A Topological Theory of the Tensional Psychological Determinism

Alin Gilbert Sumedrea

***Abstract*—**Tensional psychological construct is connected to the major desideratum of the human species, namely perpetuation and progress. The psychological dynamics of each and every person is governed by two realities, i.e. optimism and acceptance. This paper proves the existence of a rigid determinism which dictates the tensional psychological dynamics, cancelling free will. The tensional psychological dynamics is also connected every moment to the major desideratum mentioned above. The conscious instance, through its functionality, provides the optimism whereas the unconscious one provides the acceptance. The unconscious instance functions as a receptor, receiving the information from the personalized sense of the person. At the same time and because of this sense, the unconscious instance functions already as a selector of tensional strategies. To describe and prove these aspects, our approach uses the theory of homology.

***Keywords*—**diffuse psychological tension, Euler characteristic, homology, psychological determinism, topological space.

I. An Argument for Determinism

TENSIONAL psychological dynamics submits to a rigid determinism, meant to preserve a parametric law of the species.

From a certain point of view, the living species of the universe, including the human race, look the same. In fact, the lack of discernible criteria of the species has the role to increase the control and the efficiency of the evolutionary process to the extent that these are established. A possible modification could be interpreted as a failure of nature which would be unconceivable, even for its administrator.

The source of the invincibility of each species dynamics should be looked for at the level of a kind of heuristics, realized by a cynical administration that would translate diversity into a parametrical multiple of two values, namely perpetuation and progress.

This perspective transforms the time parameter, as the parameter of any chronology, into a temporal field.

It is interesting but also explainable that the aspects mentioned above are accessible to the administrator while for spectators only the past event consciousness is characteristic.

Nevertheless, the administrator and the spectators feign to survey the same scene! If the spectator has the privileged position to live the scene with the interest determined by the possible projections of future scenes, the administrator seems to be in the situation to suffer, through lack of motivation, the boredom due to the current scenes superposition over the previous ones. In fact, the administrator is not at all interested in the succession of the scenes that show a visible progress of the species, but in the way in which the spectators interpret the scenes conceived for them! The most suggestive explanation to support such a reality could be that, in its essence, the real creation of the administrator seems to be the spectator’s consciousness.

The dramatic aspect of such a scenario is that, whatever the interpretation of the scenes, these do not change! But this happens every day if we think that the human being is born and dies without the capacity to share with the others the experience of these two essential moments of life, concentrating essential information about existence.

A. Tensional Psychological Determinism?

The psychological construct, apparently extremely complex, has two essential components, materialized in an undetermined component, represented by the psychological tonus (psychological energy) and a mixed construct, comprising an area of potentiality and another one, material, of physiological nature. The mixed construct has the role to modulate the psychological tonus in a purely individualized manner. The adequacy is subdued to the satisfaction of an external sense of personality transformation, taking into account the experience of life transcendence.

The architecture of the psychological construct of the kind that has already been described above is justified by the existence of a unique consciousness responsible for the supply with essential liquid represented by the psychological energy. Thus, the reason for the existence of physiological construct is determined by the presence of a unique consciousness, capable to identify and value it through the supplied psychological energy.

But what is the reason for generating of psychological tonus? The existence at the end of the explanatory chain of a super – consciousness without consciousness might appear bizarre, at least at the intuitive level.

The potentiality area holds patterns of manifestation of the tensional dynamics. The patterns describe models of unaltered dynamics of tensional states. In this register, the tensional state

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is switched off from the filter of analysis correlated with other tensional states.

Two questions need to be asked referring to the tensional states. Why are there tensional states? Do the tensional (potential) psychological states have a consciousness?

The existence of the tensional states has to justify the contribution of the person to the progress of the species. They have to be in agreement with the personalized scenario of life. However, tensional states are identical as components of the psychological construct. What renders them specific is their succession within the chronology of a life scenario.

The tensional psychological register contains a basis of tensional states determined by the compulsivity that marks the existence of each person but also a multitude of tensional states configured under the form of certain combinations of elements of the aforementioned base. Both the base of tensional states as well as the combinations of elements of the base are operational from the beginning of the intrauterine life and constitute the supported manifestation of the earlier mentioned compulsivity.

Two elements are essential in this construction; the source of the psychological energy and the manner in which this energy is consumed.

II. THE SOURCE OF THE PSYCHOLOGICAL ENERGY

The psychological system is an autonomous one, capable of generating and consuming its energy. In agreement with Gustav Jung's psychoanalytical theory, the presence of the psychological energy is marked by the effect of the collision of contraries.

The equilibrium condition of any system [5]–[8]–[9] including the psychological one requires the conversion of the energy into a tensional state capable of justifying its consumption (of energy).

This one (the tensional state) has two components functioning as a system, respectively: need and saturation. Both have tensional valences. We could define need as an unconscious desire to experiment a new tensional state and saturation as the mirror image of need.

The representation of the effective tensional states has to be able to carry the exigency of contractible spaces. In this sense we admit as a representation of potential tensional states, the circle S^1 and for effective tensional states, the disk D^1.

The energy generated by the psychological system is constant and as a consequence it is necessary to convert permanently this energy into a tensional state as indicated above.

III. A MATHEMATICAL VISION OF THE TENSIONAL PSYCHOLOGICAL CONSTRUCT

It is reasonable to admit the fact that the tensional states develop in certain patterns of representations. To represent these patterns we use the boundary operator applied to the disk D^1.

$$D^1 \xrightarrow{\partial} S^1 \xrightarrow{\partial} 0 \tag{1}$$

We associate need with a tensional state. Thus, it becomes possible to approach the tensional states in terms of Maslow's theory.

Amazingly, at the psychological level, things seem to be in contradiction with the reality of the physical world, where bodies of high density attract the flow of matter positioned in a certain area of proximity. The process of increasing the density of a material body appears as an effect of its implosion. At the psychological level, we deal with the flow of attention. The attraction of the flow of attention manifests as a result of the explosion of a tensional state. Thus, two opposite processes generate the same effect (the attraction of matter / of attention). The only way to solve this contradiction, at least at the conceptual level, is to admit the idea of the existence of certain germination processes of the tensional states [10]–[11].

The derived (germinated) tensional states – as smaller copies of the original tensional state – could be obtained by gluing two opposite points of a disk, which are placed on its boundary, on the origin of this disk.

In the following, a simplified version of these processes is presented, using Maslow's representation with two tensions; physiological (F) and superior (S). The superior tension (S) is defined as a tension produced by a cause which is not of a physiological nature.

The psychological energy is initially converted into a diffuse psychological tension. This tension consists of two components, need and saturation, which are represented, in a homeomorphic manner (the homeomorphic representation of a circle is given by a triangle), as geometrical figures.

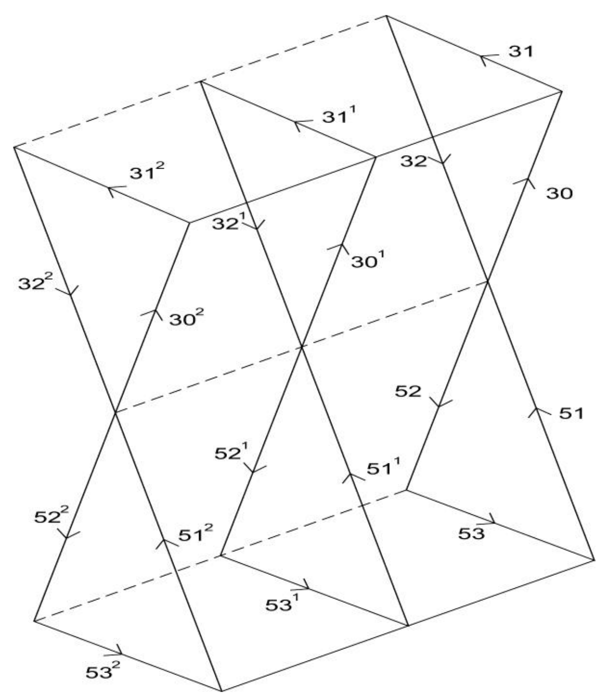

Fig. 1 The homeomorphic representation of the diffuse psychological tension

$$\partial_2\left(need\right)=\left\langle \begin{array}{l} 30+31+32, \\ 30^1+31^1+32^1, \\ 30^2+31^2+32^2, \\ \text{and so on} \end{array} \right\rangle$$

$$\partial_2\left(saturation\right)=\left\langle \begin{array}{l} 51+52+53, \\ 51^1+52^1+53^1, \\ 51^2+52^2+53^2, \\ \text{and so on} \end{array} \right\rangle$$

The components of the diffuse tensional state appear in a similar way as derived tensional states.

The diffuse psychological tension is immediately converted into an oriented psychological one. Thus, the manifestation of the physiological needs becomes possible and so does the manifestation of the superior ones. Each component of the oriented psychological tension (see the components of the levels 1 and 2 mentioned in the table I) has, like the diffuse psychological one, the same subcomponents, respectively need and saturation.

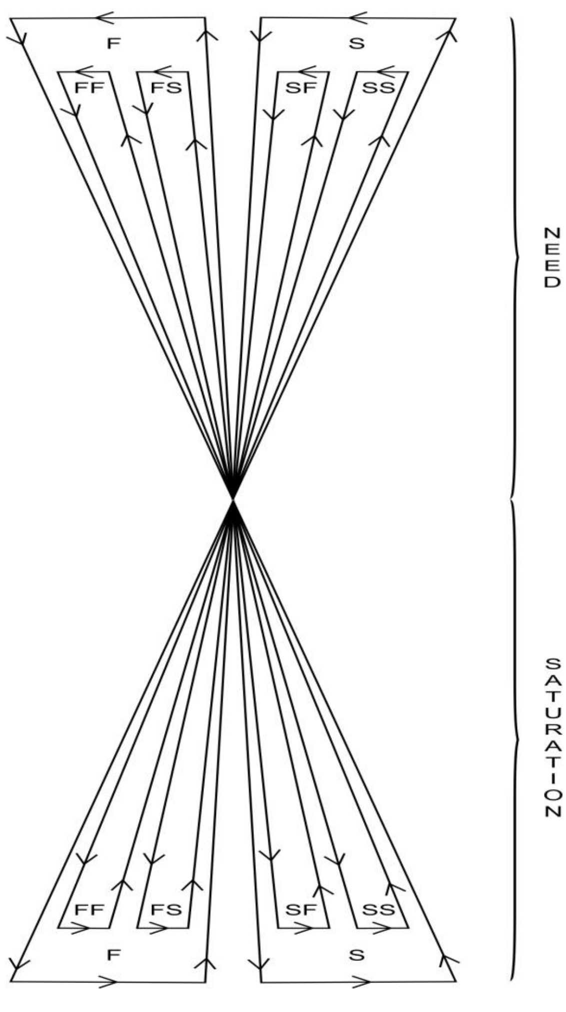

Fig. 2 The homeomorphic representation of the oriented psychological tension

The last sequence of life describes the situation in which the diffuse psychological tension and the oriented psychological one are placed in the same plane.

A. Coupling of the tensional states

The psychological system is endowed with a capacity which has to modulate the psychological tensions specific to the person. This one (the capacity) contains a register of intensities with n levels. The intensity is increasing at the same time with the rank of the level. In the following we will consider a register with two levels (intensities) as indicated below.

TABLE I: A REGISTER OF INTENSITIES WITH TWO LEVELS

Level 1	*F*		*S*	
Level 2	*FF*	*FS*	*SF*	*SS*

For a register with two intensities there are two possibilities of coupling the diffuse psychological tension with the components of levels one and two, as follows:

$$DT = F + S \tag{2}$$

or

$$DT = FF + FS + SF + SS \tag{3}$$

where:

DT – the diffuse psychological tension;
FF – the physiological source of the physiological tension;
FS – the physiological source of the superior tension;
SF – the superior source (as a cause which is determined by a superior tension) of the physiological tension;
SS – the superior source of the superior tension.

Indeed, there is a measure which is present in all cases whether we analyze the potential tensional state or the effective tensional one, respectively the length of the circle. Regardless of how much a circle is deformed this measure preserves itself. Since the psychological tension must be endowed with the specific properties of an invariant to any transformation suggested above, the length of the circle will be used to measure its amplitude. Moreover, the amplitude is used as an association criterion in order to express (2) and (3). The measures which are implied in these relations are associated to their amplitudes. The amplitude of the diffuse tensional state is calibrated to one, taking into account that this is a constant, and the components of levels one and two are calibrated to 1/2, respectively 1/4.

How could we explain the existence of two tensional intensities? The unconscious instance administrates the whole psychological information (psychological tensions and tensional psychological intensities). Only a part of this information is transferred to the conscious instance, respectively the information which is convertible in terms of the agreeable and disagreeable. Passing from a detected tension (which is associated with a tensional intensity) to the cause of this one is followed by an amplifying of the tensional intensity. In every moment of life one of these two intensities mentioned above becomes active. The cause of this activation should be looked for in the personalized sense of each person namely in the contribution of each person to the progress of the human species.

Why is this tensional intensity important? The progress of each person depends on the communication with other persons. In the absence of this communication the progress is determined by the existence of a psychological state which is induced by a tensional intensity. This one (tensional intensity) creates, for each and every person, the potentiality of accessing of certain types of information capable of explaining the progress mentioned above.

Each component presented in the right side of (2) and (3) contains two subcomponents, respectively need and saturation. Each one (component) describes one of the following possible tensional states; potential tensional states or effective tensional states. On the whole, the components and their subcomponents could be interpreted as topological spaces.

To realize its function, the psychological system has to distinguish between these topological spaces. This problem supposes the association of the tensional psychological state, as a topological space, with a topological invariant.

In the following, the approach will use the theory of homology in order to calculate the Euler characteristic, as a topological invariant, for all possible tensional psychological states. The calculations refer to the oriented psychological tension.

B. *Mathematical notions used*

Let X be a topological space [1]–[2]–[3]–[6]–[7]–[12]. We define a chain complex as a sequence of abelian groups. These (the groups) are connected by homomorphisms as follows:

$$C_n \xrightarrow{\partial_n} C_{n-1} \xrightarrow{\partial_{n-1}} \dots \xrightarrow{\partial_1} C_0 \xrightarrow{\partial_0} 0 \qquad (4)$$

Each element of C_i is an integral combination of vertices, of edges and so on.

We associate the set $H_k(X)$, which is called the k-th homology group [4], to the topological space X. The groups $H_k(X)$, k=$\overline{1,\dots,n}$ can be computed using the formulae

$$H_k(X) = \frac{\ker\partial_k}{\operatorname{Im}\partial_{k+1}} \qquad (5)$$

where ker and Im denote kernel and image. Elements of $\ker\partial_n$ are called cycles and elements of $\operatorname{Im}\partial_{n+1}$ are called boundaries. Also, elements of H_k are cosets of $\operatorname{Im}\partial_{k+1}$. The relation $\partial_{n+1}\partial_n = 0$ implies the inclusion $\operatorname{Im}\partial_{n+1} \subset \ker\partial_n$.

There is an important relation between the Euler characteristic (χ), as a topological invariant which describes the shape of a topological space, and the dimensions of $H_k(X)$, as follows:

$$\chi = rank\ H_0(X) - rank\ H_1(X) + rank\ H_2(X) - \dots \qquad (6)$$

where $b_i = rank\ H_i(X)$, $i = \overline{1,2,\dots,n}$ define the Betti numbers.

C. *Mathematical results*

This paragraph starts from the hypothesis that the psychological system administrates the tensional dynamics through topological invariants. They are associated with topological spaces which describe the tensional intensities mentioned above. Each topological space has a unique Euler characteristic.

This paragraph will present the specific calculations of the Euler characteristic for all possible tensional psychological states which are particularized in the following cases:

Case 1

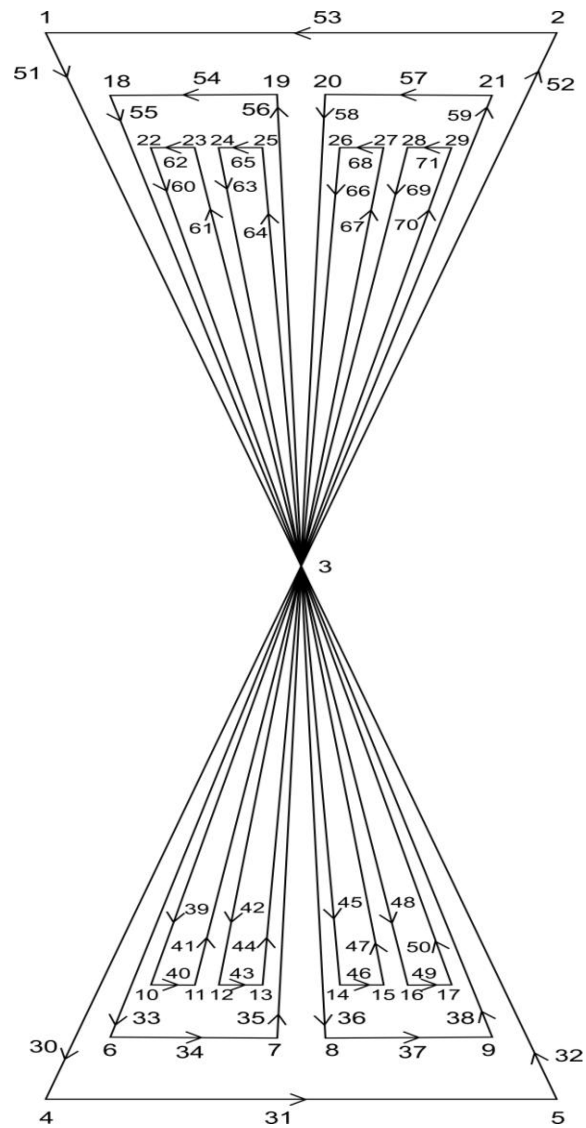

Fig. 3 The initial moment of the tensional psychological construct

Vertices: $\overline{1-29}$

Edges: $\overline{30-71}$

Faces: none

The chain complex for this case is:

$$0 \xrightarrow{\partial_2} C_1 \xrightarrow{\partial_1} C_0 \xrightarrow{\partial_0} 0 \tag{7}$$

$$\chi = rank\ \mathrm{H}_0(X) - rank\ \mathrm{H}_1(X) = -13 \tag{8}$$

Indeed

$$H_0(X) = \frac{\ker\partial_0}{\mathrm{Im}\,\partial_1} = = \frac{\langle 1,2,...,29\rangle}{\left\langle \begin{array}{l} 1-2,3-1,4-3,5-4,18-19,3-18, \\ 20-21,3-20,7-6,6-3,9-8,8-3, \\ 22-23,3-22,24-25,3-24,26-27, \\ 3-26,28-29,3-28,11-10,10-3, \\ 13-12,12-3,15-14,14-3,17-16,16-3 \end{array}\right\rangle} = Z \tag{9}$$

On the other hand

$$\begin{aligned}
&\partial_1\big(a_1 30 + a_2 31 + a_3 32 + a_4 33 + a_5 34 + a_6 35 + a_7 36 + \\
&+ a_8 37 + a_9 38 + a_{10} 39 + a_{11} 40 + a_{12} 41 + a_{13} 42 + \\
&+ a_{14} 43 + a_{15} 44 + a_{16} 45 + a_{17} 46 + a_{18} 47 + \\
&+ a_{19} 48 + a_{20} 49 + a_{21} 50 + a_{22} 51 + a_{23} 52 + \\
&+ a_{24} 53 + a_{25} 54 + a_{26} 55 + a_{27} 56 + a_{28} 57 + \\
&+ a_{29} 58 + a_{30} 59 + a_{31} 60 + a_{32} 61 + a_{33} 62 + \\
&+ a_{34} 63 + a_{35} 64 + a_{36} 65 + a_{37} 66 + a_{38} 67 + \\
&+ a_{39} 68 + a_{40} 69 + a_{41} 70 + a_{42} 71 = \\
&= a_1(4-3) + a_2(5-4) + a_3(3-5) + \\
&+ a_4(6-3) + a_5(7-6) + a_6(3-7) + \\
&+ a_7(8-3) + a_8(9-8) + a_9(3-9) + \\
&+ a_{10}(10-3) + a_{11}(11-10) + a_{12}(3-11) + \\
&+ a_{13}(12-3) + a_{14}(13-12) + a_{15}(3-13) + \\
&+ a_{16}(14-3) + a_{17}(15-14) + a_{18}(3-15) + \\
&+ a_{19}(16-3) + a_{20}(17-16) + a_{21}(3-17) + \\
&+ a_{22}(3-1) + a_{23}(2-3) + a_{24}(1-2) + \\
&+ a_{25}(18-19) + a_{26}(3-18) + a_{27}(19-3) + \\
&+ a_{28}(20-21) + a_{29}(3-20) + a_{30}(21-3) + \\
&+ a_{31}(3-22) + a_{32}(23-3) + a_{33}(22-23) + \\
&+ a_{34}(3-24) + a_{35}(25-3) + a_{36}(24-25) + \\
&+ a_{37}(3-26) + a_{38}(27-3) + a_{39}(26-27) + \\
&+ a_{40}(3-28) + a_{41}(29-3) + a_{42}(28-29) = 0
\end{aligned} \tag{10}$$

where a_i are constant. These will be determined from the following system, using (10):

$$\begin{aligned}
&a_3 - a_1 - a_4 + a_6 - a_7 + a_9 - a_{10} + a_{12} - a_{13} + a_{15} - \\
&- a_{16} + a_{18} - a_{19} + a_{21} + a_{22} - a_{23} + a_{26} - a_{27} + \\
&+ a_{29} - a_{30} + a_{31} - a_{32} + a_{34} - a_{35} + a_{37} - a_{38} + \\
&+ a_{40} - a_{41} = 0
\end{aligned} \tag{11}$$

$$a_1 - a_2 = 0 \tag{12}$$
$$a_2 - a_3 = 0 \tag{13}$$
$$a_4 - a_5 = 0 \tag{14}$$
$$a_5 - a_6 = 0 \tag{15}$$
$$a_7 - a_8 = 0 \tag{16}$$
$$a_8 - a_9 = 0 \tag{17}$$
$$a_{10} - a_{11} = 0 \tag{18}$$
$$a_{11} - a_{12} = 0 \tag{19}$$
$$a_{13} - a_{14} = 0 \tag{20}$$
$$a_{14} - a_{15} = 0 \tag{21}$$
$$a_{16} - a_{17} = 0 \tag{22}$$
$$a_{17} - a_{18} = 0 \tag{23}$$
$$a_{19} - a_{20} = 0 \tag{24}$$
$$a_{20} - a_{21} = 0 \tag{25}$$
$$a_{23} - a_{24} = 0 \tag{26}$$
$$a_{24} - a_{22} = 0 \tag{27}$$
$$a_{25} - a_{26} = 0 \tag{28}$$
$$a_{27} - a_{25} = 0 \tag{29}$$
$$a_{28} - a_{29} = 0 \tag{30}$$
$$a_{30} - a_{28} = 0 \tag{31}$$
$$a_{33} - a_{31} = 0 \tag{32}$$
$$a_{32} - a_{33} = 0 \tag{33}$$
$$a_{36} - a_{34} = 0 \tag{34}$$
$$a_{35} - a_{36} = 0 \tag{35}$$
$$a_{39} - a_{37} = 0 \tag{36}$$
$$a_{38} - a_{39} = 0 \tag{37}$$
$$a_{42} - a_{40} = 0 \tag{38}$$
$$a_{41} - a_{42} = 0 \tag{39}$$

The solution of this system is:

$$a_1 = a_2 = a_3 \tag{40}$$
$$a_4 = a_5 = a_6 \tag{41}$$
$$a_7 = a_8 = a_9 \tag{42}$$
$$a_{10} = a_{11} = a_{12} \tag{43}$$
$$a_{13} = a_{14} = a_{15} \tag{44}$$
$$a_{16} = a_{17} = a_{18} \tag{45}$$
$$a_{19} = a_{20} = a_{21} \tag{46}$$
$$a_{22} = a_{23} = a_{24} \tag{47}$$
$$a_{25} = a_{26} = a_{27} \tag{48}$$
$$a_{28} = a_{29} = a_{30} \tag{49}$$
$$a_{31} = a_{32} = a_{33} \tag{50}$$
$$a_{34} = a_{35} = a_{36} \tag{51}$$

$$a_{37} = a_{38} = a_{39} \tag{52}$$

$$a_{40} = a_{41} = a_{42} \tag{53}$$

Thus $\ker \partial_1$ becomes:

$$\ker \partial_1 = \left\langle \begin{array}{l} 30+31+32, 33+34+35, \\ 36+37+38, 39+40+41, \\ 42+43+44, 45+46+47, \\ 48+49+50, 51+52+53, \\ 54+55+56, 57+58+59, \\ 60+61+62, 63+64+65, \\ 66+67+68, 69+70+71 \end{array} \right\rangle = \underbrace{Z \oplus ... \oplus Z}_{14 \text{ times}} \tag{54}$$

Therefore

$$H_1(X) = \frac{\ker \partial_1}{\operatorname{Im} \partial_2} = \underbrace{Z \oplus .... \oplus Z}_{14 \text{ times}} \tag{55}$$

because

$$\operatorname{Im} \partial_2 = 0 \tag{56}$$

Case 2

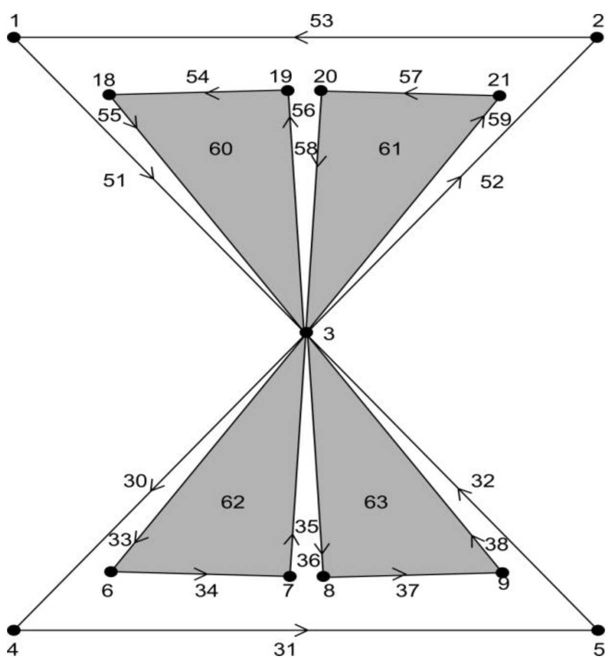

Fig. 4 The tensional strategy with minimal intensity

Vertices: 1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 19, 20, 21

Edges: 30, 31, 32, 51, 52, 53, 33, 34, 35, 36, 37, 38, 54, 55, 56, 57, 58, 59

Faces: 60, 61, 62, 63 (effective psychological tensions), having:

$\partial_2 60 = \langle 54+55+56 \rangle$, $\partial_2 61 = \langle 57+58+59 \rangle$

$\partial_2 62 = \langle 33+34+35 \rangle$, $\partial_2 63 = \langle 36+37+38 \rangle$

The chain complex for this case is:

$$0 \xrightarrow{\partial_3} C_2 \xrightarrow{\partial_2} C_1 \xrightarrow{\partial_1} C_0 \xrightarrow{\partial_0} 0 \tag{57}$$

$$\begin{aligned} \chi &= rank\ \mathrm{H}_0(X) - rank\ \mathrm{H}_1(X) + \\ &+ rank\ \mathrm{H}_2(X) = -1 \end{aligned} \tag{58}$$

Indeed

$$\begin{aligned} H_0(X) &= \frac{\ker \partial_0}{\operatorname{Im} \partial_1} = \\ &= \frac{\langle 1,2,3,4,5,6,7,8,9,18,19,20,21 \rangle}{\left\langle \begin{array}{l} 3-1, 2-3, 4-3, 5-4, 18-19, 3-18, \\ 20-21, 3-20, 6-3, 7-6, 8-3, 9-8 \end{array} \right\rangle} = Z \end{aligned} \tag{59}$$

On the other hand

$$\begin{aligned} &\partial_1 (a_1 30 + a_2 31 + a_3 32 + a_4 51 + a_5 52 + a_6 53 + a_7 33 + \\ &+ a_8 34 + a_9 35 + a_{10} 36 + a_{11} 37 + a_{12} 38 + a_{13} 59 + \\ &+ a_{14} 57 + a_{15} 58 + a_{16} 56 + a_{17} 54 + a_{18} 55) = \\ &= a_1 (4-3) + a_2 (5-4) + a_3 (3-5) + a_4 (3-1) + \\ &+ a_5 (2-3) + a_6 (1-2) + a_7 (6-3) + a_8 (7-6) + \\ &+ a_9 (3-7) + a_{10} (8-3) + a_{11} (9-8) + a_{12} (3-9) + \\ &+ a_{13} (21-3) + a_{14} (20-21) + a_{15} (3-20) + \\ &+ a_{16} (19-3) + a_{17} (18-19) + a_{18} (3-18) = 0 \end{aligned} \tag{60}$$

where a_i are constant. These will be determined from the following system, using (60):

$$\begin{aligned} &a_3 - a_1 + a_4 - a_5 - a_7 + a_9 - a_{10} + a_{12} + \\ &+ a_{15} - a_{13} - a_{16} + a_{18} = 0 \end{aligned} \tag{61}$$

$$a_1 - a_2 = 0 \tag{62}$$

$$a_2 - a_3 = 0 \tag{63}$$

$$a_6 - a_4 = 0 \tag{64}$$

$$a_5 - a_6 = 0 \tag{65}$$

$$a_7 - a_8 = 0 \tag{66}$$

$$a_8 - a_9 = 0 \tag{67}$$

$$a_{10} - a_{11} = 0 \tag{68}$$

$$a_{11} - a_{12} = 0 \tag{69}$$

$$a_{14} - a_{15} = 0 \tag{70}$$

$$a_{13} - a_{14} = 0 \tag{71}$$

$$a_{17} - a_{18} = 0 \tag{72}$$

$$a_{16} - a_{17} = 0 \tag{73}$$

The solution of this system is:

$$a_1 = a_2 = a_3 \tag{74}$$

$$a_4 = a_5 = a_6 \tag{75}$$

$$a_7 = a_8 = a_9 \tag{76}$$

$$a_{10} = a_{11} = a_{12} \tag{77}$$

$$a_{13} = a_{14} = a_{15} \tag{78}$$

$$a_{16} = a_{17} = a_{18} \tag{79}$$

Thus, $\ker\partial_1$ becomes:

$$\ker\partial_1 = \left\langle \begin{array}{l} 30+31+32, 33+34+35, \\ 36+37+38, 54+55+56, \\ 57+58+59, 51+52+53 \end{array} \right\rangle = \tag{80}$$

$$= \underbrace{Z \oplus \ldots \oplus Z}_{6 \text{ times}}$$

$$\operatorname{Im}\partial_2 = \left\langle \begin{array}{l} 33+34+35, 36+37+38, \\ 54+55+56, 57+58+59 \end{array} \right\rangle = \underbrace{Z \oplus \ldots \oplus Z}_{4 \text{ times}} \tag{81}$$

Therefore

$$H_1(X) = \frac{\ker\partial_1}{\operatorname{Im}\partial_2} = Z \oplus Z \tag{82}$$

Now let us calculate $H_2(X)$.

$$\begin{aligned} &\partial_2(a_1 60 + a_2 61 + a_3 62 + a_4 63) = \\ &= a_1(54+55+56) + a_2(57+58+59) + \\ &+ a_3(33+34+35) + a_4(36+37+38) = 0 \end{aligned} \tag{83}$$

where a_i are constant.

The solution for (83) is:

$$a_1 = a_2 = a_3 = a_4 = 0 \tag{84}$$

Thus $\ker\partial_2$ becomes:

$$\ker\partial_2 = 0 \tag{85}$$

Therefore

$$H_2(X) = \frac{\ker\partial_2}{\operatorname{Im}\partial_3} = 0 \tag{86}$$

because

$$\operatorname{Im}\partial_3 = 0 \tag{87}$$

Case 3

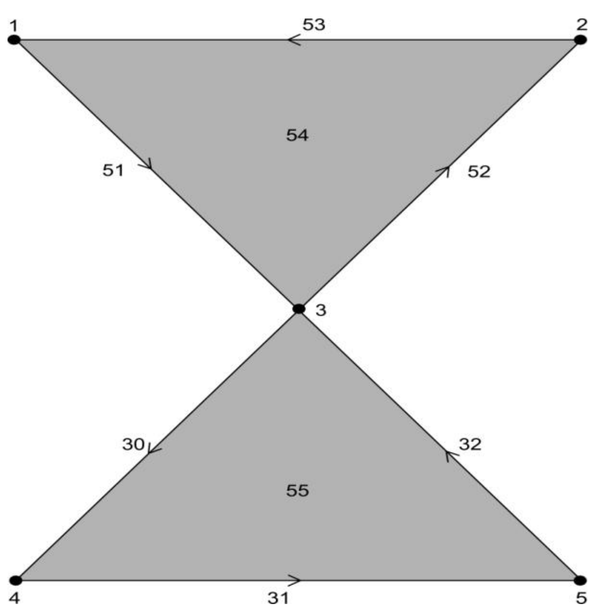

Fig. 5 The last sequence of tensional strategy

Vertices: 1, 2, 3, 4, 5

Edges: 30, 31, 32, 51, 52, 53

Faces: 54, 55 (effective psychological tensions), having:

$\partial_2 54 = \langle 51+52+53 \rangle$, $\partial_2 55 = \langle 30+31+32 \rangle$

The chain complex for this case is:

$$0 \xrightarrow{\partial_3} C_2 \xrightarrow{\partial_2} C_1 \xrightarrow{\partial_1} C_0 \xrightarrow{\partial_0} 0 \tag{88}$$

$$\begin{aligned} &\chi = rank\ \mathrm{H}_0(X) - rank\ \mathrm{H}_1(X) + \\ &+ rank\ \mathrm{H}_2(X) = 1 \end{aligned} \tag{89}$$

Indeed

$$H_0(X) = \frac{\ker\partial_0}{\operatorname{Im}\partial_1} = \frac{\langle 1,2,3,4,5 \rangle}{\langle 3-1, 2-3, 4-3, 5-4 \rangle} = Z \tag{90}$$

On the other hand

$$\begin{aligned} &\partial_1(a_1 30 + a_2 31 + a_3 32 + a_4 52 + a_5 53 + a_6 51) = \\ &= a_1(4-3) + a_2(5-4) + a_3(3-5) + a_4(2-3) + \\ &+ a_5(1-2) + a_6(3-1) = 0 \end{aligned} \tag{91}$$

where a_i are constant. These will be determined from the following system, using (91):

$$a_3 - a_1 - a_4 + a_6 = 0 \tag{92}$$

$$a_5 - a_6 = 0 \tag{93}$$

$$a_4 - a_5 = 0 \tag{94}$$

$$a_1 - a_2 = 0 \tag{95}$$

$$a_2 - a_3 = 0 \tag{96}$$

The solution of this system is:

$$a_1 = a_2 = a_3 \tag{97}$$

$$a_4 = a_5 = a_6 \tag{98}$$

Thus $\ker\partial_1$ becomes:

$$\ker\partial_1 = \left\langle \begin{array}{l} 30+31+32, \\ 52+53+51 \end{array} \right\rangle = Z \oplus Z \tag{99}$$

$$\operatorname{Im}\partial_2 = \left\langle \begin{array}{l} 30+31+32, \\ 52+53+51 \end{array} \right\rangle = Z \oplus Z \tag{100}$$

Therefore

$$H_1(X) = \frac{\ker\partial_1}{\operatorname{Im}\partial_2} = 0 \tag{101}$$

Now let us calculate $H_2(X)$.

$$\begin{aligned} &\partial_2(a_1 54 + a_2 55) = a_1(51+52+53) + \\ &+ a_2(30+31+32) = 0 \end{aligned} \tag{102}$$

The solution for (102) is:

$$a_1 = a_2 = 0 \tag{103}$$

Thus $\ker\partial_2$ becomes:

$$\ker\partial_2 = 0 \tag{104}$$

Therefore

$$H_2(X) = \frac{\ker\partial_2}{\operatorname{Im}\partial_3} = 0 \tag{105}$$

because

$$\operatorname{Im}\partial_3 = 0 \tag{106}$$

Case 4

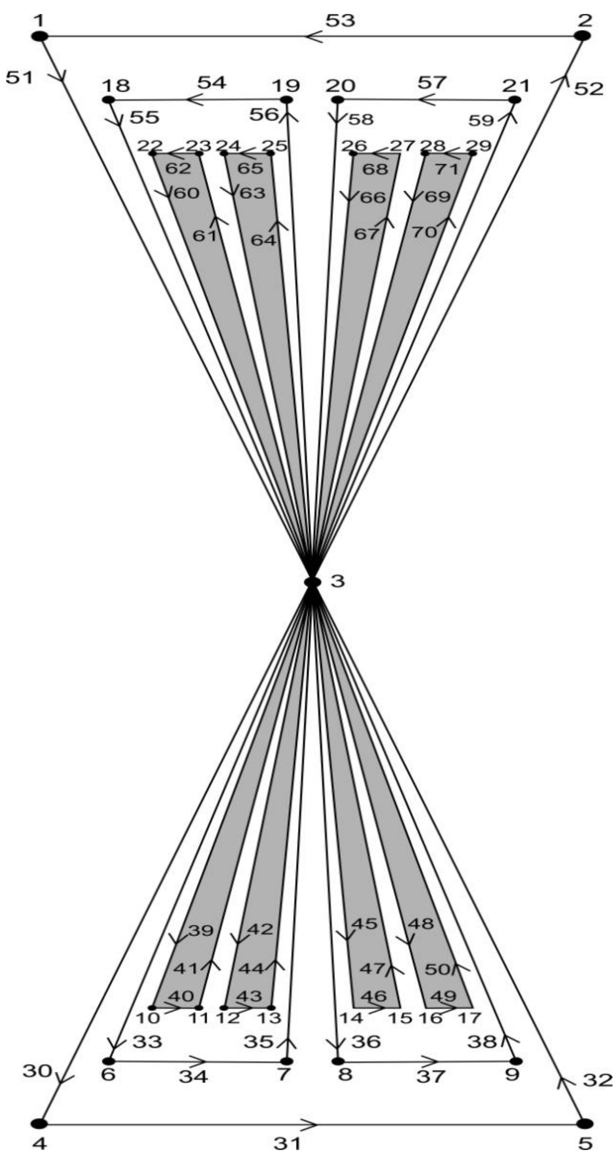

Fig. 6 The tensional strategy with maximal intensity

Vertices: $\overline{1-29}$; Edges: $\overline{30-71}$; Faces: 100, 101, 102, 103, 104, 105, 106, 107 (effective psychological tensions), having:

$\partial_2 100 = \langle 60+61+62\rangle$, $\partial_2 101 = \langle 63+64+65\rangle$

$\partial_2 102 = \langle 66+67+68\rangle$, $\partial_2 103 = \langle 69+70+71\rangle$

$\partial_2 104 = \langle 39+40+41\rangle$, $\partial_2 105 = \langle 42+43+44\rangle$

$\partial_2 106 = \langle 45+46+47\rangle$, $\partial_2 107 = \langle 48+49+50\rangle$

The chain complex for this case is:

$$0 \xrightarrow{\partial_3} C_2 \xrightarrow{\partial_2} C_1 \xrightarrow{\partial_1} C_0 \xrightarrow{\partial_0} 0 \tag{107}$$

$$\chi = rank\ \mathrm{H}_0(X) - rank\ \mathrm{H}_1(X) + \\ + rank\ \mathrm{H}_2(X) = -5 \tag{108}$$

Indeed

$$H_0(X) = \frac{\ker\partial_0}{\operatorname{Im}\partial_1} =$$

$$= \frac{\langle 1,2,\ldots,29\rangle}{\left\langle \begin{array}{l} 5-4, 3-5, 2-3, 1-2, 7-6, 3-7, 9-8, \\ 3-9, 21-3, 20-21, 19-3, 18-19, 11-10, \\ 3-11, 13-12, 3-13, 15-14, 3-15, 17-16, \\ 3-17, 3-22, 22-23, 3-24, 24-25, \\ 3-26, 26-27, 3-28, 28-29 \end{array} \right\rangle} = Z \tag{109}$$

On the other hand

$$\begin{aligned}
&\partial_1 (a_1 31 + a_2 32 + a_3 30 + a_4 52 + a_5 53 + a_6 51 + a_7 34 + \\
&+ a_8 35 + a_9 33 + a_{10} 36 + a_{11} 37 + a_{12} 38 + a_{13} 56 + \\
&+ a_{14} 54 + a_{15} 55 + a_{16} 59 + a_{17} 57 + a_{18} 58 + a_{19} 39 + \\
&+ a_{20} 40 + a_{21} 41 + a_{22} 42 + a_{23} 43 + a_{24} 44 + a_{25} 45 + \\
&+ a_{26} 46 + a_{27} 47 + a_{28} 48 + a_{29} 49 + a_{30} 50 + a_{31} 61 + \\
&+ a_{32} 62 + a_{33} 60 + a_{34} 66 + a_{35} 67 + a_{36} 68 + a_{37} 69 + \\
&+ a_{38} 70 + a_{39} 71 + a_{40} 64 + a_{41} 65 + a_{42} 63) = \\
&= a_1(5-4) + a_2(3-5) + a_3(4-3) + a_4(2-3) + \\
&+ a_5(1-2) + a_6(3-1) + a_7(7-6) + a_8(3-7) + \\
&+ a_9(6-3) + a_{10}(8-3) + a_{11}(9-8) + a_{12}(3-9) + \\
&+ a_{13}(19-3) + a_{14}(18-19) + a_{15}(3-18) + \\
&+ a_{16}(21-3) + a_{17}(20-21) + a_{18}(3-20) + \\
&+ a_{19}(10-3) + a_{20}(11-10) + a_{21}(3-11) + \\
&+ a_{22}(12-3) + a_{23}(13-12) + a_{24}(3-13) + \\
&+ a_{25}(14-3) + a_{26}(15-14) + a_{27}(3-15) + \\
&+ a_{28}(16-3) + a_{29}(17-16) + a_{30}(3-17) + \\
&+ a_{31}(23-3) + a_{32}(22-23) + a_{33}(3-22) + \\
&+ a_{34}(3-26) + a_{35}(27-3) + a_{36}(26-27) + \\
&+ a_{37}(3-28) + a_{38}(29-3) + a_{39}(28-29) + \\
&+ a_{40}(25-3) + a_{41}(24-25) + a_{42}(3-24) = 0
\end{aligned} \tag{110}$$

where a_i are constant. These will be determined from the following system, using (110):

$$\begin{aligned}
&a_2 - a_3 - a_4 + a_6 + a_8 - a_9 - a_{10} + a_{12} - a_{13} + a_{15} - \\
&- a_{16} + a_{18} - a_{19} + a_{21} - a_{22} + a_{24} - a_{25} + a_{27} - a_{28} + \\
&+ a_{30} - a_{31} + a_{33} + a_{34} - a_{35} + a_{37} - a_{38} - a_{40} + a_{42} = 0
\end{aligned} \tag{111}$$

$$a_5 - a_6 = 0 \tag{112}$$

$$a_4 - a_5 = 0 \tag{113}$$

$$a_3 - a_1 = 0 \tag{114}$$

$$a_1 - a_2 = 0 \quad (115)$$
$$a_9 - a_7 = 0 \quad (116)$$
$$a_7 - a_8 = 0 \quad (117)$$
$$a_{10} - a_{11} = 0 \quad (118)$$
$$a_{11} - a_{12} = 0 \quad (119)$$
$$a_{19} - a_{20} = 0 \quad (120)$$
$$a_{20} - a_{21} = 0 \quad (121)$$
$$a_{22} - a_{23} = 0 \quad (122)$$
$$a_{23} - a_{24} = 0 \quad (123)$$
$$a_{25} - a_{26} = 0 \quad (124)$$
$$a_{26} - a_{27} = 0 \quad (125)$$
$$a_{28} - a_{29} = 0 \quad (126)$$
$$a_{29} - a_{30} = 0 \quad (127)$$
$$a_{14} - a_{15} = 0 \quad (128)$$
$$a_{13} - a_{14} = 0 \quad (129)$$
$$a_{17} - a_{18} = 0 \quad (130)$$
$$a_{16} - a_{17} = 0 \quad (131)$$
$$a_{32} - a_{33} = 0 \quad (132)$$
$$a_{31} - a_{32} = 0 \quad (133)$$
$$a_{41} - a_{42} = 0 \quad (134)$$
$$a_{40} - a_{41} = 0 \quad (135)$$
$$a_{36} - a_{34} = 0 \quad (136)$$
$$a_{35} - a_{36} = 0 \quad (137)$$
$$a_{39} - a_{37} = 0 \quad (138)$$
$$a_{38} - a_{39} = 0 \quad (139)$$

The solution for this system is:

$$a_1 = a_2 = a_3 \quad (140)$$
$$a_4 = a_5 = a_6 \quad (141)$$
$$a_7 = a_8 = a_9 \quad (142)$$
$$a_{10} = a_{11} = a_{12} \quad (143)$$
$$a_{19} = a_{20} = a_{21} \quad (144)$$
$$a_{22} = a_{23} = a_{24} \quad (145)$$
$$a_{25} = a_{26} = a_{27} \quad (146)$$
$$a_{28} = a_{29} = a_{30} \quad (147)$$
$$a_{13} = a_{14} = a_{15} \quad (148)$$
$$a_{16} = a_{17} = a_{18} \quad (149)$$
$$a_{31} = a_{32} = a_{33} \quad (150)$$
$$a_{40} = a_{41} = a_{42} \quad (151)$$
$$a_{34} = a_{35} = a_{36} \quad (152)$$
$$a_{37} = a_{38} = a_{39} \quad (153)$$

Thus $\ker\partial_1$ becomes:

$$\ker\partial_1 = \left\langle \begin{array}{l} 30+31+32, 52+53+51, \\ 33+34+35, 36+37+38, \\ 54+55+56, 57+58+59, \\ 39+40+41, 42+43+44, \\ 45+46+47, 48+49+50, \\ 60+61+62, 66+67+68, \\ 69+70+71, 63+64+65 \end{array} \right\rangle \quad (154)$$

$$\mathrm{Im}\,\partial_2 = \left\langle \begin{array}{l} 39+40+41, 42+43+44, \\ 45+46+47, 48+49+50, \\ 60+61+62, 63+64+65, \\ 66+67+68, 69+70+71 \end{array} \right\rangle \quad (155)$$

Therefore

$$H_1(X) = \frac{\ker\partial_1}{\mathrm{Im}\,\partial_2} = \underbrace{Z \oplus ... \oplus Z}_{6\ \text{times}} \quad (156)$$

Now let us calculate $H_2(X)$.

$$\partial_2 \begin{pmatrix} a_1 104 + a_2 105 + a_3 106 + a_4 107 + \\ + a_5 100 + a_6 101 + a_7 102 + a_8 103 \end{pmatrix} =$$
$$\begin{aligned} &= a_1(39+40+41) + a_2(42+43+44) + \\ &+ a_3(45+46+47) + a_4(48+49+50) + \\ &+ a_5(60+61+62) + a_6(63+64+65) + \\ &+ a_7(66+67+68) + a_8(69+70+71) = 0 \end{aligned} \quad (157)$$

The solution for (157) is:

$$a_1 = a_2 = a_3 = a_4 = a_5 = a_6 = a_7 = a_8 = 0 \quad (158)$$

Thus $\ker\partial_2$ becomes:

$$\ker\partial_2 = 0 \quad (159)$$

Therefore

$$H_2(X) = \frac{\ker\partial_2}{\mathrm{Im}\,\partial_3} = 0 \quad (160)$$

because

$$\mathrm{Im}\,\partial_3 = 0 \quad (161)$$

IV. CONCLUSION

The paper presents a geometrical point of view about the functionality of tensional psychological dynamics. This approach is in agreement with Jung's psychoanalytical theory and tries to identify a plausible topological construction of the tensional psychological device.

The mechanism of the tensional dynamics consists of the following elements: a generator of psychological energy, a device which translates this energy into a diffuse psychological tension and a mechanism which translates the diffuse psychological tension into a tensional strategy capable of gratifying the tensional focus.

The psychological system operates with two levels of tensional intensity. Each level assures the necessary tensional resources in order to make possible the manifestation of any tensional need and saturation.

Each tensional strategy adopted by the psychological system could be represented as a topological space. There are three such strategies which are represented by the Euler characteristics, as topological invariants, respectively -5, -1 and 1. Moreover, there is an initial moment of the psychological construct described by an Euler characteristic which is equal to -13.

The tensional strategies adopted by the psychological system are independent, at least at the conscious instance. The choice of a strategy is subordinated to a personalized sense recognized by the unconscious instance.

Each person is endowed with psychological feelings. In every moment of life some of these feelings become active. The feelings manifest at the level of the person and / or at the level of the other persons who receive them. When these (feelings) are active, the unconscious instance, which is connected to the personalized sense, induces a maximal or a minimal tensional intensity in order to create a psychological state capable of endowing the person or the other persons with the potentiality of accessing the information. The accessed information makes possible the progress at the level of the person, of the group(s) and so on, up to the level of the human species.

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