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Borders, Tensegrity and Development in Dialogue

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Abstract

In this article we propose a development of the Dialogical Self Theory by introducing the notions of borders, cogenetic logic and tensegrity that we have elaborated during the last 5 years, in order to introduce a stronger developmental and dynamic perspective within the theory. We start from the discussion of some recent advancements of the model proposed by Hermans et al. (*Integrative Psychological and Behavioural Science, 51*(4), 2017), who refer to the metaphor of democratic society of the Self to understand the challenges and possible directions of adaptation that the persons can face in those border-crossing processes characterizing contemporary western societies. We conceptualized the Self as a dynamic semiotic system in constant evolutive tension, rather than a system in equilibrium adapting to the environmental changing conditions. Then, we propose to replace the concept of stability and continuity of the Self with the more fruitful idea of tensional integrity.

Keywords

Introduction

AQ1

During the year 120 AC, the Roman emperor Hadrian commanded the construction of an enormous wall: Vallum Hadriani in Latin. It was a defensive fortification in the northern limit of the Roman province of Britannia, that ran from coast to coast at the border with the lands of the Ancient Britons, including the Picts (Breeze 2014). For more than four centuries, the Hadrian Wall represented the largest artifacts built by the Romans. It was originally meant as a defensive structure against the not-yet subjugated tribes of north Britons, yet as any type of border it was playing several different and ambivalent roles. The Wall was also the starting point for any military campaign of the Romans and represented the crystallization of the maximum northern expansion of Roman Empire. It was a way to keep Picts out of the Roman territory, but also to confine the "barbarians" into the "reservation" at the northern tip of Britannic island.

Finally, its gates were places of commerce and customs. History should represent a lesson to human beings, the "bordering creature that has no border" (Simmel 1994, p. 10), that still try to build walls without acknowledging that every border is ambivalent and permeable in itself. Any established distinction is also opening a connection, and any crossing is also a new bordering (Marsico 2011; Tateo 2016a).

In their article Hermans et al. (2017), propose a new possible metaphor to explore the complexity of the relationship between Self and Society. Based on an axiomatic isomorphism of the organization of the Self and the social system at large, the authors introduce and discuss the democratic society metaphor for understanding the way in which the Dialogical Self works in the contemporary globalized boundary-crossing world.

By exploring three different perspectives of multicultural, multiracial and transgender identity, Hermans et al. (2017) try to show the fruitfulness of the democratic metaphor to conceptualize the way in which the self-system develops in the fields of tension between opposite Self-positions. Such fields of tension emerge as a result of a positioning and counter-positioning process in the arena of the power-laden society where distinctive cultural value system, promoted by societal institutions and historical traditions, provide the Self with both opportunities and constraints for development. The Self as a part of the society strives to find its personal identity synthesis (that can be adaptive or maladaptive) within the societal power structures, including the possibility of new identity positions to emerge.

In analogy with the ideal model of the Democracy in society, the "democratic self" metaphor should give space for the free expression of all the different and opposing *I*-positions which are in a dialogical relationship in the mini-society of the mind.

In the final part of the article, Hermans et al. (2017) discuss the multicultural, multiracial and transgender issues with respect to a broader social and global context, where a theoretical link between the personal, social, and global inclusiveness and the concept of cosmopolitan democracy. The authors then propose a model for the articulation of the field of tension between Self and Other on three different levels of inclusiveness, whose highest form should lead to the development of global consciousness that should be expressed in the form of "We as human".

This model opens a set of potential new research directions as in the case of the emergence of possible new hybrid *I*-positions either at the interface of the Self

and the Other or in between different levels of inclusiveness. Another potential direction to be explored is how we as humans cope with the uncertainty in the I-Other relationship at personal, social and human level in a globalized contemporary society.

"Rediscovering" Tension

Hermans et al. (2017) have the merit to put forward topics such as borders (Marsico 2011, 2016; Marsico et al. 2013; Marsico and Varzi 2016), tension and tensegrity (Tateo 2012; Tateo and Marsico 2013), the field of meaning in the semiotic construction of the Self (Tateo 2014a, 2014b) and the dialogical relationship between complementary meanings (Tateo 2015, 2016a). Hermans et al. (2017) stress how the role of the polyphonic societal influences in the development of the self-society should be understood as a field of tension that emerges in the dialogical elaboration of the different instances. For example, with respect to the multiple cultural, racial and gender identities, they claim, "the concurrence of adaptation and maladaptation signifies the 'tension' aspect of the contact zones" (Hermans et al. 2017 p. 7).

Hermans et al. (2017) is aiming at overcoming a model of static equilibrium which is still predominant in psychology. The "current" understanding psyche is indeed based on a view of tension as perturbation of the organismic balance that must be reduced by a homeostatic process. The psyche in this view works like a pendulum: when an environmental force is applied, the system is excited and initiate a set of actions in order to regain a new state of equilibrium, though different from the initial one. In this view, what matters is the system memory of the initial state, the concepts of balance (as the tensions produced by the event must be overcome and the dissonance must be restored), the normativity of the state of equilibrium and the idea that an external force must be applied in order to start the process of change. Any modification in the equilibrium of such a system is also a risk for the identity of the organism identity itself. By using the combination of the concepts of "tension", "border", "maladaptation" and "adaption", Hermans et al. (2017) are still working within this framework.

Few years ago, we have instead proposed a more radical perspective (Tateo and Marsico 2013). The psyche should understood in terms of a tensegrity system: that is, a system in which the organizing principle is not equilibrium and homeostasis rather dynamic tension. In this kind of system, endogenous and exogenous forces, tension and compression are at work to create a state of "tensegrity" (Tateo and Marsico 2013) in which the organism's integrity is based on a state of constant dynamic pre-tension that ensures both flexibility and stability over time. What becomes relevant is then the future state that the

system is striving for. Identity is conceived as movement, thus change cannot affect its integrity. Such a kind of system can perfectly deal with ambivalence and tension. Development can always take place and maladaptation in this case can only emerge by introducing an external normative position (Tateo 2016b). The metaphor for such a system could be the perpetual motion machine, able to produce its own energy using the tension between endogenous and exogenous forces to trigger change. In the following sections of the article, we will try to illustrate the basic concepts of the Self as a system of dynamic tension. First, we will present the concept of borders, then we will discuss the border zone as the place of development and finally we will propose the concept of self as a tensegrity system.

## What Boundary-Crossing World we are Talking about?

Hermans et al. (2017), show all the contradictions that cultural, racial, and gender positions undergo in the fields of tension in a border-crossing, globalizing society. But what boundary-crossing[1] world we are talking about?

The border is becoming a more and more central concept in the scientific debate regarding the relationship between person and context as well as the process of individual and collective identity construction (Marsico 2016). Yet, there is still a rigidity in the way it has been so far conceptualized. Borders are not as fixed as they appear, neither in practice nor in meaning. Borders are rather in motion, they are movable and the making and unmaking of borders is just a matter of time (Davies 2011). This is evident both at macroscale - if we look at the socio-political borders of the Nations over the centuries (Fig. 1) - and at microscale - for instance, in the recent past of the urbanization process worldwide.

Fig. 1

Border walls and fences (Countries in dark grey have built barriers. Countries in light grey have not built barriers. Borders with fenced sections: in red completed or under construction; in green planned. Sources: Élisabeth Vallet, Josselyn Guillarmou, and Zoé Barry, Raoul-Dandurand Chair, University of Quebec in Montreal; *The Economist,* http://www.economist.com/blogs/graphicdetail/2016/01/daily-chart-5)

AQ2
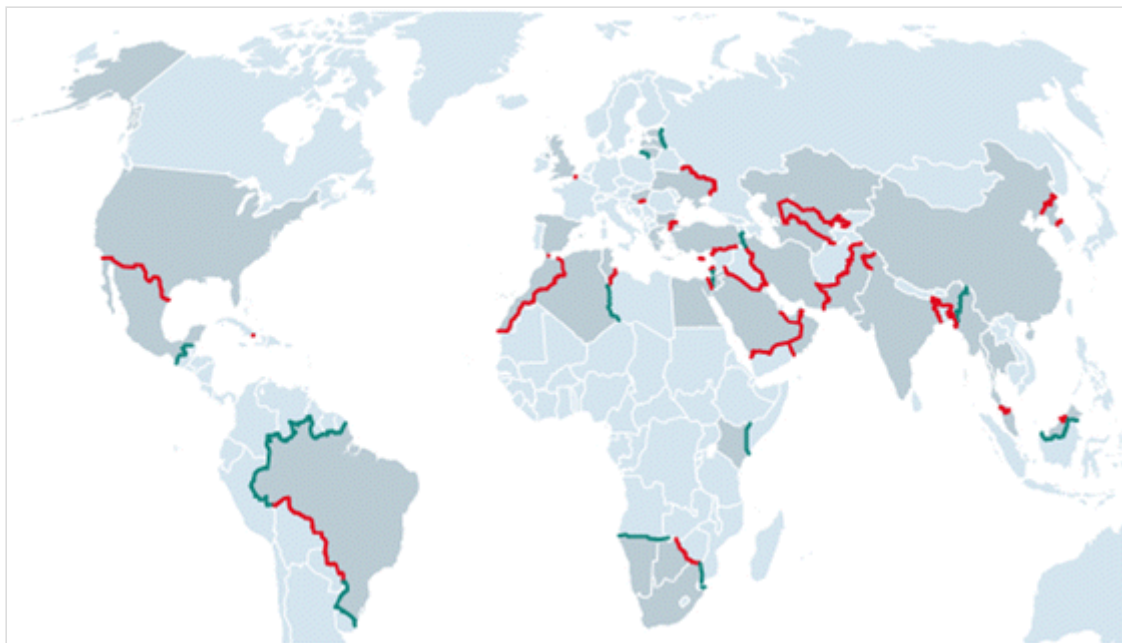
One clear example, that helps to identify motion in bordering process, is the case of the "Schengen Area". It is the result of a contractual agreement consequently allowing free movement of people within European countries, but also the occasion to create new external borders, replaced somewhere "outside there" with great impact at very many different levels: from the subjective or affective ways of experiencing that phenomenon (who and where the foreigner is?), to the societal level (entry procedures, visa controls, new European agencies for borders control, etc.) (*Marsico* Marsico should not go in italic   2016*).*

Usually, borders are conceived in dichotomic terms ("in <> out", "here <> there", "home <> street") and fashioned in dialectic and opposed forces instead of processes that connect and divide the parts in a relationship of "inclusive separation" (Valsiner 1987). The recent attempt to reframe the notion of Border in the perspective of Cultural Psychology (Marsico 2016; Marsico and Varzi 2016) aims exactly at underlying the processual nature of borders, that are not rigid, visible and linear entities, but "Border Zones" where motions, actions and human agency are made possible and widely promoted in this liminal area.

Crossing borders is intrinsic to human beings, both historically and ontogenetically, both on micro and macro scale, and it is one of the specific characteristic, for instance, of childhood. Border controls and parental decisions somehow limit children's ability to move, as well as their freedom to make and enact decisions concerning where and with whom they feel to belong (Konrad 2015). However, borders cannot be reduced to mere tools for cultural control, they are also performative arenas. The three cases of people with multicultural, multiracial and transgender backgrounds discussed by Hermans et al. (2017), show exactly how border zones are "developmental places" for very many different socio-cultural and psychological processes at the interface between Self

and Society, where the power-laden institutional restrictions of culture, race and gender are noting but bounded categories to be crossed. Yet, in any boundary-crossing there is a re-affirmation of the border itself in its regulatory function at individual and collective level. How is it possible?

When one identifies differences and creates distinctions between individuals, groups, things or events, one also automatically creates boundaries that refer to such distinctions and set the stage for human action, determining the respective belongings. Making distinctions, creating identifications and belongings are simultaneously opposite and complementary functions in the process of borders construction. As we will specify in the next section, the existence of differences allows to build borders and binds our psychological and socio-cultural territories within dynamic contours. Yet in parallel, the same borders act in recognizing, maintaining, underlying and sometimes reinforcing these differences.

Tracing a border is an action of differentiation based on certain criteria. Hence, within the new established entity (i.e. group, territory, category etc.) those units (i.e. individuals, things, dimensions etc.) that meet the selected criteria will be included and acquire a special value, while the others that do not have those characteristics will be excluded. As a result, once a boundary is traced, it operates to strengthen this distinction, reducing the internal differences and making possible the perception, construction or even the invention of a homogeneous unit. The border making process determines at the same time what might be included in the "bounded region" and what instead should stay out (Marsico 2017). Yet, every single specific border can be crossed:

> "People with multiple identities are involved in a struggle to transgress the closed boundaries of power-laden binaries (e.g., Indian *or* American, black *or* white, man *or* woman) and are faced with obstacles to move freely among a larger variety of in-between positions which better fit their self experience" (Hermans et al. 2017, p.)

Nevertheless, Hermans et al. (2017) do not say that the border and the conditions for crossing it emerge altogether (Marsico 2016; Marsico and Varzi 2016). For instance, Hermans et al. (2017) report the study of Rockquemore et al. (2009) with the case of the student Christy, who in her college application chooses to tick the "Black" racial background box in the form, despite her real background is multiracial, to get a benefit in the admission process. The original study of Rockquemore et al. (2009) interprets this example as a negotiation between the definition of "her own identity on the basis of her internal self; she knows that

she is identified differently by others; and she makes an adaptive choice between the identity categories provided by the institution" (Hermans et al. 2017, p.). This negotiation takes place on the basis of a tension created by the different definitions available. But, the twofold nature of bordering process is that of creating both the distinctions and the conditions for their overcoming: borders are for crossing, yet in such acts we find or create a new border. Besides, by crossing the borders we confirm their own reality (Simmel 1918/2010). One could interpret Christy's case also in terms of complementarity between the creation of a distinction ("Black") and its complement ("non-Black"). This distinction constitutes a *social membrane* (Marsico 2017), a condition that allows different forms and magnitude of both separation, crossing and inclusion. In fact, Christy has the possibility of playing with her personal racial identity and institutional racial identification to the extent that she is both included and excluded from a specific group by the permeability of the social membrane. So rather than interpreting this phenomenon in terms of tension between different positions created by the influence of the social norms, we can see it as a condition of structural tension emerging from the dialogical nature of the border. In order to do so, we must introduce a further concept that is fundamental in understanding any process of border-construction and border-crossing but is missing in Hermans et al. (2017): the co-genetic logic.

The Cogenetic Logic

Tateo (2016a) has developed an epistemological argumentation based on the project of a behavioral logic created by David P. G. Herbst (1976). In the understanding of human phenomena, we need to identify triadic systems in which a third is always acting as developmental operator. If one conceptualizes differences in terms of binary oppositions (e.g. male-female; black-white; Western-Eastern; public-private, etc.), the possibility of development is not taken into account:

> "In a dual system […] there is only the possibility of identity maintenance, but not of identity development […]. What is needed is a triadic system in which one of the elements acts as a transformational operator" (Tateo 2016a, p. 444).

Herbst (1976) studied the phenomenology of experiential modes in "the relation between our intentions and the conceptual and rational forms in terms of which we perceive and respond to ourselves and the environment" (Herbst 1976, p. 84). He identified the primary operation, the genetic basis of logic and behavior, that is the production of a single *distinction* in the undistinguished field or flow of

events, which actualizes a triadic set of elements [m, n, p] (Fig. 2): "The primary conceptual unit is given as a triad of distinguishable undefined components, which are definable in terms of one another" (Herbst 1976, p. 90).

**Fig. 2**

Herbst's triadic set
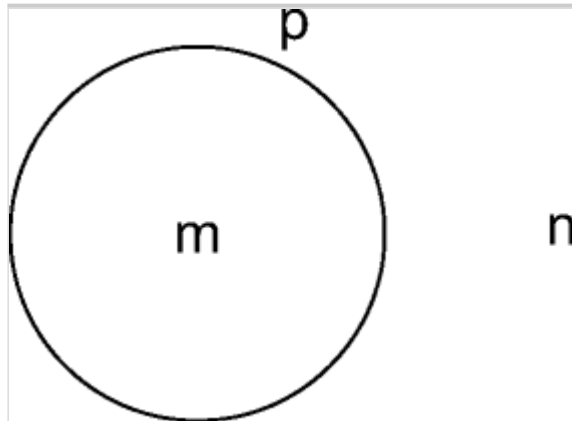
By a single action of drawing the border "p", a previously undistinguished original state we obtain an element "m", which is internal to the distinction, and an element "n" which is external. Through "the removal of the boundary, a distinction between inside and outside is no longer possible. The same result is obtained if either the inside or the outside is eliminated, for then also the other two components of the triad disappear as well" (Herbst 1976, p. 89). It seems easy to provide several examples of the systems of triads: a) [inside, outside, boundary]; b) [finite region, infinite region, boundary]; c) [being, non-being, boundary]; d) [male, female, boundary]; e) [Indian, American, boundary]. These examples clearly show how removing one of the elements of the triad makes the other disappear or become indistinguishable. Yet, while the ontological negation of being is non-being, the logical negation of the examples [b, d, e] is incorrect, because the negation of the concept does not consist of a different concept. In strictly logical terms, indeed, the negation of a concept is the non-concept, while the features of language lead us to define the negation in terms of the counter-concept that we oppose by habit, or experience. The logical negation of the concept "A" is a closed set (whose limits are defined by the distinction), while the its negation ("non-A") is its complement and an open set, an infinite field of possibilities (Rudolph 2013), that is "A" has properties that are delimitated by "not-being-non-A". For instance, the triad (d) should logically read [male, non-male, boundary], in which non-male would include all the possible instances of non-A. Yet in language we crystallize some oppositions as they are functional to specific systems of values. As we will argue in the next pages, how people name the "non-A" instances can make a huge difference in terms of outcomes.

The relationship between "A" and "non-A" has a special kind of semantic between two complementary spaces of meaning: the closed set, the boundary and the open set are co-defined as they cannot exist outside of the triadic system (Fig. 4). Yet persons and groups attach different values to the sub-sets, in the very moment the distinction emerges (Tateo 2016a). The painter Paul Klee (1879–1940) nicely illustrates this basic principle in his notebooks (Klee 1961): we find concepts only in the form of opposite pairs with a gradient (Fig. 3).

Fig. 3

Complementary concepts according to Paul Klee (1961, p. 18)

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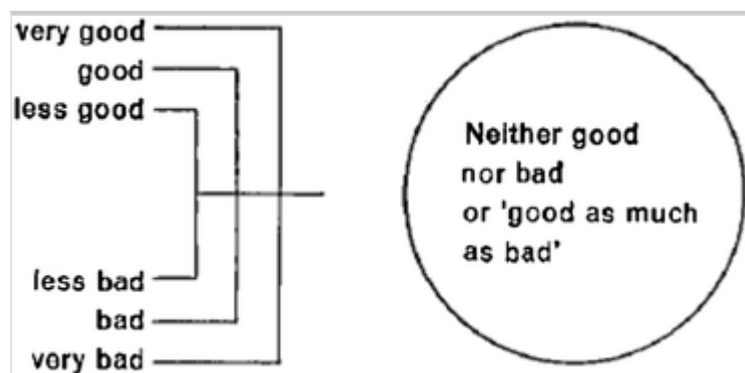
AQ3

What remains fixed is the "central point" (Klee 1961, p.15), that is the distinction we establish to define the pair of concepts: the border zone. Klee (1961) overcomes dualism by considering the dialogical unity (inclusive separation) between couples of opposite ideas: the bad cannot exist without defining its contrary, there is no centre without a periphery, yet the quality of their relationship depends upon the direction of the movement and counter-movement the person can take with respect to her positioning. This movement is determined by a certain degree of preference or value charging of one sub-part compared to the other (Valsiner 1987). For instance, one of the crucial issues in contemporary Western states, facing the migration phenomena and the multicultural societies, is that of creating a clear-cut definition of citizenship. Depending on the distinction/border that is established (e.g. right of birth, job contract, years of residence, taxpaying, etc.) on closed set of "citizen" will be defined and an asymmetry in value is immediately produced (Fig. 4). From classical social psychology we learn that "we as X, Y or Z" has attached a different value than "you as X, Y or Z" or than "they as X, Y or Z".

Fig. 4

Inclusive separation citizen<>non-citizen
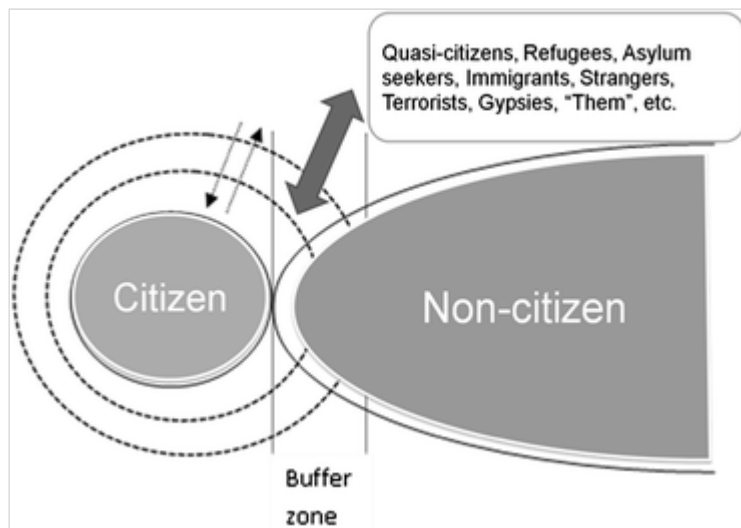
At the same time, an open set "non-citizen" will emerge - including an infinite number of potential instances (e.g. quasi-citizen, not-yet citizen, foreigner, enemy, refugee, etc.) – and will create a semantic space of indeterminacy which allows the emergence of new meanings (Valsiner 1995, 2014). This dynamic liminal space, a buffer zone of meaning-making guides the collective development of the society toward a more limited range of possible alternatives, maintaining in such a way the balance between production and reproduction of social dynamics. Taking into account the temporal dimension of the triad, we obtain a triadic description of a process: [preceding state, subsequent state, operation] (Herbst 1976; Valsiner 2014). "Non-A" is an open sub-set also in temporal sense, to the extent that something that was before included in the category "non-A" can become, after a more or less long period of time, included in the category "A" (for instance through assimilation, integration, etc.), or the other way round. The bounded region (A), though remaining a closed set, can dynamically expand or constrict over time in the relationship with the open set (non-A) in the buffer region corresponding to the marginal instances of the system's integrity. Societal change emerges exactly in that liminal area of quasi-citizens or marginal figures which can eventually become either fully "citizen" or fully "strangers".

That's why also Hermans et al. (2017) find so relevant all those forms of hybridization and marginality that dwell in buffer zones, and whose symbolic and material status can develop over time. For instance, all the different categories of immigrants, refugees, nomads, etc. which are dynamically set as A<>non-A in the different conditions over time, probably always dwelling in the buffer zone, but changing as soon as the bounded region is expanding or constricting (dotted circles in Fig. 4). Yet, what happens when we apply this logic to the society of self?

In Hermans et al. (2017) metaphor:

"the self can be democratic only if these dominant positions contribute to decision making after consultation of and in dialogue with *I*-positions which are less dominant in the self. Dominant positions are part of a democratic organization if they respect and care for the development of less dominant and minority positions, including their wishes and purposes, as an expression of the value of equality in democratic relationships" (p. 7)

This process of negotiation between different positions is generating a field of tension and at the same time is creating the possibilities for new hybrid meanings to emerge. Between two or more conflicting *I*-positions, a third position can emerge able to reconcile the tension and integrate the self-system. When this negotiation is not allowed by some authoritative *I*-position, then a potential form of maladaptation can occur (Hermans et al. 2017).

The Example of Gendering

If we expand Hermans et al. (2017) idea by applying the dynamic of borders and co-genetic logic, we can see how within the self-system societal influences are not just internalized in the form of single positions, rather in the form of triadic systems [A, non-A, border]. In the different trajectories of transgender persons (Grossman et al. 2005), for instance, it appears evident how the socially available dual body (male *or* female) and gender (masculine or feminine) categorization inhibits the possibility for the person to position herself in a socially meaningful and acceptable place. Hermans et al. (2017) interpret transgender successful adaptation in term of fluidity and capability of crossing borders between institutionalized gender identities that generate field of tension. Yet the studies on queer sexualities have shown how the transgender identities have generated new forms of gender distinction in the very moment in which they were crossing the pre-existing boundaries (Manalansan 2006). Thus, rather than conceptualizing the self polyphony in terms of "democratic" dialectics between *I*-positions that find a third position of synthesis, we would rather view the process a s a dynamic tensions in which gender positions are co-defined within a set including of complementary counter-position and a border (Fig. 5).

Fig. 5

Co-genetic logic and gendering
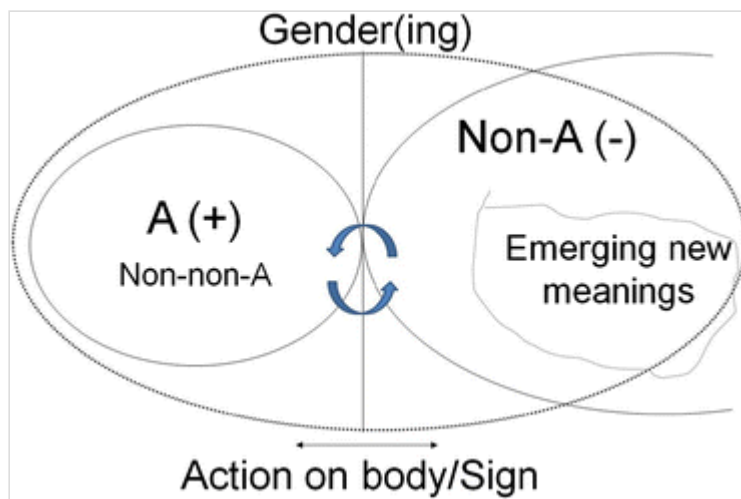
For instance, "masculinity" (A) in a given society is defined by a set of properties and by its complementary set of "non-masculinity" (non-A). The border between the two field of meaning is represented by some action or signs (often related to or operated on the body). Thus a male is someone who does masculine stuff but also who does not feminine stuff (not non-A). The field of "non-masculine", in return, includes a number of infinite instances that goes from the "feminine" to the "quasi-masculine", from the "gay" to the "non-masculine". In the border zone, we can find a number of actions and signs that in the course of time can move from one field of meaning to the other (e.g. beauty treatments, tattoos, accessories, etc.: circular arrows in Fig. 5). Any action of border crossing is moving the border between the two fields and establishing a new distinction at the same time. In the same vein, any action upon the body represents a sign whose meaning is determined by the complementarity between its being more or less "masculine", "non-masculine" "almost feminine" "totally feminine", etc. Besides, when masculinity is defined through its opposite, it acquires a further nuance of meaning as "not non-masculine". That is the fields of meaning created through inclusive separation constitute a whole in which an *I*-position as masculine is characterized also by avoiding "non-masculine" things and by its being "non feminine". Only this triadic system can ensure the necessary fluidity to enable the negotiation and development of life trajectories within a societal system of meanings where any border crossing is at the same time a border confirming. In such a logic, the tension is no longer a temporary element generated by the friction of different social fields reverberating at the level of the self-system. Tension rather becomes an integral part of the system of inclusive separation that characterizes any identity definition (I as someone but also I as non-someone else and a permeable border that allows element from one field into the other). In the following section we will provide a theoretical expansion that will account tension as an inherent element of the self-system necessary to development by continuity and discontinuity.

Tensegrity

According to Hermans et al. (2017) the tension in the system of Self is generated when two or more *I*-positions are oriented in different directions pulled by societal tendencies or cultural orientations. For instance, the identification with multiple racial or ethnic groups identity can generate a field of tension between identities, as the different groups have a different social recognition in terms of dominant/minority status (Hermans et al. 2017). Thus, the tensions between different *I*-positions in the self-system are mirroring some cultural fields. Although Hermans et al. (2017) have the merit to acknowledge the importance of tension for the self-system, they do not overcome the current approach in psychology that considers tension as a merely disruptive element or temporary condition that must be overcome.

Tension is instead an inherent condition of life, from molecules to living organisms (Ingber 2003; Stamenovic and Ingber 2009). It ensures the constant dialogicality between organism's integrity and development. In classical physics, tension results from an ongoing process of adaptation of a system to the changing conditions of the environment, under the form of vector of forces acting upon it provoking only two possible outcomes: deformation, understood as a metaphor of adaptation, or rupture, both raising the question of the organism's identity over time. The system is in equilibrium when no environmental forces are exerted upon it. The problem with this understanding of tension as perturbation of equilibrium is that change can be triggered and explained only in terms of external forces applied to the system, as in the case of Hermans et al. (2017), who conceptualize tension in terms of diverging directions of *I*-positions determined by external social forces. This assumption is for instance observable in the context of the public debate about large-scale migration phenomena: legitimate forms of migration are only those in which external forces have pushed people to move or escape from their condition or country (e.g. war, natural disasters, etc.). Refugees are more socially "acceptable" than economic migrants, who seem to be moved by a personal need for a better life, the latter have no legitimate reason for breaking "equilibrium" of society. Western (democratic) countries seems to account for border-crossing only under conditions of heteronomy, they do not accept self-determined and autonomous border violations!

The equilibrium model in psychology cannot thus account for endogenous development. In an explorative theoretical work, we have tried to conceptualize dynamic tension, rather than equilibrium, as the concept that can help to understand the semiotic construction of the Self (Tateo and Marsico 2013). The idea of tension as a constitutive element of systems originates in the design of

innovative architectural structures and developed into the concept of "tensegrity", a contraction for "tensional integrity" (Fuller 1961). Tension is not a disruptive force, rather every system is made of sub-parts that are in hierarchical relationships of continuous tension and discontinuous compression called "self-stress" (Fig. 6).

Fig. 6

Tensegrity in architecture, the United Kingdom's Pavilion at Expo 2015 in Milan, Italy, (photo by Marsico 2015)

AQ5

The complementarity between tension and compression elements (Fig. 7) is systemic feature, "unpredictable from the behaviour of the parts considered individually" (IUED 1978, p. 261).

Fig. 7

A simple self-stabilizing tensegrity network composed of three compression struts interconnected by a continuous series of tensed cables (Stamenovic and Ingber 2009, p. 1139)
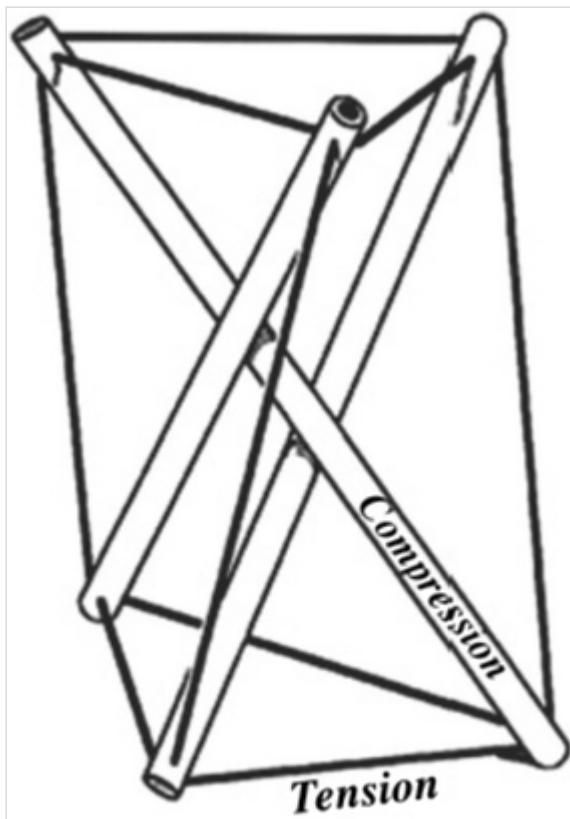
For instance:

> "Our bodies provide a familiar example of a prestressed tensegrity structure: our bones act like struts to resist the pull of tensile muscles, tendons and ligaments, and the shape stability (stiffness) of our bodies varies depending on the tone (prestress) in our muscles" (Ingber 2003, p. 1158).

Another example of tensegrity system is the living cells that control their integrity, shape and mechanics by a coordination between bordering and tensegrity (Fig. 8):

> "To structurally integrate thousands of different molecular components, and focus forces on these structures that alter their self assembly. Tensegrities self stabilize by imposing an internal tensional prestress that places the entire molecular framework in a state of isometric tension" (Stamenovic and Ingber 2009, p. 1138).

Fig. 8

Schematic representations of the tensegrity force balance of an entire spread cell with central nucleus and radially oriented microtubules (light gray lines) that oppose the inward-directed forces generated by the surrounding actomyosin

network (geodesic black lattice). In the square magnification it is possible to appreciate the fundamental processes taking place at the border of the cell's membrane (modified after Stamenovic and Ingber 2009, p. 1139)
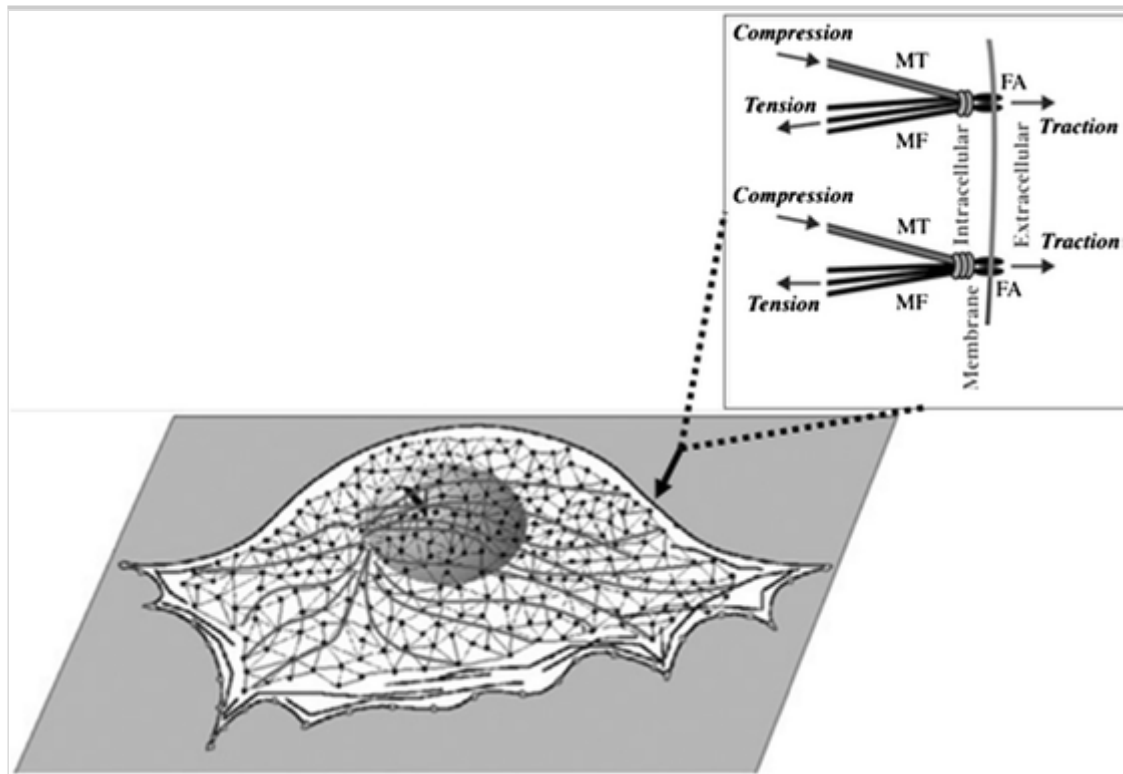
Besides, we can find tensegrity structural principles also in complex organizations (IUED 1978; Judge 1979). Any organization can be understood in terms of a wholeness of interrelated sub-parts (departments, committees, single individuals, etc.) which generate a flux of tensions (centripetal forces) and compressions (feeding into each other functions) requiring a systemic coordination to maintain the organization's integrity (Judge 1979). Every point of overlapping between two or more different sub-parts of the organization is at the same time a border and a connector, which creates an "arena" for "functions, communications and decision" (Judge 1979, p. 591).

In all the examples above, tensegrity and borders are present both as structural and functional features of the sub-parts, that specialize in functioning as modular sub-systems with their own tensegrity organization, to maintain the whole system's integrity and flexibility.

> "It is the unique equilibrium (made possible by a tensegrity pattern) between what unites (i.e. the tensional network) and what divides (i.e. the many distinct compressional incompatibilities) which gives rise to (and derives from) the new kind of organizational structure" (IUED 1978, p. 260).

Tensegrity in Psychology

As far as we know, the concept of tensegrity has not yet been developed in psychology. There are only few cases in the history of the discipline, long before the concept of tensegrity itself existed, in which scholars embarked on a similar kind of conceptual elaboration.

The first specimen is the idea of the stream of consciousness in relation to the identity of the Self of William James (Fig. 9).

Fig. 9

Illustration of the unity of consciousness (James 1950, p. 283)
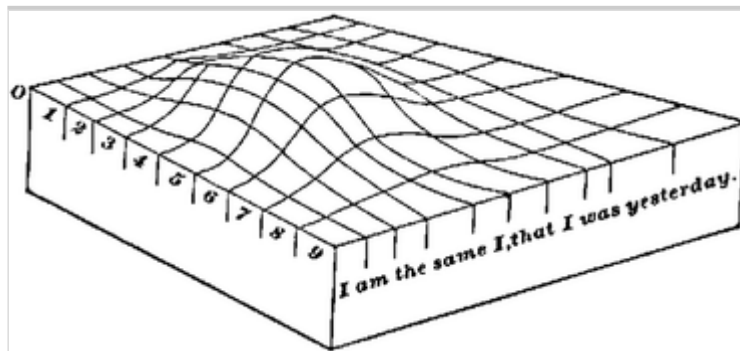
The original explanation of the figure is as follows:

> "Let it be the thought, 'I am the same I that I was yesterday.' If at the fourth moment of time we annihilate the thinker and examine how the last pulsation of his consciousness was made, we find that it was an awareness of the whole content with same most prominent, and the other parts of the thing known relatively less distinct. With each prolongation of the scheme in the time-direction, the summit of the curve of section would come further towards the end of the sentence. If we make a solid wooden frame with the sentence written on its front, and the time-scale on one of its sides, if we spread flatly a sheet of India rubber over its top, on which rectangular co-ordinates are painted, and slide a smooth ball under the rubber in the direction from 0 to 'yesterday,' the bulging of the membrane along this diagonal at successive moments will symbolize the changing of the thought's content in a way plain enough, after what has been said, to call for no more explanation. Or to express it in cerebral terms, it will show the relative intensities, at successive moments, of the several nerve processes to which the various parts of the thought-object correspond" (James 1950, p. 283).

James' stream metaphor includes continuous tension in the form of peaks and hollows. Change and continuity are conceptualized in terms of differences of potential ("relative intensities, at successive moments") within the stream of consciousness. The dynamic integrity of the self-system is thus depending on the constant tension between different potentials within the sub-parts of the systems.

The second example comes from Paul Klee, who tried to develop a new pictorial language based on the principles of Gestalt Psychology (Klee 1961). Klee developed a systematic study of the relationship between laws of perception, artistic language and dynamic forces of forms. He made a distinction between "form" as a still life and "gestalt" as a living being: "Gestalt is a manner of speaking a form with an undercurrent of living functions. A function made of functions, so to speak" (Klee 1961, p. 17). Contrarily to Gestalt experimental psychology, Klee does not describe how Gestalt laws organize the perceptive field, rather how the Gestalt progressively emerge from the pictorial signs. The organizing principle of perception and emergence of Gestalt is tension (Fig. 10).

Fig. 10

The development of Gestalt out of tension and movement (Klee 1961, p. 24)
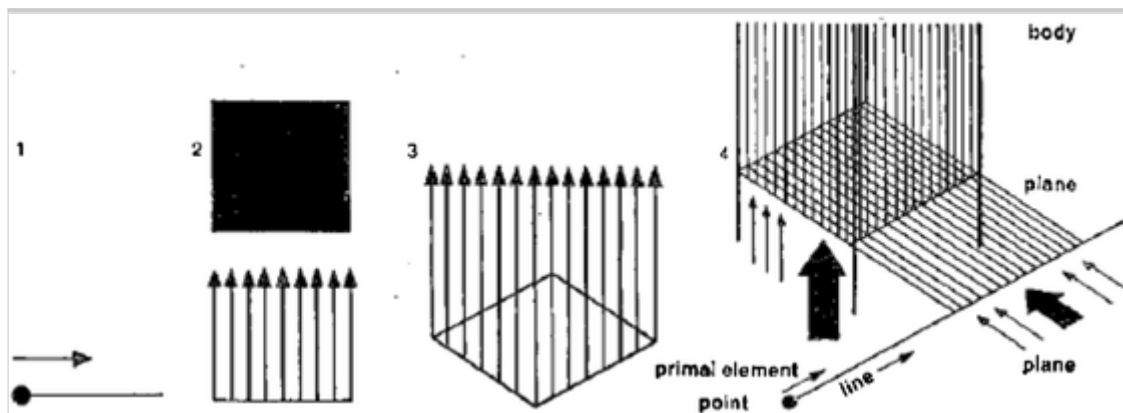
The point in itself is already a minimal portion of space (Fig. 10.1) that immediately calls for its complementary counterpart (see Fig. 3 above). This minimal distinction turns already the point into an "agent" (Klee 1961, p. 24) in motion and a line comes into being. Any further change of direction and dimension generates a new tension corresponding to new kinetic energy (Fig. 10.2 and Fig. 10.3). Figure 10.4 finally shows the "summary of the kinetic energies which move the point into a line, the line into a plane and the plane into a spatial dimension" (Klee 1961, p. 24). Klee shows the wide potential variety of tension, analyzing their psychological resonance in the observer (Fig. 11).

Fig. 11

The tensions underlying different forms (Klee 1961, p. 33)

A straining from all sides: exertion

Centripetal: Inward pull

The tension discharged, accomplished

Basic movement of domination

The centre as point of culmination. The intensified inner relations are directed towards the centre

Movements starting from one's own being can be enhanced by suggestions of counter-movement. Synthesis of movement and counter-movement

Centrifugal: Outward pull

The articulating energies and impulses illustrated by the example of a leaf (growth in several directions). Union of material tension and ideal tension (i.e. simultaneous presentation of essence and appearance).

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In the examples of Klee it is possible to see how tension is the driving force that leads both to the internal differentiation of the Gestalt and to its organizational integrity as a whole. The borders of the figure operate together with the field of forces, they generate and maintain the tension while at the same time they are generated and maintained by the tensions, like in the case of the cell's membrane (see Fig. 8 above).

Finally, the scholar who has elaborated the most interesting model in which tension, boundaries and structural integrity are dynamically related is Kurt Lewin (1936, 1939). His idea of person's development is based on the progressive elaboration of the life space through differentiation of sub-parts. The infant experiences a boundless life space, in which objects and persons are still somehow part of his own individuality. During development "the parts of his own body become differentiated from each other and from the rest of the world; social relations develop and become differentiated; needs, emotions, language go through a similar process of differentiation" (Lewin 1942, p. 226). The life space

of the individual progressively populates of meaningful objects, persons, boundaries (internal and external), values, needs that generate complex configurations of vectorial forces (Lewin 1935, 1936, 1939). "Like in the process of cellular division, the psychological space of the individual becomes more and more populated by meaningful objects and segmented by sets of internal and external barriers" (Tateo 2014b, p. 228). The inner sphere of the life space is surrounded by external barriers, as well as by internal barriers (either material or symbolic, physically coercive or internalized by the individual through customs or guilt). The internal regions of the field can be characterized by more or less "sharply determined boundaries of these regions" (Lewin 1997, p. 19, original italic). We propose to understand Lewin's life space as a kind of tensegrity system in which vector of forces represent tensors and compressors. Boundaries are part of the system and play a role in determining the psychological value of all the objects in life space, as well as the value of the objects beyond these barriers. Each sub-system within the life space represents a tensegrity system which can be interlinked with one or more sub-areas of the space.

Borders, Tensegrity and the Self

Despite this idea of the field of tensions as constitutive part of the Self has sometimes emerged, as we have seen in the cases of James, Klee, Lewin and today Hermans et al. (2017), it has not yet been theoretically explored. The concept, such as it has been used, implies tension *between*, while the idea we propose should account also for tension *within*. The idea of tensegrity is that tension is necessary (within some parameters) to the maintenance of the system itself as well as to its development. With the application of the co-genetic logic, we have claimed that the inherent tension of the Self is generated by the fact that experience emerges from the production of a distinction (a border) which immediately co-creates two complementary and opposite fields of meaning. This process is not to be understood as a temporary unbalance that must be overcome or recovered, rather as a continuous dynamic and dialogical movement between and within sub-parts of the system.

By applying the conceptual triad [borders, co-genetic and tensegrity] to the Dialogical Self Theory, we try to expand the understanding of the Self-system. We started this article by discussing the interesting development of the model proposed by Hermans et al. (2017) who refer to the metaphor of democratic society of the Self to understand the challenges and possible direction of adaptation that the persons can face in the contemporary globalizing society. Then, some of the intuitions present in that proposal have been expanded trough the notions of borders, cogenetic logic and tensegrity which introduce a wider

developmental and dynamic perspective in the Dialogical Self Theory. The "dialogue" between these notions within the cultural psychology framework describes the functional and structural mechanisms that make possible a renewed conceptualization of the Dialogical Self in a more dynamic fashion.

Let's take Hermans' metaphor of the self-system as a polyphonic social space populated by *I*-positions, the components that correspond to the person's perspectives, expressed by the internalized voices of the significant others (real or imaginary, human or non-human, individual or collective, etc.) (Hermans 2014). According to our hypothesis, any *I*-position emerges together with a border and something that we will call *non-I-position*. Non-I position is the logical negation of the *I*-position (whose limits are defined by the distinction) and is an open set, an infinite field of possibilities. Is exactly the existence of this open infinite set that allows for the unlimited emergence of new meanings and new *I*-positions that, in its turn, will open the field to a new emerging position, and so on (Fig. 12).

Fig. 12

Co-genetic logic vs. oppositional logic in the tensegrity Self
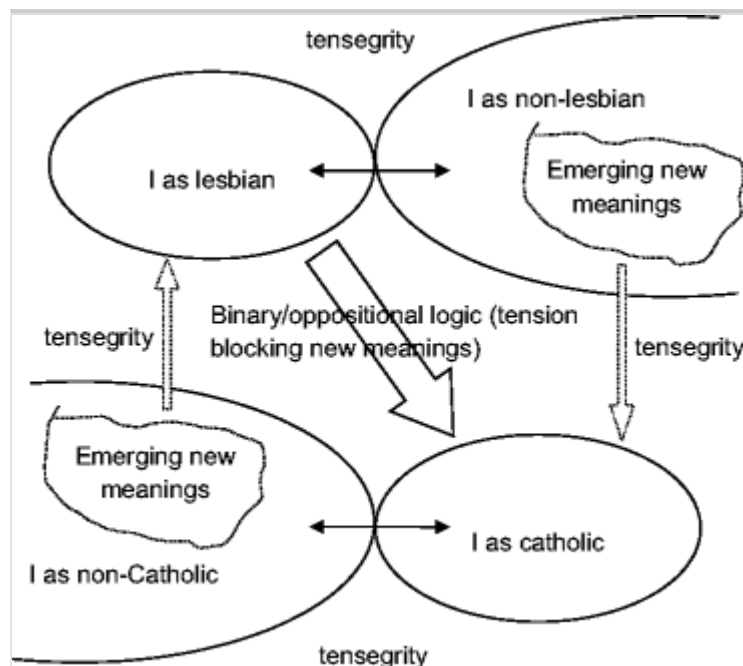
The definition of the properties of the *I*-position is possible only through the relationship with the "non-*I*-position". For instance, in the case of gendering (see Fig. 5) the *I*-position "I as X" (male, female, lesbian, etc.) emerges together with its complement "non-X" and with the border that can consist of some specific signs (e.g. ways of dressing, talking, acting, etc.) related to the cultural suggestion about gender features. Thus, "I as a lesbian" is co-defined through "I as non-lesbian" (including all the possible instances of the field of meaning

"non-lesbian"). This process is valid also at social level: we is defined through the other.

Once this triad is established [lesbian, non-lesbian, border signs] the tension will emerge altogether in the liminal zone for which the person has to dynamically negotiate which feature belongs to the different fields. The case of the lesbian young woman studied by Branco et al. (2008), and quoted in Hermans et al. (2017), can be reconsidered as a process of ongoing negotiation between those liminal elements that can fall or not within the fields of being "lesbian", being "Christian", etc. In other words, the dialogical tension is not only *between I*-positions – "I as a lesbian" and "I as a Catholic" – but also *within* the single *I*-position – in the dynamic process of negotiating what is ought to "I as a lesbian" and what is not. Depending on the conditions of this negotiation, the border between the *I*-position and the non-*I*-position can move, including or excluding some properties or conducts that were previously into the opposite field of meaning (see Fig. 4).

Hermans et al. (2017) are still bounded to an oppositional type of logic. What they actually present is a relationship between the self and the culture that is mirroring the common sense oppositions. According to the co-genetic principle, instead, we have a more complex system of relationships between different fields of meaning (Fig. 12).

It is exactly because the different meanings are in tension and at the same time interlinked that is possible the development of new and flexible configurations *according* to the cultural context, that promotes some acceptable compromises while inhibiting others. At the same time, this dialogicality between relation and tension ensures the integrity of the self-system over time *despite* the cultural context. The emergence of a third position or a meta-position (Hermans et al. 2017) is thus not a resolution of the tension, but a transformation of the field that reconfigures the tensegrity structure of the Self and feeds forward to a new dynamic tension. In fact, the meta-position will immediately evoke a border and a complementary position. This way of understanding the emergence of positions accounts for the developmental process by both endogenous and exogenous forces. Otherwise, a meta-position would represent a kind of settlement that would have no further reason to develop but an external change in the cultural context.

Conclusion: Developmental Tension

We have taken inspiration by the recent article of Hermans et al. (2017) about the democratic organization of the Self in a boundary crossing world to discuss

our theoretical elaboration of the concepts of borders, co-genetic logic and tensegrity. We have conceptualized the Self as a dynamic semiotic system in constant evolutive tension, rather than a system in equilibrium adapting to the environmental changing conditions. We have proposed to replace the concept of stability and continuity of the Self with the more fruitful idea of tensional integrity.

According to Hermans et al. (2017), the self-system reverberates the complex and polyphonic cultural tensions and the border-crossing processes that characterize contemporary western societies. In the first section of the article, we have argued that the ideology of globalization is only apparently promoting the pulling down of borders. Yet any process of border-crossing is also a process of border-making (Marsico and Varzi 2016). Indeed, we can see how in contemporary societies the establishment of a new border follows the overcoming of an old one. The multiplication of identities is complemented by the multiplication of bordering. In the second section we have provided a theoretical justification of this claim using the co-genetic logic of Herbst (1976). A developmental system can emerge only in the process of co-definition between a border, a field "A" and its complementary logic negation "non-A". When we talk about "we", producing a complex of signs that defines our identity features, immediately emerges a "non-we", *through* and *with* which we define ourselves in return. We attribute a different value to the fields, so "we" gets a more positive value than "non-we". The latter including all the infinite forms of "them", "not really-us", "similar to us", etc. that are at the same time potential candidates to migrate within the field of "we" as the border moves.

Hermans et al. (2017) attribute a relevant role to tension in the self-system. Yet, in line with the tradition of psychology, tension is understood as a divergent element between resonance with cultural trends. Aspects like race, gender and nationality representing fields of tension in the multicultural society reverberate in the self-system through opposing *I*-positions. Thus, tension is something that must be solved through the emergence of a negotiation between positions or a third meta-position. Otherwise, the outcome can be a maladaptive solution that jeopardizes the self-system. We have proposed a different perspective that can expand the understanding of tension in the development of Self. First, we have discussed some ideas in the history of psychology that have somehow anticipated this view. Then we have introduced the concept of tensegrity, imported from architecture and life sciences.

In our model, the triplet borders, co-genetic logic and tensegrity the tension becomes a developmental force and a feature of the Self-system. Tension is not something to overcome (as long as it is within acceptable parameters) but is a

constitutive element of psychological life itself allowing both development and integrity of the self-system. We finally suggest that this new look can help to expand and to enable Dialogical Self Theory to deal with the ambivalences and complexities of our contemporary and future existence as human beings.

Compliance with Ethical Standards

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Conflict of Interest Giuseppina Marsico declares that she has no conflict of interest. Luca Tateo declares that he has no conflict of interest.

Ethical Approval This article does not contain any studies with human participants performed by any of the authors.

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[1] In the context of this article, Border/Borders and Boundary/Boundaries are used as synonyms.