

Transdisciplinarity of Physics, Philosophy, Economics, Law, Psychology and Politics applied to Public Administration

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Abstract

Transdisciplinarity can be understood basically as the dialogue of opposite poles, as the interaction and the integration of opposites (dualities), considering dialectics between specialists and generalists, between the analytical and synthetic method. The main objective of this study is to evidence transdisciplinary as a tool for problem solving, as applied knowledge and understanding of reality, more than the mere intellectual view. The methodology adopted was based on Jungian psychology and in the MBTI System. Two schematic models were elaborated: 1) Duality and four elements as troubleshooting requirements and 2) difference between knowing (rational aspects) and understanding (a broader concept involving rationality, reasonableness, feasibility and meaning). As for Model 1, the idea is the integration and interaction of opposites in a dialectics approach, considering also the four archetypical elements translated into four requirements for troubleshooting managerial problems. Those are connected to Jungian functions: sensation, feeling, thinking and intuition, which were translated by this author into management requirements of feasibility, reasonableness, rationality and meaning, respectively. This approach considers not only psychology, but also Plato's philosophy, physics and the alchemical tradition. This emerging paradigm that considers all the transdisciplinary epistemic forms: technoscience, philosophy, tradition and art. The core is the dialogue of opposites, between specialists and generalists, between the analytical and synthetic method, to create a unit of applied knowledge, the understanding of the reality to solve problems effectively, not only in an intellectual and mechanistic view. Also this paper shows examples of applied transdisciplinarity in public management starting from the point of view of following disciplines: i) Physics with Philosophy; ii) Economics; iii) Psychology; iv) Law; v) Politics; and vi) Public Administration. The findings and the conclusion of this paper involve promoting cultural and behavioral transformation of public servers, so that they can develop soft skills, connected to reasonableness and meaning, to emotional and intuitive intelligences, not only hard skills (technical, scientific and bureaucratic training). The recommendations are in the sense of promoting managerial and educational training for public servants in this connection. Hopefully these transdisciplinary concepts and applications may be useful for many countries.

Key words: Public Administration

Introduction

Transdisciplinarity can be understood basically as the dialogue of opposite poles, as the interaction and the integration of opposites (dualities), considering dialectics between specialists and generalists, between the analytical and synthetic method.

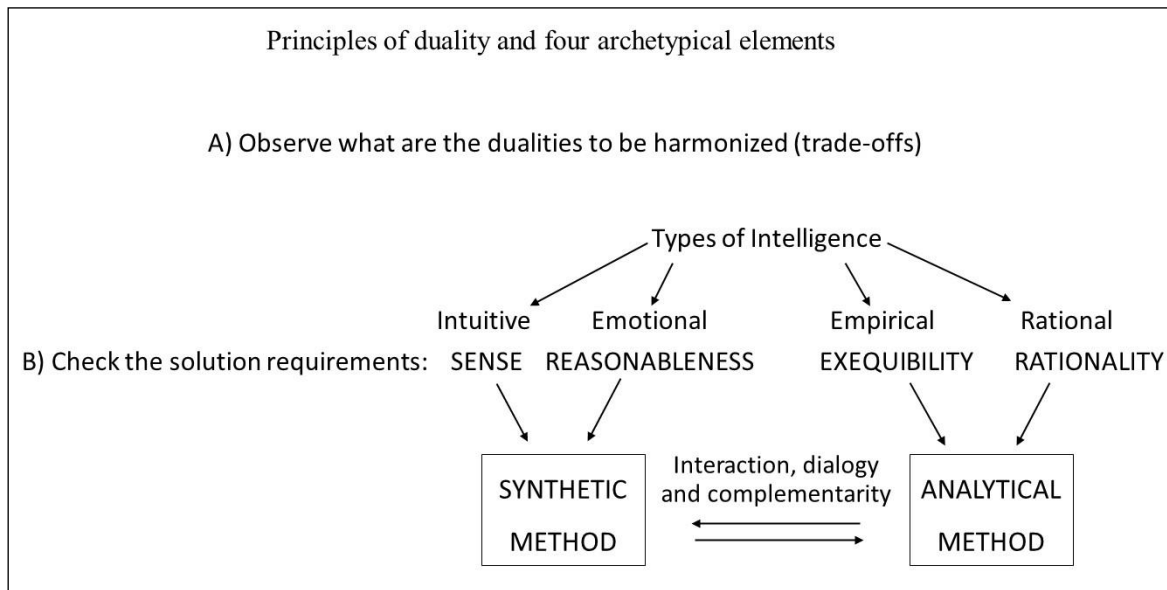
¹This paper is the sole responsibility of its author, not necessarily reflecting the view of any public institution, such as the Brazilian National Treasury".

The main objective of this study is to evidence transdisciplinary as a tool for problem solving, as applied knowledge and understanding of reality, more than the mere intellectual view. The main transdisciplinary vision comes from modern physics: duality. In physics, at the beginning of the 20th century, particle-wave duality was discovered. Everything has a particle character (something concentrated) and wave character (something expanded). Even the light, which in the mechanistic classical paradigm would be only a wave, but light is diverted by gravitational fields due to its particle character (its mass). One character predominates over the other. In light the wave character is dominant. This means that in non-mechanical phenomena and not predictable by Newtonian physics (classical physics), the Cartesian paradigm or the Aristotelian logic. That is, in human phenomena, this dual character is intrinsic, already observed in modern physics regarding non-mechanical phenomena. In this context, subject and object are interacted, cannot be separated, which means the observer interferes in the experiment.

In praxis, the scientific “*exemption*” does not exist, and belongs to rationalists, reductionists and scientificists. It has been an anachronistic paradigm since the beginning of the twentieth century, with the advent of modern physics and Jungian psychology. The holistic view of reality, including holology (the study of the whole) and holopraxis (the praxis of the whole) is basic for transdisciplinarity. In this connection, anthropologist and psychologist Roberto Crema, rector of UNIPAZ in Brazil, teaches that Jungian functions of feeling and intuition make up the synthetic method, while those of sensation and thinking underlie the analytical method. The scholar considers that we can summarize the synthetic method as a necessary and creative response to the fragmentation crisis based, paradigmatically, in a science detached from consciousness, which led the subject to degenerate into an object. This method is the basis of the generalist. It is a qualitative pathway that is opposed to the quantitative and merely objective approach of the specialist. So, the author sees transdisciplinarity as the dialogue between the synthetic and the analytical methods, considering the Jungian theory of four psychological functions (CREMA, 2017:166-168).

Based on the four Jungian functions (intuition, feeling, sensation and thinking), this author Model 1 considers respectively the four types of intelligence, as an easier way to understand Jungian functions: intuitive, emotional, empirical (meaning “sensitive” in Jungian terms) and rational. To illustrate the need for dialogue between the analytical and synthetic methods, the Model 1 scheme was constructed for reflection on how to deal with solutions to managerial problems, when they involve human phenomena, in terms of dualities or polarities and four elements: sense, reasonableness, feasibility and rationality. Model 1 is a result of our conception and developed based on i) Jung’s psychological typology explained by Franz (1971) and ii) the Myers–Briggs Type Indicator (MBTI) system of self-leadership and management – MBTI, which improved the Jungian classification.

The four requirements can be correlated to the psychological functions developed by Jung in his psychological types, which is the basis of the MBTI system: dominance of intuition, feeling, sensation or thinking (DOM CABRAL, 2017).

Model 1. Duality and four elements as troubleshooting requirements

Source: adapted from author's own research (COSTA, 2021:99).

Besides, Model 1 shows our vision of transdisciplinarity, which can be as simple as the A) dialogue of opposites, interaction of dualities or dialectics and B) the integration and balance of the four archetypical elements or principles, respectively:

B1) In **ancient traditions** – earth, water, air, and fire (the alchemical four elements).

B2) In **physics** – solid, liquid, gas and plasma (the states of matter).

B3) In **psychology** – sensation, feeling, thinking and intuition (the conscience functions).

This idea of four elements in three approaches (B1, B2 and B3) can be corroborated by Jungian psychology (Franz and Jung himself), considering the correlation of psyche and matter or psychosomatics.

According to Franz (1980), the alchemist Zosimos stated in the 3rd century that the four elements should not be understood in a concrete way; on the contrary, they would be mysterious "*centers*" or principles present in the matter. Later, they were interpreted as aggregations: all solid matter was considered as "*earth*", all liquids as "*water*", all gases as "*air*" and everything that burned, corroded or burned as "fire".

As far as psychosomatics is concerned, one can also think of the physical and the psychological as a duality and as a whole. In an interview with psychologist Dr. Richard Evans, Jung (1957) made a parallel between the matter of our physical body with the psyche, the latter as a quality of matter, another aspect of matter. Considering that psychology was separated from philosophy as a discipline only in the end of 19th century; even in Plato's philosophy these four elements are present, and can be shown in the same sequence of BI to B3 approaches in the divided line A, B, C and D (University of Florida, 1999), a content of Plato's *The Republic* (2013):

A- *Eikasia* – sensible appearances (perceiving).

B- *Pistis* – common sense (belief).

C- *Dianoia* – thinking (like in math).

D- *Noesis* – intelligence or intuition (dialectics).

² Archetypes are universal images or patterns, culture-independent models or scripts. The initial concept comes from Plato, but Jung explored the idea in his theory of the collective unconscious.

The connection with Jungian functions sounds clear:

A- sensation, B- feeling, C thinking and D- intuition.

So, those four elements tend to be shown in archetypical form, that is how came the idea of requirements of feasibility, reasonableness, rationality and meaning, as an insight, it is a conjunction of physics, psychology, philosophy and management.

Finally, this paper aims at showing concepts and examples of applied transdisciplinarity, starting from different disciplines and various papers, together with more contents in the comments and in examples for each item:

Item	Discipline	Author	Main Country
1.	Physics and Philosophy	Nicolescu	Romania
2.	Economy	Max-Neef	Chile
3.	Psychology	Crema	Brazil
4.	Law	Wiviurka	Brazil
5.	Politics:	Viparelli	Italy
6A	Public Administration	Uwizeyimana	South Africa
6B	Public Administration	Nita	Romania.

Source: Table created by the author

1. Physics and Philosophy

Romania: **Basarab Nicolescu**³, co-founder of CIRET⁴

Nicolescu (2010) makes a history of the origin of the term transdisciplinarity and its future perspectives, multidisciplinary is related to the study of several disciplines at the same time, but without interaction between them; interdisciplinarity transfers methods from one discipline to another, with the possibility of creating new disciplines; finally, transdisciplinarity goes beyond all discipline: its objective is understanding, for which one of the imperatives is the unity of knowledge. There is no opposition between disciplinarity – including multidisciplinary and interdisciplinarity – and transdisciplinarity, but a fertile complementarity. There’s no such thing as one without the other. Mechanical phenomena do not have the contradictions of human phenomena, which have the same nature as those unveiled by modern physics.

Comments: this is a direct application of the principle of particle-wave duality of modern physics, in which it is not possible to apply classical physics – mechanical phenomena. Also worth mentioning Nicolescu’s theoretical basis coming from modern physics, understood, in our point of view, as follows.

³PhD in physics (Pierre and Marie Curie University of Paris). Honorary theoretical physicist of the National Center for Scientific Research, of the Laboratory of Nuclear Physics and High Energy of the same University. Founding president of the Centre International de Recherches et Études Transdisciplinaires (CIRET) in 1987, together with Ubiratan D’ Ambrosio (Brazilian mathematician) and Edgar Morin (French anthropologist). Since then, Nicolescu is the great mentor of the international transdisciplinary movement, which postulates a new alliance of science with consciousness.

The International Center for Transdisciplinary Research (CIRET) is a non-profit organization, located in Paris and founded in 1987. The aim of the organization is to develop research in a new scientific and cultural approach - the transdisciplinarity - whose intention is to lay bare the nature and characteristics of the flow of information circulating between the various branches of knowledge. The CIRET is a privileged meeting-place for specialists from the different sciences and for those from other domains of activity, especially educators. Site access (in English): <https://inters.org/websites/CIRET>.

- A. **Classical physics:** since Newton in the 17th century. XVII, Two key principles: i) **separability**, ii) **action and reaction**. Newtonian philosophy is still dominant in economics and human sciences. Some exceptions: Max-Neef (Economics) and Jung (Analytical Psychology).
- A. **Modern physics:** quantum (Planck, Bohr, Heisenberg, De Broglie and others) and relativistic (Einstein). The main transdisciplinary idea comes from modern physics: **duality and complementarity**.

Few realize that physics is the mother of all natural sciences and humanities. As a rule, the paradigms developed in physics take time to be applied in other disciplines. One of the rare exceptions is Jungian psychology, contemporary of modern physics at the beginning of the 20th century, because Jung discovered principles analogous to particle-wave duality, subject-object and conscious-unconscious, considering ancient philosophies and traditions, which Freud did not study, hence the division between Jungian “*analytical psychology*” and Freudian “*psychoanalysis*”. However, Jung was a scientist – a psychiatrist and a hospital director, who also maintained understanding with modern physicists.

In our opinion images can sometimes represent synthetically more than many extensive texts. A single image can provoke revealing insights that synthesize years of study, complementary to the analytical technoscience paradigm. Transdisciplinarity promotes a dialogue between the analytical or diabolical method (separation) and the synthetic or symbolic method (joining). Diabolos in Greek means “to launch separately” and symbolo “to launch together”, in a synthesis of concepts, which brings together rationality and significance or meaning.

Example: for Costa (2021) in public management there is a tendency for the subject to be degenerated in object, that means excess of diabolos, of analysis. Analysis and technoscience are connected to rationality and feasibility, but must have dialogue with symbolo or synthesis, connected to meaning, sense and reasonableness, otherwise the human phenomena is disregarded, there will be less effectiveness if solutions consider the mechanical part of the phenomena only. In Brazil, managers tend to be focused only on controls and accountability, because the mechanistic paradigm does not consider the human factor, such as incentives for proactivity. Instead, the focus is on processes and not on results. This has negative effects on the quality of public expenditure.

2. Economics

Chile: **Manfred Max-Neef**⁵,

Max-Neef (2014) recalls his academic career, considering he spent a lot of time diagnosing and analyzing (an analytical hypertrophy), but was not used to understanding. In addition, The scholar also recalls his 1996 meeting with the American physics doctor Philip Smith, resulting in the same book *La economía desenmascarada*, in which he criticizes the dominant scientificism in economics:

[...] I began my academic career at age 27, as a professor at Berkeley during the early 1960s. [...] My entire discourse as a mainstream economic scholar was completely

⁵Former professor at the University of California – Berkeley, winner of an alternative Nobel Prize in economics, former rector of the Southern University of Chile, candidate for president of Chile in 1993 with 6% of the vote, died in 2019.

inadequate for me to say anything meaningful. I was used to diagnosing and analyzing, but not used to understanding.

[...]

It was simply a matter of Jungian synchronicity that the paths of the physicist and the economist eventually converged. [...] the idea that we could write a book together appeared, with the intention of demonstrating what economics was like behind its mask of supposed exact science, mathematical and free of value judgments.

Free translation from Spanish to English. (MAX-NEEF, 2014:13-14).

In the paper Foundations of transdisciplinarity, Max-Neef (2005) asserts that if asked to define our times, he would say that we have reached the point in our evolution as human beings where we know a lot, but we understand very little. While in the field of knowledge it makes sense that I (subject) represent a problem and look for its solution (object), in the domain of understanding there are no problems, but only transformations that integrate subject and object. It can be concluded, therefore, that knowing and understanding belong to different levels of reality.

Comments: after all, in our opinion understanding involves something broader than knowing, that means the integration between analytical and synthetic methods, between rational-sensitive and emotional-intuitive intelligences, hard skills and soft skills. Max-Neef points out the analytical excess that creates problems in economic theories. In this connection, economists tend to be confused between efficiency and effectiveness. Similarly, some lawyers in the public sector cannot perceive, in practice, the difference between rationality and reasonableness, given the same analytical hypertrophy. In a 2021 lecture, the Brazilian Minister of Economy (ME) said: since 2019, when he took over, he had never seen so many competent servants, doing in a very precise way the wrong thing. The central thesis of this paper involves the same distortion in public management. The ME is supposed to be a liberal orthodox, and Max-Neef can receive labels of being an outsider, an environmentalist, because he once was professor at Berkeley, UCLA, known for his heterodox ideas. After all, labels and ideologies lose their meaning when it comes to broader and essential transdisciplinary tools. In its manifestation, the ME referred, perhaps even unconsciously, to one of the concepts of the private sector in Brazil of efficiency (doing right) and effectiveness (doing the right thing). In the traditional Cartesian economic view, the tendency is to put everything as "efficiency", without distinction. In the public sector efficiency involves conformity of a process and economics. On the other hand, efficacy is connected to concrete results. After all, management involves something more than technicalities. A good manager needs to be a generalist who is always open to discussion and to listen, so as not to get lost in technobureaucracy. It is necessary to learn how to dialogue with all the actors involved in each process.

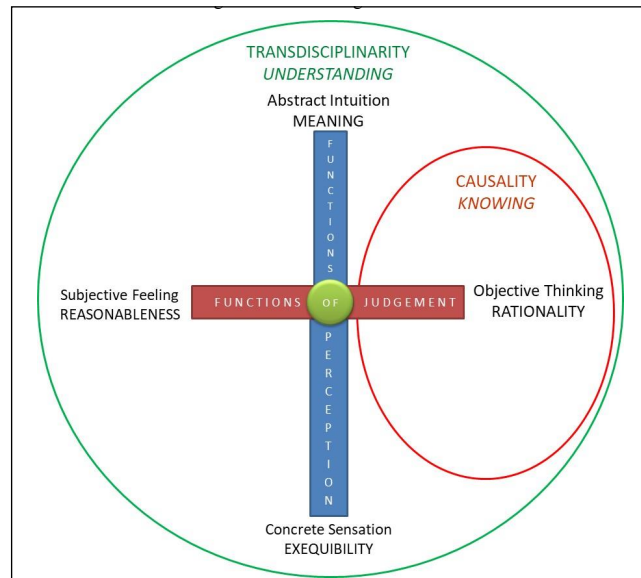
In psychological terms, according to Crema (2010) there is a hypertrophy of information and knowledge, of broad, unrestricted and immediate access, but also an atrophy of the process of discernment and understanding.

Those economical and psychological visions are mapped in Model 2, based on Model 1, Model 2 was developed to show, in terms of duality and four elements connected to transdisciplinarity, the difference between knowledge and understanding.

Also, in Model 2 the idea of causality is shown in connection to knowing, in the sense that cause and effect are typical of the rational point of view, which Jung (1973) considered the Western way, while synchronicity would be the Oriental way of seeing reality.

One could consider transdisciplinarity as an integration of causality, where linear logic reigns, and synchronicity, where the meaning comes first. In Model 2 “*meaning*” is shown connected to intuition.

Model 2. Knowing and understanding – dualities and four elements



Source: adapted from author's book (COSTA, 2020:212).

Example: public policy models may be rational, but not reasonable, or even feasible, in the sense that they could bring an intolerable burden to society, for instance. Moreover, there must be a dialogue between reductionist quantitative econometric models (objectivity) and the psychology of agent expectations (subjectivity). That is what knowledge and understanding is about. As a simple corporate management example, which entrepreneurs know very well. In decision making processes involving investments, even if there is a technical eco-fin feasibility study showing excellent internal rate of return, if the entrepreneur feels an intangible risk, difficult to be measured, or even if he sees lack of sense or meaning in the solution, he will not invest. This is a typical case where there are 1) soft skills: meaning and reasonableness at **Model 2** (intangible sense of risk) in dialogue with 2) hard skills: rationality and exequibility or feasibility (technical study).

3. Psychology

Brazil: **Roberto Crema**⁶, rector of UNIPAZ and co-founder of this institution.

For Crema (2010), there is a hypertrophy of information and knowledge of broad, unrestricted and immediate access, while simultaneously there is an atrophy of the process of discernment and understanding. As Heidegger well denounces, we have never been more alienated from the human issue. We need, therefore, to reflect on what prevents us from updating our references and what can open us to the possible universe of an intrapersonal and interpersonal understanding, subjective and intersubjective,

within the framework of a Trinitarian ecology: individual, social and planetary. Among the obstacles outside intellectual understanding, Edgar Morin points to the existence of "noise", the lack of understanding caused by the polysemy of concepts, ignorance of the rites, habits, values and ethical imperatives of others, the incompatibility of worldview and the inequality of mental structures. As for internal difficulties, Morin indicates egocentrism, ethnocentrism and sociocentrism. Perhaps we can broaden these lucid considerations by affirming the existence of a mega-factor that impedes understanding, which consists of what Pierre Weil, Jean-Yves Leloup and Roberto Crema called normosis, a pathology of normality.

Comments: understanding is closely related to the psychological concept of consciousness. For Jung (1989), consciousness begins its evolution from an animal state that seems unconscious to us, and the same process of differentiation is repeated in each child, as happens physically in the anatomical evolution of species, so it is also in the psychic system. In this complex process, the ego arises. He also teaches us that we are aware only of a small part of the world. Our vision reaches only a certain distance, our memory is insufficient, our sensory perceptions, important to our orientation, too. A lot of things happen that we're too blind to see.

Example: as far as Crema and Jung are concerned, we can consider dualities of knowledge-understanding, subject-object and conscious-unconscious. In practice, there is no supposed "impartiality", nor a single objective truth, when it comes to human phenomena, especially in public management. Considering the idea of normosis, there is a tendency to see things from the "knowledge" perspective only, not from the "understanding" one. That is a cultural problem to be addressed. Understanding means seeing things not only by rationalism and feasibility, but also by reasonableness and sense, something essential in the point of view of problems solving in public management.

4. Law

Brazil: Eduardo Seino Wiviurka⁸.

Wiviurka (2010) analyzes the possibility of applying the epistemological practice of transdisciplinarity to the science of law. For this purpose, at first he presents some characteristics of transdisciplinary thinking, highlighting the complexity and form of development of transdisciplinary research (in comparison with disciplinary, interdisciplinary and multidisciplinary research), which can be approached more easily from the law. Thomas Kuhn's thinking about the evolution of science is presented, emphasizing scientific revolutions, a process by which one paradigm succeeds another model in which the idea of "transdisciplinarization" of law is inspired by the author. He also analyzes Brazilian CNE/CES Resolution and identifies legal positivism as a paradigm for the science of Law. Also the author presents some of its limitations in the face of transdisciplinarity and the evolution of social phenomena (characterizing its crisis), a context in which the challenge of "transdisciplinarizing" the Law is proposed.

⁸Anthropologist and psychologist, master in human and social sciences from the University of Paris, creator of the Fifth Force in Therapy (Transactional Synthesis), former coordinator of the International College of Therapists (CIT) in Brazil.

⁷The Governor of the Federal District in Brazil, José Aparecido, in 1987 assigned the public property Granja do Ipê for this purpose, an area very close to the Brazilian capital Brasília. UNIPAZ It is a non-governmental, non-profit organization, declared a Federal Public Utility agency. It was created to develop specific and inter-related projects related to the holistic view and the transdisciplinary approach. Site access (in Portuguese): <https://unipaz.org.br/>.

Comments: in this connection, there is the question of media culture, the rationalist bureaucratic paradigm in which the means become an end, in a self-reference such as in some public institutions in Brazil. The transdisciplinaryization of the law could help in the awareness of all actors directly or indirectly involved in public management.

For Costa (2021), the public managers in Brazil tend to be inert in the face of the legal uncertainty of statutory law (excess of written legislation). Their actions tend to be based on the preview of possible formal accountability and the production of detailed documentation to face them, thus leaving the focus of his management in a second plan. It is a bottleneck in the quality of public spending in effective terms, which also involves, in the case of Brazil, a tendency for a salvationist and heroic culture of controllers. In practice the opposite can happen if the systemic effects are not considered before actions. There are several disciplines involved, not just in the formalism of law or legislation

Example: considering Costa (2020), the mere literal interpretation does not reflect the spirit of the law, the intention of the legislator at the end. In Brazil, the excess of written legislation is often not sufficient for the solution of concrete cases, demanding a more sophisticated interpretation. So, it seems to be necessary analogies with other laws, general principles of law, or even uses and customs. Reductionist literalness tends to prevail today in various instances of controllers of public management in Brazil. There is no stimulation for the systemic view of the core business of institutions. As a result, managers tend to be reactive, not proactive, because they are focused on controls and on accountability. Finally, this is a matter of cost and benefit analysis, involving dialectics between control and management discretion, a trade-off to be faced.

5. Politics

Italy – Irene Viparelli¹⁰,

As far as scientific knowledge is concerned, the transdisciplinary attitude represents a complementary element that, although necessary, is external to disciplinary knowledge, in the case of the human sciences, quite the contrary, transdisciplinarity is a structural, immanent, essential element. In fact, we have, on the one hand, the relationship of the human sciences to disciplinary and technical knowledge, which reduces man to an object, actively collaborating in fragmentation and incommunicability between knowledge. On the other hand, and therefore, the human sciences have to recognize their transdisciplinary core, never forgetting the question surrounding the encounter between subjectivity and objectivity. [...]

We can then, in the form of preliminary conclusions, affirm that a transdisciplinary approach to politics implies the recognition of its humanistic core, making it impossible to reduce it. [...]

In sum, given the essentially expansive logic of instrumental rationality, politics cannot build only one “*beyond form*”, as Habermas intends, nor, following Nicolescu, a simple region of practical realization of the transdisciplinary view of the world. [...]

The included Third Party, finally losing its indetermination, should be recognized as a “*transdisciplinary policy*”, that is, as a critical process of restoring the autonomy of politics, as a legal process for defining

¹⁰Professor of law theory and constitutional law, master in law and PhD in philosophy in UFPR, Brazil.

⁹BRAZIL. National Board of Education. Chamber of Higher Education. Resolution No. 9 of 29 September 2004 Available in Portuguese at: <http://portal.mec.gov.br/cne/arquivos/pdf/ces092004direito.pdf>.

normative principles by subordination of systemic logic to the project of a “*human*” society, based on the transdisciplinary principles of Rigueur, ouverture et tolérance (Nicolescu, Morin and Freitas, 1994). It will be concluded then that transdisciplinarity allows us to rediscover a critical function of politics, removing its possible reduction to technical knowledge and imposing the centrality of the question around the meaning.

Free translation from Portuguese to English. (VIPARELLI, 2019:54-57).

Comments: the excerpts from author’s paper (including her concept of “*transpolitics*”) is a corroboration of our opinion:

- a) subjectivity and objectivity are inseparable;
- b) recognition of the humanistic core of politics, to overcome reductionism and analytical hypertrophy of the human sciences in general;
- c) rationalism is insufficient;
- d) Nicolescu Third Included is a critical process, to remove reductionism and to centralize the issue around the meaning. This reminds our ideas of dialogue between: i) synthetics of meaning and reasonableness; and ii) analytical feasibility and rationality.

Brazilian Professor Baesso (2021) corroborates this view, in sociological terms. The author gives the example of five people who describe a traffic accident. There will be five versions, according to the perspective of each one, hence the dialectics and the discussion to reach the common good of Aristotle in search of the agreement of different world views. In this connection, technical civil servants influence important policy decisions. The politicians are always between technical rationality and public opinion. Finally, the professor asserts that technicians will never have the neutrality that Max Weber and others imagined about rational bureaucracy.

Public servants should use their convincing power with their superiors. There’s nothing wrong with that, on the contrary. Such issues are essential in terms of the relationship between the internal and external actors of organizations, the dialectics between technical and the political aspect. It is wrong to think of politics as incompatible with the conduct and the compliance of a public servant. The same with psychology, when considered as mere treatment of emotional or mental disorders, not an instrument for cultural transformation. After all, psychology and politics involve the conscious development that provides relevant instruments to improve the quality of public spending. It is not advisable for the public servant to be naive or omissive in psychological or political terms, if the intention is to be effective in public management.

Example: in Brazil we have good examples of articulation of public servants with their superiors. The extinction of the PIS-PASEP Fund in May/2020 was the idea of a career server of the Ministry of Economy, who developed all the articulation and the process of convincing with his superiors, for the incorporation of the PIS-PASEP Fund by the FGTS Fund. The two are private funds of compulsory savings, under the tutelage of the public administration, whose coexistence did not make much sense in terms of public management, in view of the similarities between them. By joining PIS-PASEP, a smaller

fund with assets of around USD 4 billion, to FGTS, a fund with assets of around USD 100 billion, the idea of simplification and efficiency of management was simultaneously honored. In addition, there is now only one managing bank who was already an administrator of the FGTS, while in the PIS-PASEP Fund there were two managing banks for the accounts and another one for applications of the resources. For Costa (2021), some may confuse psychology and politics in public management with ideology, but ideology is inside those who can't understand psychological and political interactions in internal and external processes to organizations, which have nothing to do with partisanship. Everything unknown or unconscious can be mystified by the inattentive. In this connection, there is an excessive technobureaucratic preparation (technical, scientific and bureaucratic) to allegedly provide the servant with instruments for dealing with the quality of expenditure. Therefore, it is necessary to promote the transformation of the culture and behaviors of technobureaucrat servers, to also develop the soft skills, which complement the technobureaucratic hard skills.

6A Public Administration

South Africa and Uganda: **Uwizeyimana and Basheka**¹¹

According to Uwizeyimana and Basheka (2017), the history of public administration can help to understand how disciplines related to public management were formed, starting with political duality and administration before the 20th century, through the scientific administration of Taylor and Fayol in the early twentieth century, until human issues in public administration began to be considered, when history becomes more complex, culminating with e governance and the 4th Industrial Revolution in 2017.

Comments: Four key disciplines can be evidenced from the consolidation of twelve disciplines as shown in Figure 1 of this South African paper, in order to facilitate the vision of the whole system of Public Administration (COSTA, 2021:80).

- i. **Technoscience**, starting from Economics – the interaction between technology and science. including Economics, Administration and other natural sciences.
- ii. **Bureaucracy** – Law and Legislation.
- iii. **Psychology**, including other humanities, which are not Technoscience, meaning that they are not “*exact*” or biological. Technical leadership is included in this context.
- iv. **Politics**, considering not only the traditional politics, but also the intuitive leadership.

The idea of reducing the twelve disciplines from the South African paper to only four groups came from the four epistemic groups of disciplines showed by Weil, D'Ambrosio and Crema (1993): **technoscience, philosophy, tradition and art.**

¹¹D E Uwizeyimana.(School of Public Management, Governance and Public Policy University of Johannesburg, South Africa); B C Basheka (Uganda Technology and Management University Kampala, Uganda).

¹²Ways of understanding reality through the four basic disciplines. Considering also de MBTI system and Jung's psychology, the following scheme can be designed:

<i>Discipline</i>	<i>MBTI features</i>	<i>Jung's Functions</i>
Technoscience	concrete + objective;	sensation + thinking;
Philosophy	objective + abstract;	thinking + intuition;
Tradition	abstract + subjective;	intuition + feeling;
Art	subjective + concrete;	feeling + sensation;

So, our resulting model takes into account Weil's transdisciplinary four disciplines or epistemic forms, together with the scientific principles in the South African paper, considering:

- a) Economics is the dominant discipline in public management as a technoscience involved with the discipline of general Administration.
- b) Psychology is vital for understanding interactions between the internal and external environments of organizations, actors involved in the processes and the relationship of public servers at the individual and at the collective level.
- c) Law is essential for the understanding of Bureaucracy, which often becomes self-centered and dysfunctional, when the ends become the means.
- d) Politics involves dialogue and articulation between various actors with different ideas for solutions, whether in the internal or external environment of organizations. It applies here in a sense that goes beyond mere technicality of political science, not be confused with partisan ideology.

Example: this study expresses a dialog between theory and praxis in public management in Brazil. There are four interdisciplinaritys that can be identified in our approach (COSTA, 2021:83):

- A. Technoscience with Bureaucracy: this is the technobureaucracy, which risk is the gullibility of not considering Politics and Psychology;
- B. Technoscience with Psychology: this is the business management idea, which risk is not to observe the legislation of Bureaucracy and its limits to discretion;
- C. Psychology with Politics: this is the communication bias, which can result in manipulation if certain ethics milestones of compliance are not considered;
- D. Bureaucracy with Politics: this is the party ideology that can contaminate the public management if considered in a dogmatic way.

Those four interdisciplinaritys show the risk of each approach: A) gullibility, B) excessive discretion, C) manipulation and D) partisanship. In the end, transdisciplinarity applied do public management comes out as an alternative to balance all the limits of disciplinarity (Technoscience, Bureaucracy, Psychology and Politics) and interdisciplinaritys A, B, C and D. Concrete examples, in this case, are very delicate to be disclosed, as far as ethics is concerned.

6B Public Administration

Romania: **Mircea Aurel Nita**¹³.

Nita (2013) proposes a new type of education in Public Administration, which consists of learning to know, to do, to live and to be.

Comments: there can be analogies with the four intelligences from a Jungian perspective: rational, sensitive, emotional and intuitive, respectively. Here is a possible dialogue between the author's approach and our transdisciplinary vision based on Jungian psychology and the Myers-Briggs Type Indicator – MBTI system:

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- a. To know in the form of research, academia and intellect: objective rational intelligence.
- b. To do in the best possible way: concrete sensory intelligence.
- c. To live in society with self-control and relationship capacity appropriate to the norms and rules of coexistence: subjective emotional intelligence.
- d. To be in terms of self-knowledge, which the author understands as the idea of spirituality. However, it also involves, as a counterpart, learning to do in terms of innovation, because innovation is a characteristic derived from intuitive insights, from new ideas that come from the unconscious to the conscious, in the Jungian paradigm. In this sense spirituality can be related to the intuitive intelligence, which is abstract.

A point that could be added to the discussion: at the personal level (not collective or organizational) there is a fifth integrative element. In ancient traditions such as European alchemy it can be seen as the quintessence in terms of conscientious or beginning development, a process that Jung called in his psychological theory of “individuation”. Conscientious development is closely linked to cultural and behavioral transformations relevant to the management of public organizations or institutions. According to Crema, the integration of the four intelligences (Jungian functions) is manifested in a fifth Jungian function, the Self, an intelligence of psychic totality. (CREMA, 2017:166).

Example: a way to understand this Self principle is the integration of the four intelligences as duality of methods: analytical (rational + sensitive) and synthetic (emotional + intuitive). This duality represents the integration and interaction of opposites inside the psyche.

Conclusions

The transdisciplinary approach applied to public management is simple, based on the principles of 1) duality – interaction and integration of opposites, specially the analytical and synthetic methods and 2) four elements - rationality, feasibility, reasonableness and meaning. However, it is not a simplistic or a magical-vitalistic approach as it may seem to technobureaucrats and to rationalists at first, if modern physics is considered. The holistic view of reality, including holology (the study of the whole) and holopraxis (the praxis of the whole) can't be confused with political ideology, specially for technobureaucrats who consider themselves “*exempt*” and “*impartial*”. On the contrary, transdisciplinarity only incorporates Politics, as well as Psychology, relevant disciplines to be treated in the internal and external environment of public organizations, as much important as Technoscience (technology and science) and Bureaucracy (law and legislation). Currently there is an analytical hypertrophy between managers and controllers in Brazil, which can be verified by the dominantly scientific profiles, technicians, bureaucrats or technobureaucrats, who tend to disregard or to ignore the human and political aspects involving public management (the human phenomena). However, the business managers from the private sector who try to be public managers are also unbalanced, because they tend to not take into account the peculiarities of public management, such as the bureaucracy of doing only what law allows. In this aspect there are some concrete cases of entrepreneurs without the ability to listen to various public actors and understand the operating system as a whole. Therefore, the solution for public management involves dialogue, a dialectical process between generalist public managers and various specialists, so that culture and behaviors can be transformed. For sure this is the case in Brazil, where hard skills (technical, scientific and bureaucratic) are insufficient to provide instruments for dealing with management in a broad sense in terms of effectiveness.

Finally, the core idea is to promote transformation of the culture and behavior in public servants, so that they can develop soft skills, connected to reasonableness and meaning, emotional and intuitive intelligences, something relevant in Brazilian public management nowadays. Hopefully these transdisciplinary concepts and applications may be useful also for other countries.

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