, surprisingly often and in a more pronounced way among those conducting applied research and using structural equation modelling (hereinafter SEM), the conceptual articulation often goes to the background. Thus, it is enough for someone insightful to justify a study based on SEM, for it to acquire *ipso facto* and by a kind of decree the character of "scientific"; consequently the findings acquire their supposed value to "explain" or "predict" something.² What is interesting is that a careful analysis will surely reveal that many of the investigations that are justified using SEM share the same original sin, which for obvious reasons does not make them worthy of the distinction of being scientific. This original sin is summarized as follows:

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¹ We advise the reader that, for the case study here analysed, the accuracy of the data is not in question; we do, however, question: a) their appropriate and correct statistical treatment, and b) the subsequent interpretation that is made of these data

² Moreover, the theoretical models for the purposes of the application of knowledge do not "explain", unlike general theories of process (psychological theories) which however do. The theoretical models in the field of health, because of the concepts they use (i.e., personality, motives, competencies, emotions, etc.) serve to "predict" how likely it is that a person will behave in a certain way in one circumstance and not in another (Piña, 2015a)



1. When an author starts with a logical error, surely
2. They will make another of a conceptual nature, giving way
3. To a methodological one, culminating
4. In one of interpretation.

A consecutive chain of errors that allows us to conclude that many of the investigations that rely on SEM are hermeneutic efforts which, technically speaking, favour what Ruiz, Pardo and San Martín (2010) characterized as *spurious relationships*: a lack of a causal relationship between two variables, including one that it is assumed will exist eventually with respect to a third variable.

Based on these considerations, the objective pursued in this work was to analyse a research report that was supported by SEM, which according to the authors (Gaxiola, Pérez & González, 2013) was justified in the theory of psychopathological development by Cicchetti (1990) and in the *sui generis* added concepts such as protective factors, self-regulation, resilience and quality of life in a sample of people living with type 2 diabetes and hypertension. We demonstrate that, the authors, by engaging in logical, conceptual, methodological and interpretative errors of the findings, are victims of excessive investigative euphoria which calls into question the overhyped relationship between the theory and the data.

THE THEORY OF PSYCHOPATHOLOGICAL DEVELOPMENT AND THE CONCEPTUAL ADDITIONS

Gaxiola et al (2013) published a research report that was justified in the theory of psychopathological development and the four aforementioned concepts, the participants being a group of people living with type 2 diabetes and hypertension. In principle, and due to its subsequent importance, we shall quote

extensively the authors' observations regarding some epidemiological characteristics of both diseases: [...] so, both conditions can occur in the same person. Hypertension is a condition that is growing and is a cause of disability in the Mexican population; among its consequences we can mention, for example, the development of other vascular diseases such as brain and vascular disease, coronary heart disease and sudden death [...] *In addition to the physical consequences of chronic degenerative diseases such as diabetes mellitus and hypertension, there is a decrease in the quality of life of those who suffer from them*³ (Gaxiola et al, 2013; p. 108).

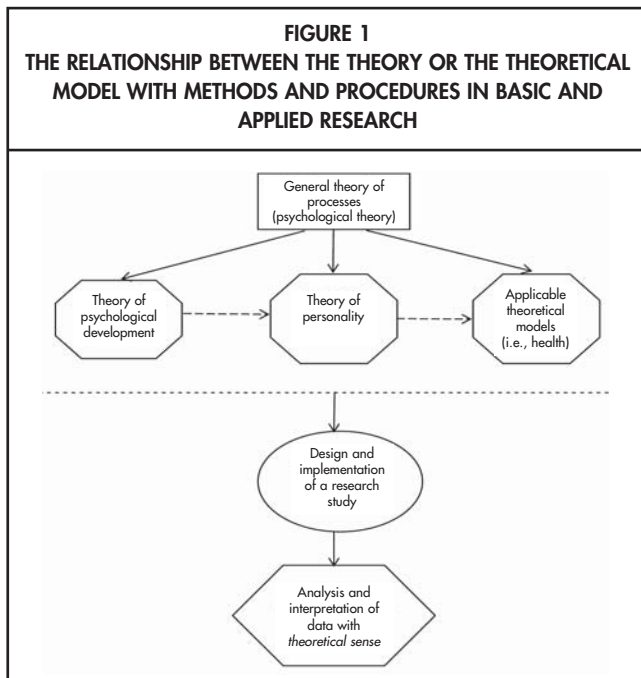
Then, on page 109, in the section entitled *Theoretical Framework: theory of psychopathological development*, they note the following: *psychopathological development theory emphasizes human development and its processes of adaptation and maladjustment [...] According to this theory, the interaction between the contextual, biological, psychological and social aspects affect normal and pathological development throughout life, resulting in some processes of adaptation and others of maladjustment [...]*⁴ Thus, the theory of psychopathological development is an *ecological theory* that can be used as a framework when studying the consequences of various diseases in people's quality of life [...] Vitality, pain and disability are all influenced by personal experiences and by the expectations of each person [...] In addition, considering that social support can affect the quality of life, it is possible that two people with the same health status have a different perception of it (Gaxiola et al, 2013; p. 109).

Abruptly and, as we shall see below, without any connection to the contents of the two quotations, in the section entitled *Protective factors and risk associated with quality of life* (pp. 109-110), the authors described:

1. The *protective factors*, which they defined as the conditions or environments capable of promoting the development of individuals and reducing the effects of unfavourable circumstances.
2. *Self-regulation*, defined as the set of processes that serve to continuously monitor progress towards a goal, checking the results and redirecting the effective efforts, as well as regulating the emotions.
3. *Resilience*, defined as a characteristic of human beings that makes us able to recover when faced with threatening situations.
4. These three factors, the authors say, contribute to promoting *quality of life*; this comprises the dimensions of perceived health and the social, individual and environmental circumstances surrounding people, emphasising their *degree of satisfaction*.

After this brief description of the *theory of psychopathological development* and the first three factors, in the method section the authors briefly describe the participants (n = 170) and the battery of instruments used, which included:

1. *The World Health Organization's Brief Scale on Quality of Life* (WHO, 1998), consisting of 26 questions with five response options on a Likert-type scale ranging from 1 (dissatisfied) to 5 (very satisfied). Four areas are considered,



³ The results highlighted in bold type have not been observed.

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- namely, physical health, psychological health, social relationships and environment.
- Resilience* (Gaxiola, Frías, Hurtado, Salcido & Figueroa, 2011), which has 24 questions with five response options on a Likert scale ranging from 1 (none) to 5 (totally). Seven dimensions were considered which included: positive attitude, sense of humour, perseverance, religiosity, self-efficacy, optimism and achievement orientation:
 - Protective Factors*,⁵ including 23 questions with five response options on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Two factors were considered: social support and neighbourhood cohesion.
 - Self-regulation* (Gioia, Iquith, Retzlaff & Espy, 2002), consisting of 30 questions with seven Likert-type response options, ranging from 1 (never) to 7 (occasionally). The areas that were measured were: inhibition and emotional control (emotional self-regulation), on the one hand, and flexibility and self-monitoring (behavioural self-regulation), on the other.

We mention the different factors, dimensions or areas that make up each instrument, because although a detailed analysis was expected of each one, regarding its influence on quality of life and the patients' condition in relation to the diagnosed disease, what the authors did was to extract the mean and total standard deviations of the instruments, i.e., they added the scores of the different subscales. Therefore, because the independent scoring of each subscale was omitted, we will demonstrate later why a methodological error was made with profound implications in the analysis and interpretation of the data (see Underwood, 1966). The total scores in question were as follows:

- Quality of life* (minimum and maximum possible scores ranging from 1 to 5 for each question): $M = 3.35$; $SD = 0.45$. Therefore, it could be argued that the participants "enjoyed" a good perception of their quality of life physically, psychologically and in their social and environmental relationships.
- Resilience* (minimum and maximum possible scores ranging from 1 to 5 for each question): $M = 3.99$; $SD = 0.63$. Therefore, it could be confirmed that the participants were resilient, i.e., they had an excellent positive attitude, a strong sense of humour, were perseverant, religious, self-efficient, optimistic and had appropriate goal orientation - all of these phenomena, whether psychological or not, form part of the instrument that supposedly measures resilience.
- Self-regulation* (minimum and maximum possible scores ranging from 1 to 7 for each question): $M = 1.71$; $SD = 1.23$. Therefore, one could argue that the participants did not have problems with emotional self-regulation (as they were uninhibited and had good emotional control) or behavioural

self-regulation (as they were flexible and they self-monitored permanently).

- Protective factors* (minimum and maximum possible scores ranging from 1 to 5 for each question): $M = 4.08$; $SD = 0.56$. Therefore, it could be confirmed that the participants were "protected" by having social support networks and neighbourhood cohesion.

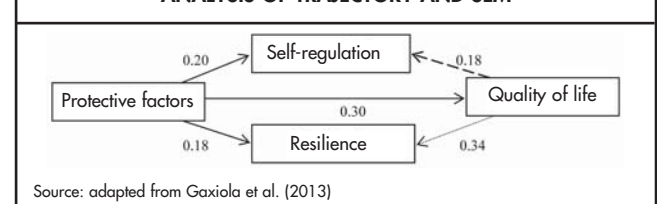
Considering these total scores, the authors proceeded to an analysis of the trajectory in SEM, the results of which were as follows: $\chi^2 = 72.8$; $gl. = 9$; $p = 0.50$; $BBNFI = 0.99$; $BBNNFI = 1.0$; $CFI = 0.98$; $RMSEA = 0.00$.⁶ For the reader that is not aware, except for the value of χ^2 (which must be $p > 0.05$), the remaining goodness of fit indicators are very close to statistical "perfection", although they are also very close to the theoretical-conceptual and methodological "imperfections". Based on these data, we proceed to examine why the authors, when starting from a spurious theory-data relationship, confused covariation with a causal relationship (Figure 2), and why their conclusions are incorrect and devoid of any support when interpreting the relationships: a) between variables; b) how they eventually affect the quality of life, depending on whether they are talking about participants diagnosed with diabetes or hypertension, and c) the consequences of both diseases on the quality of life, as established in the study objective.

THE FIRST MOMENT: LOGICAL AND CONCEPTUAL ERRORS

Ryle (1947/1967) indicates that a logical error consists of ensuring that a certain phenomenon exists and that it can be represented by a concept, which is supposed to be able to be related to other concepts. We will quote the author at length:

To achieve certain purposes, it is necessary to determine the logical connections of certain concepts whose use we know well [...] To determine the logical geography of concepts is to show the logic of the propositions that contain them, that is, to show which propositions are congruent or incongruent with them, which follow from them and which are inferred. The logical type or category to which a concept belongs is the set of modes or ways in which it can be used with theoretical legitimacy (Ryle, 1949/1967, pp.13-14).

FIGURE 2
ANALYSIS OF TRAJECTORY AND SEM



⁵On which no reference is provided.

⁶BBNFI (Bentler-Bonett Normed Fit Index; also known as NFI or Normed Fit Index); BBNNFI (Bentler-Bonett Non-Normed Fit Index, also known as NNFI or Non-Normed Fit Index); CFI (Corrected Fit Index); RMSEA (Root Mean Square Error of Approximation

⁷The suggested parameters for a good fit of the data to the "proven" theory include: a value of χ^2 $p > 0.05$ (absolute adjustment); BBNFI, BBNNFI and CFI 0.95 (comparative fit) and RMSEA 0.08 (reading Rodríguez, González and Ruiz, 2009 is recommended; Ruiz et al., 2010). As an additional note, there are other indicators of goodness of fit that the authors did not consider in their research work, such as the ratio between χ^2 and the degrees of freedom (which must be < 3), the goodness of fit index (GFI) and the corrected goodness of fit index (CGFI).



The logical geography of concepts presupposes that they have limits, which is why they cannot be surpassed, at the risk of making a confused use of them and ending up overlapping them with other concepts (Moore, 2001). In psychology and health, for example, motives, emotions, feelings and personality mean different things, so one would expect that no one would define the first based on the rest; like saying that a person's motivational states are highly "emotional" or that there is a motivating personality. The issue that we are emphasising is that, in starting from a logical error, it is common for authors to define the central concepts wrong in their investigations, with all that this implies.

In the present case, what ends up happening is that the relevance and proper use of concepts is replaced with a maxim that has acquired the hues of absolute truth in SEM, and which is usually summarized in articles as follows: the goodness of fit indicators show that the theoretical model fits the data!⁸ To sum up, regardless of the logical and conceptual problems, if the goodness of fit indicators are good, then the "theory" or "theoretical model" is good, as it is ensured that one or the other finds correspondence with the data.

THE SECOND MOMENT: THE THEORY OF PSYCHOPATHOLOGICAL DEVELOPMENT AND ITS CENTRAL CONCEPTS

You will recall that earlier, referring to the "theory" that presumably the authors used as a base, they mentioned that of psychopathological development by Cicchetti (2006), which they ensured is an *ecological theory*. Something that the authors should have had clear from the beginning is that not just anything is theory, or theoretical "say", nor can it be. A theory is not an arbitrary aggregate of concepts, as if it were some kind of container to which one can keep adding one or more other concepts indiscriminately. In addition, we consider it appropriate to warn the authors that it is always necessary to distinguish between different types of theories and theoretical models, as well as the goals they pursue.

A psychological theory, for example, that of Skinner (1953/1970), falls within the general framework of *process theories*; its purpose is to *describe* and *explain* how and why people behave in daily life, describing the system of relations between different types of events (Ribes & López, 1985; Roca, 2013). On this kind of theory, Ribes indicates that:

The theoretical process consists of how to infer from situations of particular fact to other situations of particular fact, how to explain situations of particular fact referring them to other factual situations (Ribes, 2009b; p.6).

In this context, the scientific knowledge gained in and by the practice of research would give *body*, *sustenance* and *empirical validity* to a theory, in order to be able to specify how the

relationship between a set of events (for example, the environment) and another set of events (e.g., behavioural) is to be interpreted. However we mentioned that there are other theoretical approaches such as those of development or personality, which unlike scientific theory *do not deal with processes*, but with the *results* of the processes. The results in the two theories are different: in that of development, the emphasis is on the emergence of transitions of behaviour in ecological and cultural contexts, that is, new forms of behavioural organization –i.e., competencies (Ribes, 1996); in that of personality, the emphasis is placed on the idiosyncratic, unique and singular nature with which each person, acting individually, comes into contact with situations in which no criteria are prescribed about what or how to respond –i.e., the tendency toward risk (Ribes, 1990b).

We mention both theories, because both that of development and that of personality not only have different purposes, but they can also be classified as technology-oriented theories. By definition, a technological type theory is justified with the deliberate purpose of *predicting* how likely it is that a person will develop with regards to competencies in the continuum of life, or whether, given certain personality characteristics, they will remain healthy or unhealthy. In this logic, the *theory of psychopathological development* –which is the product of many and varied issues and problems, that are represented by many different concepts– is unlikely to favour the conceptual articulation. Thus, without this, there is unlikely to be discursive consistency and, as a natural consequence, one or more authors take as their own the practice of incorporating, arbitrarily, concepts with different origin and content.⁹

Therefore, appealing to a theory such as *psychopathological development*, without explaining the contextual, biological, psychological and social factors that affect normal and pathological development throughout life and how they are defined, helps to understand why, in the authors' case, the best option at hand was to incorporate concepts such as protective factors, self-regulation, resilience and quality of life. As Lemos-Giráldez (2003) informs us, the evolutionary perspective that underlies the aforementioned theory presupposes that, in the continuum of development, multiple systems are gradually integrated in children and adolescents, including those of cognitive, emotional, social and biological types, that will in their constant interaction enable us to identify which mechanisms of vulnerability or protection are involved in both the development itself and the appearance of a specific "psychological" disorder.

Then, and in relation to the research analysed here, a series of first concerns that stand out on the *theory of psychopathological development* relate to how, to the knowledge and understanding Gaxiola et al. (2013):

⁸The results highlighted in bold type have not been observed.

⁹*Psychopathological development theory* by Cicchetti, is a theory about (adaptive or otherwise, pathological or otherwise) development, so it has more or less precise limits. That is, the theory arose in order to understand why children were at risk of developing schizophrenia, for which a focused development approach was required (Cicchetti, 1990). Also as Causadias and Carlson (2014) inform us, this theory picked up in its origin elements of psychoanalysis, genetic embryology, epidemiology, neuroscience, experimental psychology, developmental theories of Werner and Piaget, as well as attachment theory by Bowlby and Ainsworth. It is, in short, what we will call a *hybrid theory*.



1. It can be used with the declared aim of *assessing the relationship between social protective factors, self-regulation and resilience with the quality of life of patients with diabetes mellitus and hypertension* (Gaxiola et al objective, 2013; p. 110). First, the theory was formulated in order to study the origins and development of patterns of maladjustment regardless of the age of onset or the causes (Stroufe & Rutter, 1984), and not to study the relationship between a variety of factors, psychological or otherwise, regarding the care, maintenance, loss or recovery of health. Therefore, one cannot extrapolate a theory with a definite purpose to study certain types of relationships between certain variables and their potential effects on health and disease.
2. Also an explanation was deliberately omitted about the role the different factors play in the theory, such as the protective, self-regulation and resilience factors. These, moreover, we would like to make it clear to the authors of the study, are not even part of their conceptual framework, which means that they were added by the authors themselves outside of any logical or theoretical consideration.
3. But perhaps it would have been interesting if they were to clarify how those factors relate to two chronic non-communicable diseases, diabetes and hypertension, and in turn how these relate to quality of life.

These are not idle concerns or questions because, we must remember, if the authors' objective was to evaluate the relationship between social protective factors, self-regulation and resilience, and the quality of life of patients suffering from these two diseases, the reader would at least be expected to find some link between the facts or concepts, quality of life and diabetes-hypertension.

THE THIRD MOMENT: THE METHODOLOGICAL AND INTERPRETATION ERRORS

The problem is that the link mentioned at the end of the previous paragraph does not exist, at least theoretically, which is shown conclusively from this point on, when the results are summarized and *sui generis* interpretation of these made by the authors, who in the discussion section suggested the following; (we quote extensively because of its importance):

In the resulting model, the *protective factors*¹⁰ of social support and neighbourhood cohesion predict the self-regulation of patients with chronic diseases such as diabetes mellitus and hypertension, which implies that this psycho-biological type variable can be modulated by environmental factors; in turn, *self-regulation* predicts *quality of life*, which is possibly because the people in the sample are able to assess and control their behaviour, they choose the most appropriate action in order to improve and maintain a favourable state of health and they develop habits that subsequently affect how they perceive themselves [...] *Quality of life* as measured by the perception of patients with diseases such as diabetes mellitus type II and hypertension regarding various aspects of their lives, including their

health, is predicted by the level of their *self-regulatory capacity* [...] (Gaxiola et al, 2013; p. 116).

Also, on page 109, when the authors describe the protective factors associated with quality of life, they refer us to a wide variety of conditions that can favour or hinder people's development, while reducing the effects of unfavourable circumstances; these include neighbourhood cohesion and social support. Paradoxically, although the hybrid *theory of psychopathological development* pays special attention to the development of children and adolescents, we ask: how can you justify an investigation into a *theory of psychopathological development* without including in the analysis characteristics of children and adolescents behaving as individuals? But besides the obvious absence of the "protective" factors of people acting individually, note that in the structural model of trajectories shown in Figure 2, the only variable that had a direct influence on quality of life was precisely that of the protective factors, accounting for 15% of the total variance ($R^2 = 0.15$), a percentage that would certainly have been lower if it had considered the value of the adjusted R^2 ; Minor sins? However, note that, in the previous quote, in the authors' logic self-regulation predicts quality of life, which of course is illogical and contradictory, since the direction of the arrow starts with quality of life and ends in self-regulation (long dash arrow highlighted in bold). In other words, quality of life predicts self-regulation, not vice versa, as the authors claim in the previous quote.

Straight away, and surprisingly, the authors add the following:

It was also found, as in other investigations [...] that the *protective factors predict*¹¹ *resilience* because, in their development, some people interact with the protective factors that allow them to construct and remain behaving in "adaptive niches" [...] and strengthen their willingness to resilience. This means that despite the existence of a condition, the interaction with protective factors enables the development of a number of tendencies that empower people with regards to the risks they face, in this case, those established due to suffering from type II diabetes and/or hypertension (Gaxiola et al, 2013; pp. 116-117).

If the protective factors constitute a variety of items that are available in the repertoire of a person due to their contact with objects, events and other people in the environment, in the logic of Gaxiola et al. (2013) the protective factors that they contemplated would be included in the ecological-social context, to the extent that it is guaranteed that both social support and neighbourhood cohesion "protected" people with diabetes and hypertension. But, as we just discussed, in the absence of the protective factors of the person acting individually, how can you explain the influence of development –defined as transitions in which new behavioural processes emerge from the previous ones– on the changes in the tendency to behave in one way or another in the continuum of life? If the authors justify a research study with a theory, that of *psychopathological development*, it is strange that the use of conceptual categories has been deliberately omitted in relation to development in the terms set out above. The theory in question was lost on the way, just like

¹⁰ Highlights in italics and boldface our own.

¹¹ Highlights in bold have not been observed.





the characterization of the phenomenon of development. The most interesting thing about this latter point is that if *protective factors* predict *resilience*, by the fact that people in their *development* interact with protective factors that strengthen the willingness to resilience (previous quote), a reading on the subject of the concept of resilience, in which the first author appears (see Gaxiola et al, 2011), shows us that:

Resilience or adaptability is thus defined as the ability to display adaptive responses to risk conditions [...] which combines a set of personal attributes acquired through psychological development and from contact with protective factors available in the settings of the people at risk. *Resilience is an inference based on individual differences with regard to the stress response or adversity*¹² [...] for that reason, it is a latent order variable [...] which can be inferred from the observed indicators related to dispositional modes (Gaxiola et al, 2011; p.74).

The reader will notice that the same logic prevails in this quote and the previous one, namely that of ensuring that the development is there, as if it were the “sound board” of the protective factors that literally compel people to be resilient. Then, no categories are required for the phenomenon of the development of people acting individually, but quite simply those that are defined as protective factors and resilience are required. However, we now ask, from what and/or against what did the protective factors “protect” the people with hypertension and diabetes? Against the risks they face, those established by the fact of having one of these diseases? And what are these risks that they mention? Do they refer perhaps to the behaviours that correlate with each of these diseases, those known as behaviours associated with the disease? That is, following Ribes (1990a):

1. Do they refer to behaviours that are the effect of a biological disease?
2. Ones that are derived from therapeutics?
3. Or perhaps they are linked indirectly to the first?

It is not known to which of these behaviours they refer, because nowhere in their work did they attempt the task of minimally describing them. Yes, they do protect against risks that are there, just due to the fact of having one of these diseases! The picture is further complicated when the authors claim that quality of life also predicts resilience, as can be seen with the arrow highlighted with bold and continuous points. Just let us quote the authors extensively again, regarding this unusual finding:

[...] But in this study an inverse relationship was tested and found, i.e., that quality of life influences the development of resilience. *This can be justified because quality of life is a global construct that measures satisfaction with different aspects in the different areas of everyday life*, that is, you can be satisfied with specific aspects related to quality of life and this satisfaction is a protective factor that enables the development of resilience.¹³ In other words, the increase in quality of life allows people to overcome the suffering they face more

easily, as supported by the results found. This is a novel relationship that requires further investigation (Gaxiola et al, 2013; p. 117).

Justifying that quality of life is a global construct is something like ensuring that psychology studies the psychological; a truism, no more, no less. It is absurd to speak of the existence of global constructs, as if it were possible to differentiate them from other constructs that are not global and that, therefore, we would say are non-global, particular or specific. That quality of life is a multidimensional concept is not the same as saying that it is global simply because it involves different dimensions in its content, ergo, the biological, psychological and social dimensions. In addition, quality of life is the *functional result of the combined set of biological, socioeconomic and psychological conditions that people experience at a particular moment on the interaction continuum* (Carpio, Pacheco, Flores & Canales, 2000; p.4), so, as much as it results in different conditions, quality of life, which comprises the perception of health and the social, individual and environmental circumstances surrounding people, cannot be predictive of resilience. If this is a concept that strictly speaking does not belong to the phenomenology of the psychological and is also incorrectly defined (Piña, 2015b), then, we propose a series of basic questions for the authors: which of the seven dimensions contained in the instrument used was associated causally with the quality of life and with the health status of the participants? Was it religion? Perseverance? Self-efficacy? Sense of humour? Optimism? Positive attitude? Or goal orientation? Or maybe two or more of them interacted?

Allow us to quote the authors:

[...] the research did not ask how many participants had concomitant diseases related to the diabetes and hypertension they suffered from. Nor was the diversity evaluated of the pharmacological or other treatments they were receiving [...] Moreover, the relationships found between the variables were modest (although significant), so one must be cautious with their implications (Gaxiola et al, 2013; pp. 117-118).

Common sense and empirical evidence tell us that at the time the participants were evaluated:

1. Given the type of disease;
2. The time since diagnosis;
3. The time elapsed from the start and especially the type of treatment to which each participant had been exposed or was undergoing;
4. Their health condition, i.e., whether the disease was under control or had shown some clinical progression, among many other things ...

...makes the assumption untenable that they worked with a sample of 170 participants with homogeneous health, disease, psychological and socio-environmental characteristics. Indeed, any researcher who has conducted a study with patients that are diabetic hypertensive patients suffering from some form of cancer, gastrointestinal diseases, HIV infection, etc., will know that the evidence supports that there are significant variations among patients in the content of points 1, 2 and 3, such that it

¹² Highlights in bold have not been observed.

¹³ Highlights in bold have not been observed.





is all but impossible to accept the assumption of “normality” in the set of characteristics mentioned in the final part of the previous paragraph (see Ballester, Gil, Gil-Juliá & Gómez, 2012; Caballero, Pérez, Herrera, Manrique & Sánchez-Sosa, 2012; García & Sánchez-Sosa, 2013; Garduño, Riveros & Sánchez-Sosa, 2010; Méndez, Mejía, Laborín & Piña, 2014).

FINAL COMMENTS

In several countries around the world, analytical studies have been published on SEM, its advantages and disadvantages, in particular on the most common problems that often become visible in research reports (Kelloway, 1995; Ruiz et al, 2010; Tanaka, 1993): an absent or poor theoretical justification, conceptual shortcomings, errors of interpretation regarding causal relationships -when they are and when they are not, the value and the weight that must be assigned to the goodness of fit indicators, etc. Certainly, we only get the impression that these analytical studies have not reached, in general, the health psychologists in countries like ours; however, all research reports that are based on SEM should keep them in mind, as a rule and not as the exception.

Unfortunately psychology in Mexico has distinguished itself, at least over the last two decades, by a sort of scientist paraphernalia in which the statistical analysis of the latest generation (i.e., SEM) has gained primacy over issues of a theoretical and conceptual nature. The worrying thing is that this scientist paraphernalia has taken on unsuspected proportions, especially among those who use and abuse the statistical procedures (Piña, 2003), and in particular, as in the present case, SEM (Piña, 2015c). In the framework of the research study analysed, starting from a theory that fulfils a purpose and transferring it without any logical or conceptual consideration to predict a supposed relationship among various factors of quality of life -without any assessment of the health-sickness condition-, is quite simply unjustifiable. The *theory of psychopathological development*, having logical and conceptual boundaries as well as specific purposes, cannot replace, no matter whether various concepts are added, phenomena of a psychological nature that are essential in the field relating psychology to health: personality, motives, competencies, moods and behaviours associated with the disease, to name a few. Therefore, while psychologists remain committed, at least in our country, to:

- a) Confusing the psychological with whatever they have to hand;
- b) Justifying its study because they have a methodological support tool, SEM, and
- c) Carrying out analyses and producing different conclusions without foundations.

All that this will cause, as has happened with the author of this study, is a deep sense of *psychological helplessness* when observing how easy it is to popularize psychology and the psychological; of course, all in the name of science and SEM!

Finally, it should be stressed here that we are not denying either the relevance or the potential value of SEM in psychology and health, examples of whose correct use (although in our country less so), can be found in the specialised literature (i.e., González & Landero, 2008; González, Landero & Ruiz, 2008; Moral de la Rubia & Miaja, 2015). What is emphasized is that it is essential to respect the basic criteria for the use of SEM to be correct:

- 1) In the case of social (health) problems, one must have a relevant applicable theoretical model that has an articulated body of concepts that clearly identify the psychological processes, states and outcomes.
- 2) The extrapolations of the data find their reason for being in the theory and concepts, which means that the data and their interpretation cannot go beyond what the theoretical model and its conceptual categories “say”.
- 3) The measurement of the goodness of fit indicators can be tested with the saturated model and, on the recommendation of one of the reviewers, it is understood what a good fit to the data consists of. Otherwise what ends up happening, as in the study analysed, is that the purpose of a theory is confused and the central concepts misused, encouraging the language of the data to constitute the node and not a methodological support tool for research in the field of action.

REFERENCES

- Ballester, R., Gil, M.D., Gil-Juliá, B. & Gómez, S. (2012). Adherence to treatment in Spanish HIV patients: Psychological profile associated with adherence behavior. In C.H. García-Cadena, R. Ballester & J.A. Piña (Eds.), *Chronic diseases and medication adherence behaviors: Psychological research in Ibero-American countries* (pp. 175-201). Hauppauge, NY: Nova Science Publishers.
- Bloch, A. (1992). *El libro completo de las Leyes de Murphy* [The complete book of Murphy's Laws]. México: Diana.
- Caballero, N.P., Pérez, I.N., Herrera, M.A., Manrique, M.O. & Sánchez-Sosa, J.J. (2012). Efectos de una intervención cognitivo-conductual sobre la adhesión terapéutica y regulación emocional en pacientes con enfermedades gastrointestinales [Effects of a cognitive behavioral therapy intervention on adherence and emotional regulation in patients with gastrointestinal diseases]. *Psicología y Salud*, 22, 257-273.
- Causadias, J. & Carlson, E. (2014). La psicopatología del desarrollo y la teoría del apego [Developmental psychopathology and attachment theory]. In B. Torres, J. Causadias & G. Posada (Eds.), *La teoría del apego: Investigación y aplicaciones clínicas [Attachment theory: Research and Clinical Applications]* (pp. 113-127). Madrid: Psimática Editorial.
- Carpio, C., Pacheco, V., Flores, C. & Canales, C. (2000). Calidad de vida: un análisis de su dimensión psicológica [Quality of life: An analysis of its psychological dimension]. *Revista Sonorense de Psicología*, 14, 3-15.
- Cicchetti, D. (1990). A historical perspective on the discipline of developmental psychopathology. In J. Rolf, A. Masten, D. Cicchetti, K. Nuechterlein & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 228). New York, NY: Cambridge University Press.
- Cicchetti, D. (2006). *Developmental psychopathology. Theory and method theory. Vol. 1* (2nd Edition). New York, NY: John Wiley & Sons.
- García, R. & Sánchez-Sosa, J.J. (2013). Efectos de la entrevista motivacional en el tratamiento de la diabetes mellitus tipo 2 [Effects of motivational interviewing in the treatment of diabetes mellitus type 2]. *Psicología y Salud*, 23, 183-193.
- Garduño, C., Riveros, A. & Sánchez-Sosa, J.J. (2010). Calidad



- de vida y cáncer de mama: efectos de una intervención cognitivo-conductual [Quality of life and breast cancer: The effects of a cognitive-behavioral intervention]. *Revista Latinoamericana de Medicina Conductual*, 1, 69-80.
- Gaxiola, J.C., Frías, M., Hurtado, M.F., Salcido, L.C. & Figueroa, M. (2011). Validación del inventario de resiliencia (IRES) en una población del noroeste de México [Validation of the IRES resilience inventory in a population of northwestern Mexico]. *Enseñanza e Investigación en Psicología*, 16, 78-83.
- Gaxiola, J.C., Pérez, R.F. & González, S. (2013). Resiliencia, autorregulación, factores protectores y calidad de vida en personas con diabetes mellitus tipo II e hipertensión arterial [Resilience, self-regulation, protective factors and quality of life in people with type II diabetes mellitus and hypertension]. In J.C. Gaxiola & J. Palomar (Coords.), *Estudios de resiliencia en América Latina, volumen 2 [Studies of resilience in Latin America, Volume 2]* (pp. 107-120). México: Universidad de Sonora/Universidad Iberoamericana/Pearson.
- Gioia, A., Iquith, K., Retzlaff, D. & Espy, A. (2002). Confirmatory factor analysis of the behavior rating inventory of executive functions (BRIEF) in a clinical sample. *Child Neuropsychology*, 8, 249-257.
- González, M.T. & Landero, R. (2008). Confirmación de un modelo explicativo del estrés y de los síntomas psicósomáticos mediante ecuaciones estructurales [Confirmation of a descriptive model of stress and psychosomatic symptoms using structural equations]. *Revista Panamericana de Salud Pública*, 23, 7-18.
- González, M.T., Landero, R. & Ruiz, M.A. (2008). Modelo estructural predictor de la salud mental y física en mujeres [Structural model for predictors of mental and physical health in women]. *Revista Panamericana de Salud Pública*, 23, 101-108.
- Ibáñez, C. & Ribes, E. (2001). Un análisis inter-conductual de los procesos educativos [An interbehavioral analysis of educational processes]. *Revista Mexicana de Psicología*, 18, 359-371.
- Kelloway, E.K. (1995). Structural equation modeling in perspective. *Journal of Organizational Behavior*, 16, 215-224.
- Lemos-Giráldez, S. (2003). La psicopatología de la infancia y la adolescencia: consideraciones básicas para su estudio [Psychopathology in childhood and adolescence: Basic considerations for study]. *Papeles del Psicólogo*, 24, 19-28.
- Méndez, J., Mejía, R., Laborín, J.F. & Piña, J.A. (2014). Adhesión en mujeres con cáncer del Perú [Adherence in women cancer patients from Peru]. *Gaceta Mexicana de Oncología*, 13, 117-123.
- Moore, J. (2001). On psychological terms that appeal to the mental. *Behavior and Philosophy*, 29, 167-186.
- Moral de la Rubia, J. & Miaja, M. (2015). Contraste empírico de las cinco fases de duelo de Kübler-Ross en mujeres con cáncer de mama [Empirical testing of the five stages of grief by Kübler-Ross in women with breast cancer]. *Pensamiento Psicológico*, 13, 7-25.
- Piña, J.A. (2003). Uso y abuso de los análisis cuantitativos en la investigación psicológica [The use and abuse of quantitative analysis in psychological research]. *Enseñanza e Investigación en Psicología*, 8, 349-361.
- Piña, J.A. (2015a). Teorías generales y modelos psicológicos: su relación con la aplicación del conocimiento en el ámbito de la salud [General psychological theories and models: their relation to the application of knowledge in the field of health]. In E. Camacho, L. Reynoso & J.A. Piña (Coords.), *Análisis teórico y experimental en psicología y salud: algunas contribuciones mexicanas [Theoretical and experimental analysis in psychology and health: Some Mexican contributions]* (pp. 17-43). Guadalajara, México: Instituto Tecnológico de Estudios Superiores de Occidente/Universidad de Sonora.
- Piña, J.A. (2015b). Un análisis crítico del concepto de resiliencia en la psicología [A critical analysis of the concept of resilience in psychology]. *Anales de Psicología*, 31, 751-758.
- Piña, J.A. (2015c). *Psicología y salud: obstáculos y posibilidades para su desarrollo en el siglo XXI [Psychology and health: Obstacles and opportunities for development in the twenty-first century]*. Hermosillo, México: Editorial de la Universidad de Sonora.
- Piña, J.A. & Sánchez-Sosa, J.J. (2007). Un modelo psicológico para la investigación de los comportamientos de adhesión en personas con VIH [A psychological model for the investigation of adherence behaviour in people with HIV]. *Universitas Psychologica*, 6, 399-407.
- Ribes, E. (1990a). *Psicología y salud: un análisis conceptual [Psychology and health: A conceptual analysis]*. Barcelona: Martínez Roca.
- Ribes, E. (1990b). La individualidad como problema psicológico: el estudio de la personalidad [Individuality as a psychological problem: The study of personality]. *Revista Mexicana de Análisis de la Conducta*, 16, 7-24.
- Ribes, E. (1996). Reflexiones sobre la naturaleza de una teoría del desarrollo del comportamiento y sus aplicaciones [Reflections on the nature of a theory of behavioral development and applications]. In S.W. Bijou & E. Ribes (Coords.), *El desarrollo del comportamiento [Behavioral development]* (pp. 267-282). Guadalajara, México: Universidad de Guadalajara.
- Ribes, E. (2005). Reflexiones sobre la eficacia profesional del psicólogo [Reflections on the professional efficacy of the psychologist]. *Revista Mexicana de Psicología*, 22, 514.
- Ribes, E. (2009a). La psicología como ciencia básica. ¿Cuál es su universo de investigación? [Psychology as a basic science. What is its research universe?] *Revista Mexicana de Investigación en Psicología*, 1, 7-19.
- Ribes, E. (2009b). Reflexiones sobre la aplicación del conocimiento psicológico: ¿Qué aplicar o cómo aplicar? [Reflections on the application of psychological knowledge: What to apply and how to apply it?] *Revista Mexicana de Análisis de la Conducta*, 35, 3-17.
- Ribes, E. & López, F. (1985). *Teoría de la conducta: un análisis de campo y paramétrico [Theory of behaviour: a field and parametric analysis]*. México: Trillas.
- Roca, J. (2013). Ciencias de la conducta: objeto material y objeto formal [Behavioural Science: material object and formal object]. *Conductual: Revista Internacional de Interconductismo y Análisis de la Conducta*, 1, 4-15.
- Rodríguez, M.L. & Díaz-González, E. (2000). La incidencia del psicólogo en el campo del trabajo [The incidence of



- psychologists in the field of work]. *Investigación y Desarrollo*, 14, 74-89.
- Rodríguez, M.N., González, M.T. & Ruiz, M.A. (2009). Path analysis models versus latent variable models: Examples from educational and health approaches. *International Journal of Hispanic Psychology*, 2, 91-110.
- Ruiz, M.A., Pardo, A. & San Martín, R. (2010). Modelos de ecuaciones estructurales [Structural equation models]. *Papeles del Psicólogo*, 31, 34-45.
- Ryle, G. (1949/1967). *El concepto de lo mental [The Concept of Mind]*. Buenos Aires: Paidós.
- Skinner, B.F. (1953/1975). *Ciencia y conducta humana [Science and human behaviour]*. Barcelona: Fontanella.
- Stroufe, L.A. & Rutter, M. (1984). The domain of developmental psychopathology. *Child Development*, 55, 17-29.
- Tanaka, J.S. (1993). Multifaceted conception of fit in structural equation models. In K.A. Bollen & J.S. Long (Eds.), *Testing structural equation models* (pp. 10-39). Newbury Park, CA: Sage.
- Underwood, B.J. (1957). *Psychological research*. New York, NY: Appleton-Century-Crofts.
- Underwood, B.J. (1966). *Problems in experimental design and inference*. New York, NY: Appleton-Century-Crofts.
- WHO (1998). The WHOQol-Brief: Development and general psychometric properties. *Social Science & Medicine*, 46, 1569-1585.

Letter to the Editor



Dear Editor, Associate Directors, and members of the Editorial Board of *Psychologist Papers*:

In the latest issue of the journal *Papeles del Psicólogo [Psychologist Papers]* (June 2016), there is an opinion article on Positive Psychology with a title that, from the outset, seems offensive and unbecoming of a professional or academic journal ("*Mitos de la Psicología Positiva: Maniobras engañosas y pseudociencia*" ["*Myths of Positive Psychology: Deceptive manoeuvres and pseudoscience*"]). As collegiate psychologists and also members of the scientific and academic community, we wish to express our repulse of the repeated use of this professional platform to attack the reputation of a psychological movement, sponsored and promoted by colleagues (yours and ours), both nationally and internationally.

Leaving aside the intellectual weight of the criticisms, it seems entirely inappropriate that the professional journal of the Spanish Psychological Association should repeatedly allow articles that are loaded with deeply biased denigrating judgments from start to finish. In the latter case, this bias is evident from the very title of the article, and it continues to pour out opinions that are not backed by scientific data or arguments but by a hurtful animosity that causes at times surprise and at times, why not admit it, unintentional hilarity. Thus, previously-read arguments are repeated such as the one on how Positive Psychology speaks of "authentic trivialities" and is "scientific short change" in which "too much unfounded speculation, interpretative alchemy and linguistic hermetism" (sic) is observed. 136. It also represents nothing less than a "betrayal of virtue epistemology [sic], and a lack of professional honesty" (p.138), making it a "psychological frustration and social disillusionment" (p. 138) and, in short, turning its "affective narratology" (sic) into "repetitive knowledge, full of common sense, and unwritten philosophy from popular proverbs" (p.140). This is the intellectual tone of the article, an epigone of similar previous ones, the likes of which it is difficult to find in the professional or scientific journals that we know. We resist the urge to produce new written rebuttals which would result in continuing to bolster the meagre resumes of others.

We sign this letter as (current and past) presidents of the Spanish Society of Positive Psychology, joined unanimously by the Board of the Association, and attending to its statutes in Art. 3, Section 5, which indicate that one of the aims of the association is to "promote the good image of Positive Psychology and to ensure the ethical and appropriate application of the knowledge and applications derived from it."

We believe, and we hope you will agree, due to the appreciation you deserve from us personally and due to the prestige of our journal, that a disservice is being done to the profession –and to critical, constructive thinking, which should be based on scientific and respectful language– in continuing to promote the disparaging criticism of colleagues in our profession who try to use the best scientific and professional standards, as unquestioningly do all of you in producing and promoting your work.

Sincerely,

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 Former President of the Spanish Society of Positive Psychology (SEPP)
 Former President of the International Association of Positive Psychology (IPPA)

Marisa Salanova
 Professor of Positive Organizational Psychology
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Board of the Spanish Society of Positive Psychology (SEPP)

