



Theorem of Union of Axiological Systems (TUAS)

Francisco Parra-Luna¹, Antonio Caselles² and Felix Martinez de la Rosa³

¹Universidad Complutense de Madrid, Avda. de Séneca, Ciudad Universitaria 28040 Madrid

²U.Valencia, Av. de Blasco Ibáñez, 13, 46010 València, Valencia, España

³Universidad de Cádiz, Department of Mathematics. Centro Cultural Reina Sofía - C/ Paseo Carlos III

Correspondence author; parraluna3495@yahoo.es

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Short Letter

It is known that all scientific knowledge, although always open and provisional, is presented as factual, precise, verifiable, predictive... as well as applicable, or useful among other characteristics, which are precisely those that define the concept of "Theorem" as a "proposition" that is mathematically provable by means of axioms. A theorem is, then, a proposition whose truth is demonstrated, or any proposition that starting from an axiomatic assumption, asserts non-self-evident reasonableness (Lalande). For this reason, it would come to fulfill a role of "light" and "guide" in human activities, which is what the "Theorem of Union of Axiological Systems" (TUAS) proposed in this work, intends. In an ongoing development by the team of AVANCES SISTÉMICOS, this theorem will be applied, albeit exploratory, to the problem of the Russia-Ukraine war.

1 Introduction

It is also known that there are various types of theorems in social sciences such as the Stolper-Samuelson theorem in Economics (imports from poor countries lower wages in rich countries), or the Modigliani-Miller (the greater the debt of the countries, the higher cost to obtain capital) that are supposed to be based on empirical research; or still others in Sociology such as Thomas's Theorem (if something is perceived as real it has real consequences); or Arrow's Impossibility (they cannot satisfy "n" simultaneously incompatible needs); or the one formulated as the Possibility Theorem by Salvador Giner (as a criticism of Arrow's) which bases it on the role that unconsidered "altruistic" attitudes would play.

Based on these different elaborations, what we will call the Theorem of Union of Axiological Systems (TUAS), will be presented and for which it will be necessary to first describe what is meant by this last type of system. We will call "axiological systems" the entities (individual or social) that pursue, sociobiologically

determined, the nine values of a Referential Pattern of Universal Values (RPUV), whose components would be:

Definition 1: The Referential Pattern of Universal Values (RPUV) registers the desired/obtained achievements in the following “end-values”: *Health (y1), Material Wealth (y2), Security (y3), Knowledge (y4), Freedom (y5), Distributive Justice (y6), Nature Conservation (y7), Quality of Activities (y8), and Moral Prestige (y9)*. Nine “end-values” that would be pursued and realized to some extent by all human beings on Earth in no matter what time or place, there being no way to avoid them as human beings. And with a purpose, be it conscious or unconscious, innate: to pursue **progress**.

What is progress? The concept of progress (P) requires two changes or requirements over time:

First requirement: that the average (Y) of the 9 levels at a given moment “2” has increased with respect to a previous moment “1”. Thus, if $(y_{11}+y_{21}+\dots+y_{91})/9=Y_1$; where “y11” is the level reached by value “1” at the time “1”, and “y91” is the level of value “9” at time “1”. Then, applying the same formula, the average level reached at time “2” will be: $(y_{21}+y_{22}+\dots+y_{29})=Y_2$; so the first requirement of the concept of Progress (P) will be to fulfill that $Y_2>Y_1$. The higher the levels of the “Y”, the higher the **progress** achieved.

Second requirement: that “DY2”_i“DY1”, where “D” is an expression of the mean deviation between the levels of the 9 values of the PRVU, and the higher the levels of “D”, the lower the progress achieved. Therefore, and since “D” must reduce progress, it must enter as the denominator of “Y”, for which we will do: $D=1+v/100$ where “v” is the average deviation (arithmetic, geometric...) of the levels achieved of the nine “values-ends” of the RPUV.

Therefore, in the most summarized way possible: if $[(Y_2/D_2)]/[(Y_1/D_1)] >1$ there is progress; if <1 there is regression; and if $=1$ stagnation.

Definition 2: We will therefore call “axiological systems” the entities (individual or social) that inevitably pursue the nine values of the Referential Pattern of Universal Values (RPUV).

Definition 3: Human beings only progress (P) if they manage to increase, and in a balanced way, the average of the nine values-ends cited from the RPUV, Under these principles it is then possible to state our Theorem of Union of Axiological Systems (TUAS), which are nothing but “human systems”, but with due emphasis on the “value-ends” pursued.

Conjecture (Union of Axiological Systems) Let A and B be two axiological systems that pursue progress (P) through the optimization of the RPUV in the nine aforementioned components. Then, when two axiological systems are united, the progress (P) achieved by the new united system will be greater than the sum of the progress of systems A and B without their union. Formally: $P(A \cup B) > P(A) + P(B)$, where the symbol “U” stands for the union.

Demonstrative syllogism (Table 1):

Table 1: A theoretical verification of the Theorem of Union of Axiological Systems (TUAS)

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| <ol style="list-style-type: none">1. The axiological systems, sociobiologically determined, can only pursue their own progress.2. To this end, the axiological systems are united with at least one other.3. Then, this union of axiological systems is what allows them greater progress. |
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2 Deduction of the theorem

Obviously, premises 1 and 2 are accepted as axioms. Strictly speaking, there could be some axiological system that does not pursue its own progress, but in this case, it would perish and its consideration would not fit. Also, strictly speaking, there could be some axiological system that did not join with any other

throughout its existence, but it would be such an isolated case (a Robinson Crusoe) that in practice it would not exist. Similarly, any axiological system may not join another in particular and even separate from another when the corresponding study has been done and the sum of their progress separately exceeds the sum of their progress being united. But in none of these three cases is the fact that if two systems remain united it is because they are interested, thus verifying the Theorem of Union of Axiological Systems (TUAS).

Taking into account, then, that the progress (P) pursued starts from the vectors of relative levels (y) (eg, between “0” and “100”) reached by systems A and B in each of the 9 values- purposes of the RPUV, then their averages would be

$$P(A)=(y1A+y2A+y3A+y4A+y5A+y6A+y7A+y8A+y9A)/9$$

$$\text{and } P(B)=(y1B+y2B+y3B+y4B+y5B+y6B+y7B+y8B+y9B)/9$$

And if we call “I” the new integrated system of A and B, the axiological profile of the new united system will be the resulting average in each of the values, plus the emerging differential (d) resulting both from the union itself and from the decrease in the joint mean deviation of “YA” and “YB”, then:

$$P(I)=[(y1A+y1B)/2]+d1; [(y2A+y2B)/2]+d2; \dots \dots \dots [(y9A+y9B)/2]+d9;$$

Being $d1+d2+\dots+d9$ the total increase in progress (P) is derived from the union of both axiological systems, and whose sum is always positive although some increases may be negative). Where do the differences “d” come from, or how are they explained? At the moment there are no concrete data available (at least by the authors), but the history of the development of peoples shows us, with little room for doubt, that the numerous experiences of collaboration, cooperation, and complementation between all kinds of beings or of groups, animals or humans, have been proving successful. From the mere intersexual pairing for the conservation of species to the organization of the United Nations for political purposes, going through all sorts of organized human groups (friends, cooperatives, companies, political parties, unions of countries, etc., widely leave verified the progress achieved historically, with exceptions, through this generalized union of axiological systems The case of the European Union (EU) that was formed in 2002 from the creation of the European Coal and Steel Community (ECSC) in 1952 demonstrates its success, which is also verified by the permanent call of the Eastern European countries to join the EU But, we repeat, no exception would invalidate the “eternity” of the TUSA, since the “union” itself (U), or proves its usefulness, or ceases to exist. The formula $P(A \cup B) > P(A) + P(B)$ can thus be given as true, where “P” is “axiological progress” and “A” and “B” are individual axiological systems

3 Conclusions

The *Theorem of Union of Axiological Systems (TUAS)* would fulfill the function of guiding people to collaborate together forming social systems. This is so since both, individuals and groups, only seek to improve (raise and/or balance) their respective axiological profiles, which is what any effective union achieves for this purpose. Think, for example, of the global benefit it would bring, in the current situation of the war in Ukraine, if Russia decided to stop the war and apply to join the European Union (see “Putin’s Dilemma” in ABC newspaper, 3.28.2022). Most of the great problems of the moment on the planet, firstly **human** (deaths, injuries, refugees, ...) and secondly **economic** (energy supplies, cancellation of sanctions, inflation...) would be automatically stopped or solved. This could be the first positive effect of the presented Theorem.

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About the Author



Francisco Parra Luna, Catedrático Emérito of Sociology, Licenciado in Political Science (Geneva University); PhD in Sociology (University of Lausanne); Ex-President of Sociedad Española de Sistemas Generales (SESGE) and now President of Honor; Founder and Director of the Instituto Universitario de Recursos Humanos de la Universidad Complutense; Coordinator of the Theme “Cybernetics and Systems” within the Internacional Encyclopedia of Life Support Systems of UNESCO;. Editor of the Bulletin AVANCES SISTÉMICOS. Author of 21 books on theoretical and methodological aspects of social systems, like “Towards Comparing National Social Performances”, Univ.Lausana, 1975; “Elementos para una Teoría Formal del Sistema Social”, Ed. UCM,1983 and de “The Performance of Social Systems”: Problems and Perspectives”, Ed. Wiley, N.York, .2001. He has published about 50 articles in professional journals, among them: “An Axiological Systems Theory: Some Basic Hypotheses”, in Systems Research and Behavioral Sciences, 00,(2001); “ and several of his Works have been honoured. He is “favorite son” of Villanueva de los Infantes, Ciudad Real, Spain, where he has a square dedicated to him in the town.



Antonio Caselles, retired professor of the Department of Applied Mathematics of the Universitat de València. He was a professor of the Permanent Seminar of Systems (formerly School of Operations Research of which he was director between 1992 and 1997). Vice-president from 2009 to 2014 of the Spanish Society of General Systems. Editor and director of the International Journal of Systems (Organ of the Spanish Society of General Systems) between 2009 and 2014.



Felix Martinez de la Rosa, is a Professor of Mathematics, Department of Mathematics, University of Cadiz. He has a research Group: Interactive Science, Technology, Engineering, and Applied Mathematics. Author of several books, Main subject area: Applied mathematics.