



Spiral and Helical Models for Psychology: Leaving Linearity Behind

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Abstract

We suggest that theoretical models in the social sciences would benefit from uses of nature's images that map the complexity of the phenomena to be investigated. Such abstractions would better maintain the open-systemic character of the psychological and social phenomena in all their complexities. Particularly central in such complexities are dynamic catalytic processes that are operating in wholistic fields of psychological systems such as self, identity, and values. Theoretical models taken from the mechanical realms of computational processes fail to capture these constantly changing and often nebulous fields. In particular, we analyze the promises of two abstract forms based on nature—spiral and helix—as providing temporal structure for understanding basic higher psychological functions, using the dialogical self theory as an example. The focus of that theory on dialogicality between I-positions in their transition through ruptures of the whole system is best fitted with nonlinear field-dependent models. For all systems of complex dynamic wholes kind, theoretical field models emulating various biocynotic systems (“meadow,” “mychorrea,” etc.) would constitute a new direction in theoretical advancement in the human sciences.

Keywords Spiral · Helix · Nonlinearity · Hyper generalized sign-field · Identity · I-positioning · Organic metaphors · Polysemic multivoice · Self-identification meadow

The unity of different forms in this Greek ornament fragment specifies the theoretical goals we have in this article—to consider different nonlinear models for our understanding of nature, mind, and society. Looking at the elementary fragment of the ornament above gives any viewer the visual understanding of the unity of two kinds of nonlinear dynamics—a continuously monotonic nonlinear progression between elements,¹ branching off regularly

¹ Interestingly, the branch uniting the spiral outgrowths that was characteristic of Ancient Greek and Roman ornaments disappeared in Byzantine versions of ornamenting practices. The psychological signifi-

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into spiral forms. How can an ornamenting practice known from long past in history innovate our theoretical thinking in the social sciences?

First of all, ornamenting practices emulate—and abstract from—nature. Nature is characterized by abundance of nonlinear forms. In contrast, human beings who build their worlds by conquering nature tend towards linearity in their buildings and in their minds. The latter penetrates the thinking of social scientists who attempt to make sense of society and mind in terms of linear models. In the twenty-first century, it becomes clear that understanding of science requires adequate general models that do not do disservice to the phenomena. Psychology's flirtation with the general linear model has led the discipline to the basic understanding of nonlinearity of the *psyche* (Toomela & Valsiner, 2010)—similarly to nature.

Secondly, social sciences are infested with a myriad of empirical research efforts, but what they need foremost is theoretical and metatheoretical creativity. We here detect the problem in a particular meta-theoretical location—axiomatic preference for assumption of inherent linearity that is superimposed onto abundantly rich and dynamic processes. We as human beings cannot ignore such gap in our knowledge, even when it is inevitable. The issue of change is always in our sight, giving us the feeling of being incomplete and hopeless in our efforts of impacting our future.

Human psychological processes are dynamically nonlinear (Puche, 2009) and are—as all *open systems*—organized via catalytic rather than causal principles (Cabell & Valsiner, 2014; Valsiner, 2019). Heterogeneity is everywhere. Today's society and every single individual living in it, is constantly evolving, “shifting forward,” growing and creating new connections. Change is an undeniable fact, that comes with being alive, but numerous questions to science remain unanswered: “How do we change?,” “Are we shifting straight forward or are we lost in a circular movement?,” and “How can we understand such a dynamic process?.” Human endless questioning of “the meaning of life” or “the individual purpose of our selves” feeds our scientific efforts forward. From our past until today and probably into the unknown future, we will have to struggle with those uncertainties. New ideas are accepted slowly as history of astronomy and geometry have shown.

From Circle to Ellipse: Celestial Geometry Re-considered

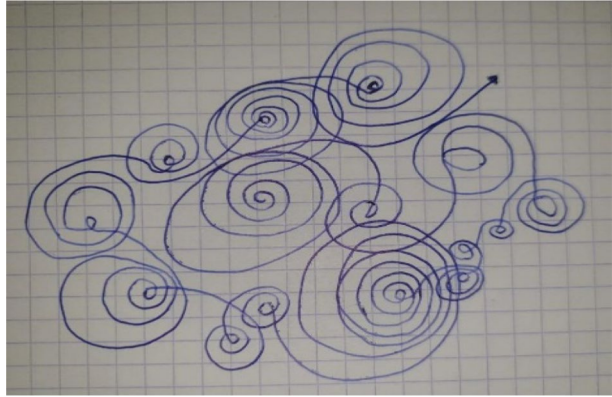
A circle may be an ideal nonlinear form in geometry, but as a model for real moving subjects it does not fit. The baseline of all forms—the line (Ingold, 2016)—can take many particular forms. No model can be generated and visualized without using the line as a tool. Yet, what particular forms the line would take is dependent upon what kind of meanings it carries. Timelines, forces, and axes are only some of the occasions where the line finds its way into our understanding.

At the first sight, turning the forward flow of time into an abstraction as a line is totally normal, even natural the time is leading us into the unknown future while illustrating our constant growth and evolution, but this thinking pattern is already contaminated. We gave time and the knowledge related to the time axis a meaning. A line entails always a notion

Footnote 1 (continued)

cance of such ever-present patterns indicates the curvilinear nature of human internal affective processes (Valsiner, 2018).

Fig. 1 Habitual drawing of lines: nonlinearity in expression



of the linearity that at any moment could turn into curvilinearity. The potential of lines lies by the possibility, in what it can be transformed into curves. Our human habitual drawing habit—doodling—shows such tendency (Fig. 1). The drawing hand deviates from linear drawing and ends up in a sequence of spiral-like ornamenting designs.

The circle is one of the first possibilities that occur when we think about forms that are used in science to depict the natural world. Yet, the circle becomes broken in the human mind. This breaking has several meanings, but a more famous one re-findable in every community of the world is the meaning of infinity and completeness. It is often used in psychology, for example as a symbol of a closed circle, that inhabits the repetitive of a process and connects all the important steps of the process. In generalized construction again, but this time it shows different weaknesses as those hidden in the form of the line. Yet, it is ellipses that come closest to planetary reality. This visual explanation can be explained by an example of Johannes Kepler's role in his classic work on planetary orbits (Kepler first version appeared in 1602; Fig. 2). The "New Astronomy" can be described as one of humanity's most important steps to a scientific understanding—demonstrating

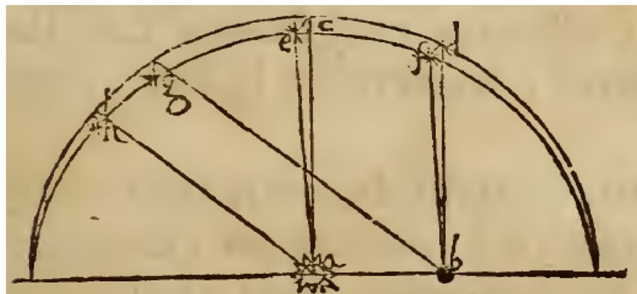
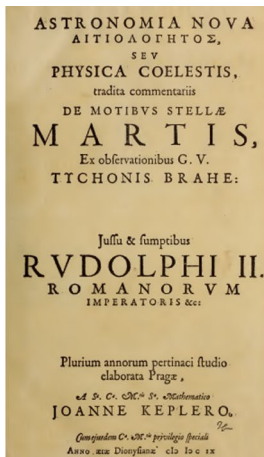


Fig. 2 *Astronomia Nova* by Johannes Kepler and the arrival at the idea of the elliptic orbit of Mars

the elliptical nature of the planetary orbits (Fleckenstein, 1975). Kepler's laws of planetary motion. Kepler changed the humans' understanding toward the universe by creating three laws, whereby the first law pointed out that the planets of our solar system were moving in ellipses, with the sun at one focus (Wilson, 2000, p.83).

The completed circle symbolizes that there are no forces—lines outside impacting it in its completeness. This problem disappears while using the construction of ellipses, inhabiting the invisible force holding it at a supposed path. For simpler processes, modelling these by ellipses is a very useful tool, which does not deny other forces and underlines a repetitive notion. Nevertheless, it is again unusable for the dynamic processes that can take new form in the time—obviously planets or comets do not provide astronomers by surprise of deviating from their orbits.

The move from circle to ellipse in theoretical models allows for consideration of implied forces regulating the celestial orbits. Elliptical models allow for repetitive movements, but it denies the change that is connected with transformation into a new form—A simple example of why the ellipse has a stagnating nature is re-findable in the concept of “Nihilismus.” If the human evolution in time, for example, would be connected to a closed circular movement, it would mean that the humankind could not change beyond the current situation and is destined to return to the precious state. Using models of circular or elliptic kinds, humanity would lose its drive by the belief that it is not important what they are fighting towards, because in the end, it would always be similar to a time that already existed before. For evolutionary processes that include all biological, psychological, and social systems, such assumption of repetitive continuity is not adequate. This leads to the crucial question—what kinds of abstract models would fit the developmental phenomena.

The Metaphor Model Theory: What Kinds of Analogies?

Different implicit abstract models are in the very foundation of any science. The usual axiomatic model is linear, while the complex phenomena of biology, the *psyche*, and society point to the adequacy of nonlinearity as a feasible starting point. Here, we go beyond the elliptic models and emphasize the spiral—and its 3-dimensional form, the helix—as a form that unites different sciences, from genetics to sociology. Besides building abstract models, we will use phenomenological examples related as well toward the spirals or spiral-like behavior to imply the multidimensionality of the theory's meaning and the potential we can gain from these representations.

The psychological field as every scientific field is always changing and growing through the new individuals, called researchers, who enter it. It could be seen as a fact that for example, the knowledge based on quantitative statistics is only able to define knowledge only at the time when it was generated as it assumes ontological stability. Research is naturally seen restricted by its *realisators*, the researcher, which means that to understand knowledge we have to form knowledge into something we can retrace and use as a tool. Linearity is such tool that allows us to simplify knowledge and to become able to explain to common public. Nevertheless, when most human beings follow only known paths we cannot find out if there is no further potential we can use, as the use of metaphors, where already generated knowledge is connected with new knowledge (describable as the use of “common sense” knowledge as a foundation for new understandings). In conclusion, this underlines the importance of the metaphor's meadow as a new tool of knowledge generation that could help us all to improve the knowledge generation for science and the humankind.

While gaining knowledge in forms of models and theories, we should never forget that all this knowledge has to be representative of the rich phenomena and also be understandable for us as human beings. It is necessary, especially for psychology to consider those issues. The legacy of the psychology the twentieth century of attaching numbers to complex psychological phenomena is poisoning our minds. Through that act—often declared to be the epitome of “being scientific”—we are losing the basic human phenomenological realities from the scope of science (Michell, 1999) In the relation of *Naturwissenschaften* with psychology as a *Geisteswissenschaft* in its complex whole, are bonded with each other and should not stagnate in an endless questioning of each other’s worth—a point made over a century ago by Wilhelm Windelband (Lamiell, 1998). As in Wilhelm Kamlah’s definition of the concept “*Neuzeitliche Wissenschaften*,” a concept was created that could be able to connect the current layers of sciences with each other’s. In the sense of modern scientific research, several psychological used terms seem to be outdated, as in our paper the term “nature.” In Kamlah’s opinion, scientific research is formed in physic and chemistry, as a methodically clarified combination of mathematical theory and technical understanding (Mittelstraß, 2016). Based on these understandings, nature should not be restricted to the shallow experiences and interpretations of our life on the earth, excluded from its deeper meaning and the forces driving us. Nature is, in general, the physical, material world or universe which is that of living organisms. In conclusion we compare the principle meanings between the nature definition definable as “*die blühende Natur*²” versus the construct of “*die unbelebte Natur*³”. In the following paragraphs we will follow nature in the meaning of “*Neuzeitliche Wissenschaften*,” in which nature is focusing on all the dimensions of nature from the smallest molecules to the infinite outer space.

Beyond the Ellipse—the Spiral

A *spiral* is a pattern, abundant in nature. In general, we see this form as it is described in mathematics, the spiral is a curved line, which starts from a point and moves endlessly further away, while it revolves around the starting point.

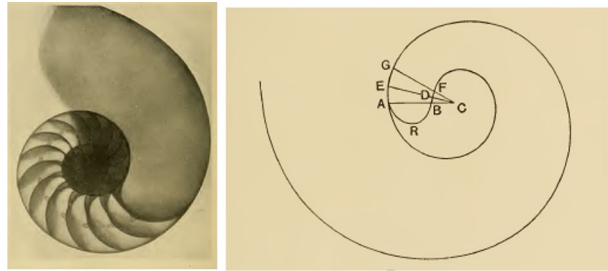
1. A spiral is a 2-dimensional curve that turns around a fixed core point, in a continuous movement of increasing or decreasing, into the distance from the core.
2. A helix, a three-dimensional spiral, is curving around a defined axis at a constant or continuously varying distance while staying parallel toward the axis.

The definition of spirals and helix, including the three dimensionalities, describes spirals as restricted toward a form/environment, for example, volute spring, whereby the form when for example water is draining in a sink is either described as a spiral or as a conical helix (Harcourt, 2019). For our purpose, the “helix” or “spiral,” will be freed from the expectation that, when applied, a successive spiral “loops” will save, or have, or keep—to the same diameter. Study of spirals in nature is a topic that seems to be in a historical perspective unavoidable. As Jan Swammerdam (1637–1680) recognized that a common mathematical characteristic can be found in a wide range

² “*Bliühende Natur*” describable as plants, animals, waters, and rocks. Which means all-natural complex that is part of the earth’s surface.

³ “*Unbelebte Natur*” definable as everything, from physical and chemical forces to biological organism, that exists or develops in organic and inorganic phenomena without human intervention.

Fig. 3 From the image of *Nautilus pompilius* to the abstract logarithmic model of the spiral (Thompson, 1917, p. 494 and p. 501)



of shells from *helix* to spirals, whereby D'Arcy Wentworth Thompson, (1860–1948) was going even further in his book *On Growth and Form*, where he gave an extensive treatment to these spirals and described the concept of shells through the subjective understanding as a mathematician. In general, he was describing the way shells rotate in close curves around a fixed axis, whereby in some shells as in *Nautilus* and ammonites, the generating curve revolves in a three-dimensional-shape, that can be followed in an ordered oblique path. The form that connects both the ability to see change, while underlining the networking between what happened and what is happening in the dynamically changing phenomena, is the spiral (Fig. 3).

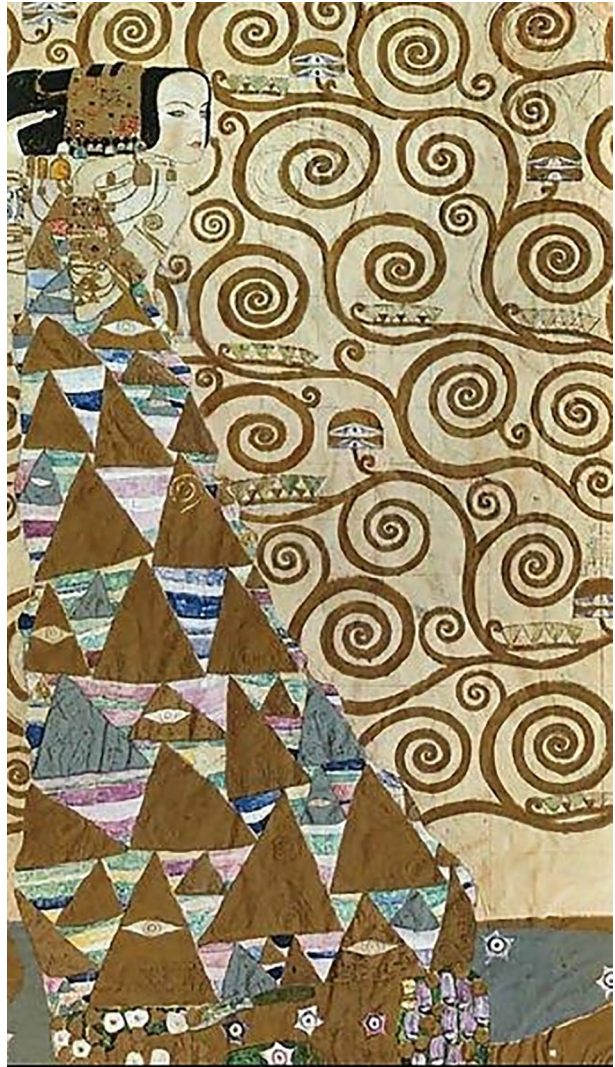
As a possible theoretical model, the spiral is still obstructed by the two-dimensional nature of its depiction. Nevertheless, it can connect the potential that goes beyond the line and the ellipse. While looking into history, the spiral-like form can be found even into the time around 10,000 BCE, which have been found on a decorative object in Mezine, Ukraine (Campbell, 2002). For this paper, we will only jump on some smaller examples of where we find the spiral in the social construction of history. For example in religion and art, we can find the triple spiral motif, a symbol in Europe for example (=e.g.) in Megalithic Temples of Malta. It is as well a Celtic symbol, in fact even a pre-Celtic symbol. It is carved into the rock of a stone near the main entrance of a prehistoric place called Newgrange monument in *Meath*, Ireland (Harvey, 2003). The spiral, in its diverse form, is at this time an emblem that can be found everywhere, from warriors' shields to decorative tools, like on Greek pottery.

It is crucial to take into consideration that in this paper, we are not focusing on a linear spiral, but on a less restricted version that inhabits a nonlinear change. In Theodor Lipps book "*Grundlegung der Ästhetik*" (1903), the spiral is shown in multiple versions as it has found its place as one of the forms present in architecture. Yet, there is a difference of architecture of places and the structure of the interval mind. For example, if we look at the development of identity, the latter cannot be pushed into one specific order of change, by its past, and it is not forced by its first motions into a specified direction.

In the twentieth century, the Western society expresses the spiral in many (today) famous artworks. Some of the most famous painters of European culture, could not avoid giving the spirals an own meaning, that catches the "Einfühlung" of its everyday observers. Examples of such artistic impressions can be found in Van Gogh's *Night sky* or the Gustav Klimt's *Expectation* (Figs. 4 and 5).

Even in the current, so very young, globalized artwork the spiral re-finds its connecting point over the world. The spiral is for example a central theme in the anime *Gurren Lagann* (Cavallaro, 2015), where it represents a philosophy, their way of life that defines the characters way of creating meaning for themselves. We can recapitulate that from ornaments discovered in archaeological investigations to the making of new mythological

Fig. 4 *Expectation*, by Gustav Klimt (1905–09)



figures human beings have been using the graphic images of spirals, but “What is making spirals so special as models of the world?”.

We have a look at the spiral from a different, a younger way. For this purpose last needed theoretical fragment is based on a question that accrues probably while reading this paper, “*What are the reasons, justifying the proclamation that a model based on the notions of nonlinear spirals and helices is needed in psychology?*”. This question will be answered while extracting crucial knowledge from the mathematical field into psychology. The Discovery of the non-Euclidean geometry can be connected with the publishing of the treatises on hyperbolic geometry, based on negating the parallel postulate, from the mathematician Nikolai Ivanovich Lobachevsky (1829–1830) (Taioli et al., 2016). Based on this knowledge, Bernhard Riemann founded, in 1854, the field of Riemannian geometry (1854), where he constructed a formula for a family of Riemannian metrics on the unit

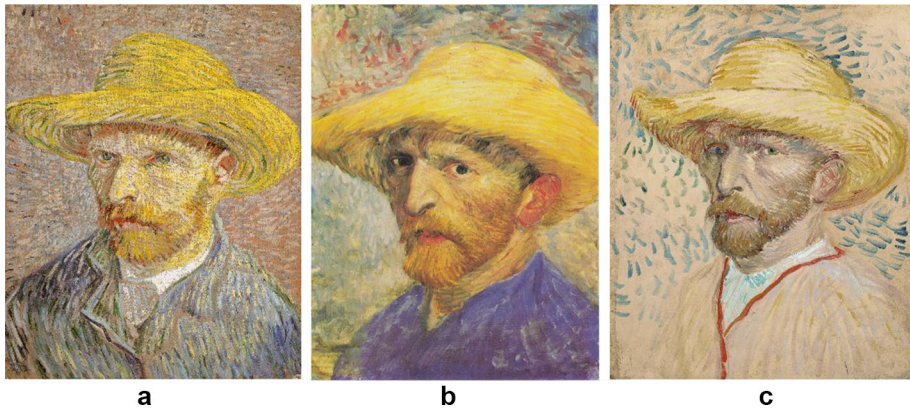


Fig. 5 a–c *Self Portrait(s) with Straw Hat, Summer 1887* (catalogue numbers: F469, F526, F365v)

ball in Euclidean space, which allowed an infinite family of non-Euclidean geometries. The simplest of these form groups is the elliptic geometry, due to its lacking on parallel lines (Taioli et al., 2016). The importance of the theoretical elaboration in the formulation of the geometry, which allowed non-Euclidean geometry to apply into higher dimensions, can axiomatically be described in several ways. In general, the parallel postulate, since its compound statement, *must* be replaced by its negation. “Parallel lines cannot meet”—a statant in Euclidean geometry—is negated in the Riemannian generalized geometry of spheres. To construct the idea— ‘there exists one and only one’ —can be negated in two possible ways. To obtain a consistent set of axioms that includes the axiom (having no parallel lines), other axioms had to be modified. These adjustments were depending on how the axiom’s system was used. These modifications affected the Euclid’s second postulate on such a form that the “line segments can be extended indefinitely” was transformed into the statement “lines are unbounded (Acerbi, 2013).”

The creation of non-Euclidean geometry was a major scientific revolution, which impacted the scientific way of how they see their subjects. Lobachevsky revolutionary work impacted many domains of sciences, whereby it also obtained a piece of crucial advice for the psychological research (Popov & Iacob, 2014). It included the linear geometry of Euclid into a larger conceptual framework—lines became parts of circles and circles—those of spheres.

Spiral and Helical Models in Sciences: What Can Psychology Learn?

The spiral-helical nature of the basic genetic organization is known since the 1950s, but its penetration into human sciences has been slow or nonexistent. This process can be described as the changing act of the meaning-making behind a historically linked symbol into a psychological necessary model, helping to catch up the complex construct of seeing time and evolving in the self, while simplifying the comprehending process for the research field. Furthermore, it allows us to share knowledge in a way that is understandable for outsiders as well as for insiders of the academic isolated world, by psychological jargon. The renewed opportunity for psychology involves the development of such model and educating society by sharing understandable and reachable yet not trivially everyday-kind knowledge for everybody, which can be reflected by every individual human being

(Lewin, 1930–1931). It is an effort to bring a new version of Lewin’s “Galilieian thought” to psychology that recognizes the substantive variability of the human psychological functions. Such variability comes in different forms—among which the spiral has been present in very many versions. In general, our world is filled with spirals, it is a symbol we all know and which inherits so much potential for psychology, that it needs its way into the field, where it can help us understanding and simplifying the process of understanding everyday life meaning-making process. “Why does psychology need the spiral?” and “where can it be used?” are the targets of our article.

Can psychology learn from nature? Is a pattern of the structure of sunflowers leading us to productive generalizations (Vogel, 1979)? The special connections of nature and mathematics can be found hereby in the angle 137.5° which is also called the Golden Angle, related to the golden ratio (Dunlap, 1997), often related to Picasso’s Mona Lisa. Spirals in the organic environment are frequently observable, whereby they are known either as whorls. The frequency appears even more understandable when we look at the top of our fingers because what we find on them are the fingerprints, which are as well shaped like a spiral.

Nonlinearity in the Self: Spiralling Multivocality

In psychology, all statements about the self are made by signs presenting some features of the *psyche*. Signs are part of an individual’s reality, whereby it depends on the self to evaluate a sign as strong enough to impact the dynamic process of the person-environment network. Hubert Hermans’ dialogical self theory is the innovative look on the self that has been advanced since the early 1990s—its basic terms include (a) I-position, (b) voices that create the I-positions, and (c) maps of I-positions.

Starting with the (a) I-position, understandable as a hierarchical chosen self-positioning that the “self” uses as a networking medium/tool to dialogue its own desires, goals, and meaning toward its environment. By defining the own priorities and ordering them in a nonpermanent hierarchical construct, the self can define an integrative solution that allows taking care of the prioritized environmental-self related needs. These I-positions are retractable toward an initialization/generation point the dialogue between environment and self. This means that the I-position is initialized from a voice but can also grow back into a (b) voice, when “needed.” The voice that creates the I-position has narrative and dialogical elements which allow them to impact into the self-reflection of the self and the dialogue between self and environment. The message that becomes the voice is resulting through the self’s dialogue with the environment and invites the self to be confronted, classify the meaning and reconstruct through it the own meaning-making, with the content of the message (Hermans, 2001; Nir, 2012).

Based on this main understanding we will locate the I-positioning in a map, if we take in consideration that every I-positions can impact the self’s meaning-making process and own positioning it seems necessary to elaborate a field, where these I-positions can grow and can (or can be) influence the current self. This field where I-positions can be generated, can grow or can fade away is definable as the (c) hyper-generalized sign field. The process of giving meaning is impacted/impacting (by) the self, confronted with a current situation. At this moment, the individual has to generalize the signs of its environment and of itself based on the information, from the voices, the individual could collect, whereby the current-self creates field/clusters, based on its current-positioning, that it can “relay” on in the potential-future. Every *I-position* works in such hyper-generalized sign fields that

impact the organization of the inner core of the self. In conclusion, it is impacting the self's sight when choosing the potential, but still uncertain, future.

As the next step, three of our subjective understandings have to be elaborated, which are the *self*, the *identity*, and its *hierarchical* nature. If we think about our "self," it seems natural to describe it as if *what we are* and what inhabits our identity, the way we express our self's to others. This is a naturalized misunderstanding that blocks us in the way of elaborating us as individuals, by forcing our dynamic "identities" to stagnate.

In contrast, the *self* has not to be seen as a "thing" but as a *frame*, which catches our current constructed meaning-making process in the now while preparing new changes, connections, and reconnections in its whole. The *self* is in that moment only a fragment of something bigger than the individual creates over one's lifetime. This means when the *self* is only the current frame, we see in the now and that visualized the current process of "dialoguing"-with its environment, that there must be something that covers the self and that could impact the process of dialogue, between self and environment. This "something" can be considered *identity*.

Before constructing the concept of identity, we need to elaborate shortly the construct of hierarchies, which roots in the identity field and can be seen as the process that allows the change in the meaning-making process of the "self." In general, hierarchies are connected with the meaning-making process; depending on the temporary decided hierarchical construction, the self allows a stronger bonding, priorities, one impulse over another. As the identity also the hierarchical order is dynamic and can change at any moment. This means depending on how the self sees a situation, dialogue with the environment, it can impact "how the self will see the environment and itself" (Campill & Fircks in preparation).

Based on these concepts, the identity has to be a dynamic construct that inhabits the self and can (not has to) influence as a catalyst the way of how the self-environment dialogue will be performed. The identity is a dynamic process that changes over time and that is constructed on the purpose of allowing the self to be prepared for any, subjectively seen, possible situation. That means the identity has to be seen as a concept that is bigger than the self because all the information of what-could be would overload the thinking pattern of an individual's self. On one hand, the identity is the result of the environment-self dialogue, definable as the self-identification process. On the other hand, identity is a field in which the self moves around. This field impacts the way of how the self connects with its environment and how it sees, project itself in the own past, from the subjective perspective of the current self, or future, the could-be (Campill, 2021). An illustrative example connecting the previous points and that helps to understand the meaning-making process of an individual, as a dynamic, always changing process, can be found in Van Gogh's self-portraits, that he painted over his lifetime. The unique illustrative material was created, while he focused on how he sees himself in the current now and not on the desire of being anatomical correct (Heinich, 1997).

At this moment Van Gogh was able to catch his self-positioned in his identity by using his current hierarchical order of the meaning he made until that specified moment. The pictures are always slightly different in colors and forms, like a homunculus of his self. Describable as a meadow in the four seasons, the weather seems to change in a circular rotation between each of them, in a determinate order. While looking closer we see that the meadow itself is not the same as the one it was a year before. Flowers, trees, they all changed slightly and created something look-alike its past. The same can be seen in Van Gogh's works, his emotions that impacted him in his way to see himself are as those seasons, whereby the paintings framed a similar picture, filled with newly constructed emotions that were build up in him by the dynamic change of his self and his environment.

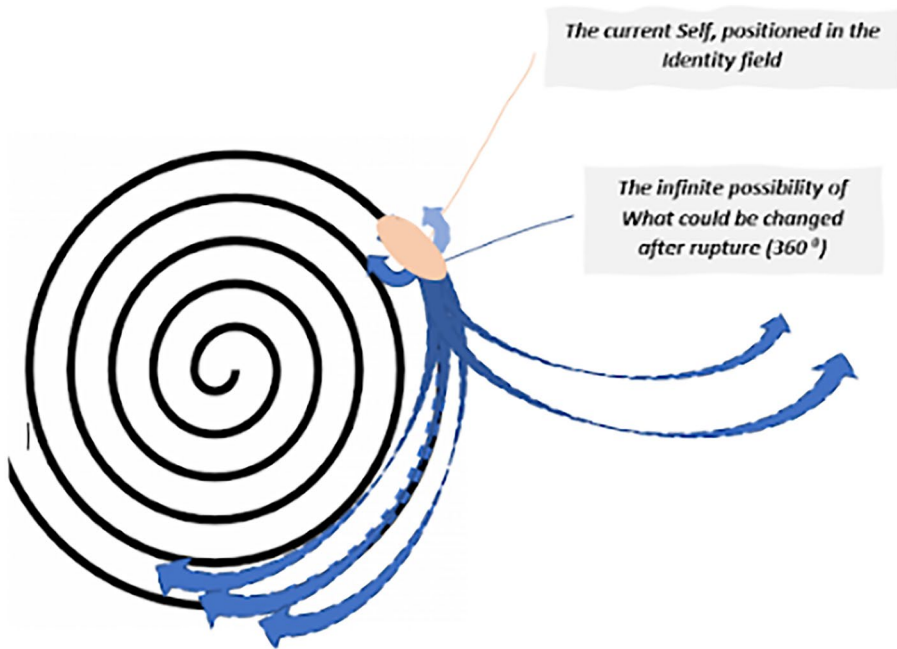


Fig. 6 The movement of the current self

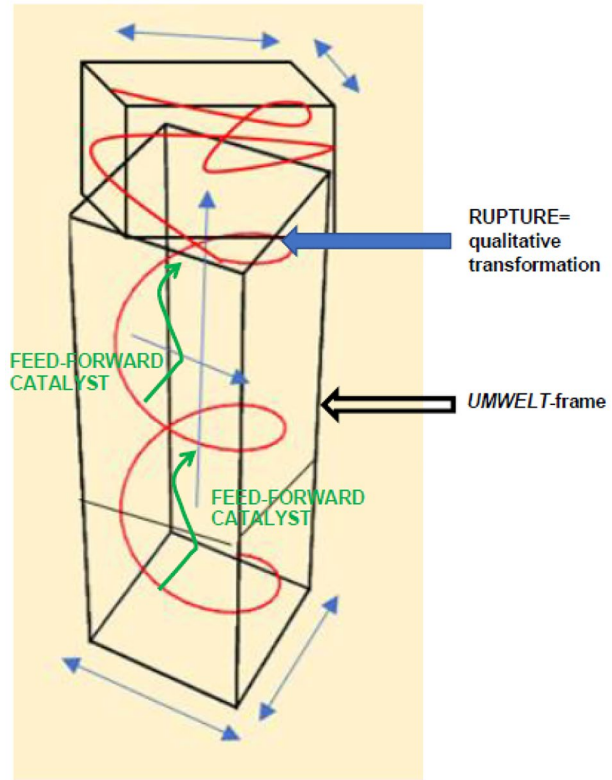
This means the spirals role is to visualize the construction of meaning-making, of the self in his field like identity, by binding it on the notion of times (Fig. 6).

As Fig. 6 shows, the spiral origins from a starting point and moves from that point further away, whereby it seems to connect with its past and potential future. In terms of Hermans' maps of I-positions, the spiral image brings personal history to the relations between I-positions. My today's I-position "I-as-MYSELF" can be seen to clash with both my contemporary "I-as-YOUNG ADULT"—both on the same location of the spiral (yellow zone in Fig. 6) as well as with my previous I-position "I-as-CHILD" from the previous turn of the spiral.

The dialogical self is a progressing field of I-positions. It undergoes periods of radical transformations—ruptures (Zittoun, 2006)—that lead to a new structure of the self. In any situation in the time frame, a rupture is leading toward another one. This means in any situation of the spiral the self was able to give meaning toward the situation and feeds forward new catalytic meanings to the future close contacts with the next turns in the spiral (Fig. 7).

Ruptures—in inner self (basic affective drastic changes of identity) or in social ritual (adolescent initiation rituals in a society) are the vehicles of self-development. By deepening our knowledge of self processes through the concept of rupture, the importance of the complexity of the self will become clear. The rupture in its strongest impact can be alternatively be called *Gestalts explosion*, which means that the current essence of the Gestalt, in this situation the self is collapsed and has to be reconstructed in a new whole. In every moment of our life, we experience such ruptures, whereby its impact in the self is the main difference that can be observed. In every moment of the spiral, there is a rupture that allows the meaning-making process or the self-identification process to change its direction

Fig. 7 Helical movement forward of the dialogical self



(Fig. 7). It only depends on how much meaning the individual give this rupture and in how the rupture impacted the hierarchical order that constructed the field in its current form (Bisgaard et al. forthcoming).

Example from the Japanese Shintoism: *Musubi*

The understanding of the complex field of the self as a process can be found already in the early phases of Japanese Shintoism. The understanding of *musubi*—braiding ribbons— involves creating wholistic unity. In this Shinto belief, the process of everything is bonded with each other and the way we live our life's bases on the way ribbons are braided (Fujisawa, 1959). *Musubi* results to being social while being alone, while eating or while sleeping. We can connect the strings, resolve them, and reconnect them. While looking closer to a traditional ribbon, we see different spirals that move on their own ways, whereby all the strings are connected. This means that such a spiral-like understanding of our self in time seems to have existed already in our past, but that this knowledge was forgotten over time by separating and hiding knowledge in boxes.

For the Occidental eyes, Fig. 8 seems probably first very irritating. Yet, what we see here follows the simple rule that the current self's spiral-like movement is free in changing its direction and movement in any moment, rupture, of its everyday life, then the movement becomes more understandable and ordered than first thought. In this painting, we see *Kodama Yōkai*, what can be translated as tree spirits. It has a very strong link to *Musubi*



Fig. 8 Kodama, painted by *Toriyama Sekien*, out of the first volume of *Gazu Hyakki Yagyō*, called “Yin”

and therefore to the construct of our meaning-making. These *Yōkai* are what bonds the natural dimensions of the tree with the meta-dimension of human “believes.” A connection with nature, by believing in the Kodama. By passing the tree in the everyday life and by giving the trees a history, a myth of past and future that interact with us and with our current self. How to respect nature and how our behavior can lead us into a possible future is what we can find behind these behaviors. Visually, we can also find *musubi* in the path of the painting, like a string it connects the Kodama with the trees, whereby it does not implement that they have to stay in the tree, it only symbolize the bond between Kodama and trees that once existed.(see Fig. 9)

Moving into Ruptures: Approaching “Attractor States”

Human beings anticipate their futures and attempt to proactively deal with the current states of disequilibrium. The latter take the form of “attractor states” (the key term in dynamic systems theory). These are states that—like “black holes” in the cosmological world—“attract” the human self towards its glory or other benefits (Valsiner, 2005). Their “attraction” is “fatal”—the nonhuman dynamic systems are drawn to them and cannot escape. The historical dynamics of “attractors” by themselves undergoes dynamics—from ascent to steady state to decline. The Japanese mathematician Tsuda described an “attractor ruin” as a destabilized “generalized attractor” (Tsuda, 2001).

The meaning of *attractor ruin* is productive for specifying the locations where the dynamic process is ready for innovation—it is either the ascent or decline (“ruin”) where new development can take place. Human self-construction processes entail more than mere “becoming attracted” and “pulled into” the power field of one or another “attractor.” We

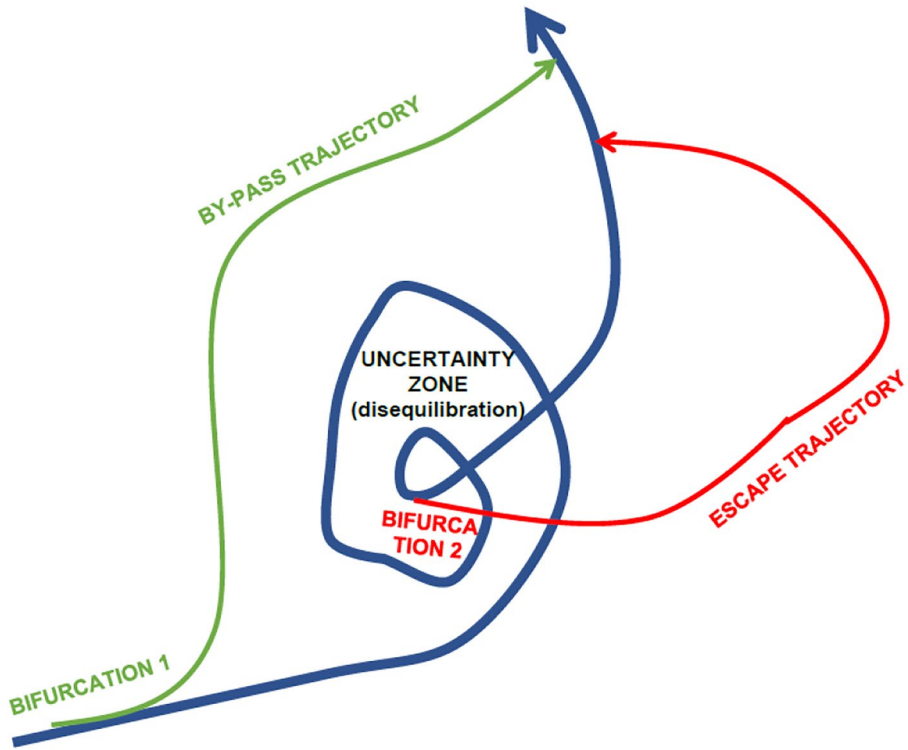


Fig. 9 The spiral nature of attractor and human ways of relating to it (Valsiner, 2020)

create our future “attractors,” give them meanings, and move towards them in our human lives with both anticipatory and adaptational orientations (Fig. 9). This encounter entails two bifurcations—that of possible avoidance (bifurcation 1) and that of escape (bifurcation 2).

The circulation of the spiral inhabits the movement apart from the starting point, whereby the theoretical movement is always partly impacted, gravitate, by its core so that while we are in our identification and meaning-making process. In conclusion, we are impacted by the gravitation of our current redefined past while we are attracted from the potential future that results out of the projection through our current meaning-making field—that can be characterized as an abstract meadow (Campill, 2021) or in other terms of nature-based organic metaphors.

New Class of Abstract Models: Organic Wholes

Theoretical psychology needs a way to understand the process of the self as it is communicating with the environment through the field like a dimension of identity in a form that simplifies the whole *Einführung* in relating to the field—preventing a cut-out of knowledge from the whole (Rayner, 2017). Kurt Lewin’s idea of a field theory (Deutsch, 1954; Lewin, 1936) emphasizes the importance of seeing every situation impacted through its multitude of vectors—to capture the dynamics of the fields. It is appropriate to describe

it as a methodological approach that allows creating scientific concepts that fit the totality of the field and to analyses causal relations in clear linking with the topology of the field.

A process that approaches the “nature” of the conditions of change, Lewin’s understanding of psychology, as well as his step toward a more holistic field theory, included mechanistic approaches, that could not handle the dynamic connection in our everyday life. His depictions of the field and vectors in the field were analytic givens—not representations of the abstract dynamic processes (e.g., the dynamic move of oppositely focused vectors into a dialectical opposition where the opposites became close and formed a tension. Vectors for Lewin could change direction, but not *grow into* such change as organic structures would.

An organic *metaphors-based* theory would allow us to reconnect Lewin’s ideas with the embryology like field that can overcome the understanding of structure a static and see it in its natural growth (Belousov, 1998). Such a new class of metaphoric models allows to deepen our understanding of a dynamic network between self and environment. The models involve free connections between *Naturwissenschaften*, art and mathematics with psychology would open new directions for abstract modelling. Efforts in this tradition already exist, for instance, the “mycorrhiza” (Engeström, 2006) or the “identification meadow” (Campill, 2021). The meadow is made to symbolize the self as a current fragment of a multivoiced concept, integrating and modifying constantly the connections by the illustrative example of a meadow abundant with voices in the form of flowers and trees. In conclusion, the meadow tries to inhale the multi-faceted whole that can be observed through the retaining form of different cultural backgrounds, while allowing the self-merging into the larger canvas (Campill and Fircks in preparation).

The Sign Field of Identity: Polysemic Multivoice

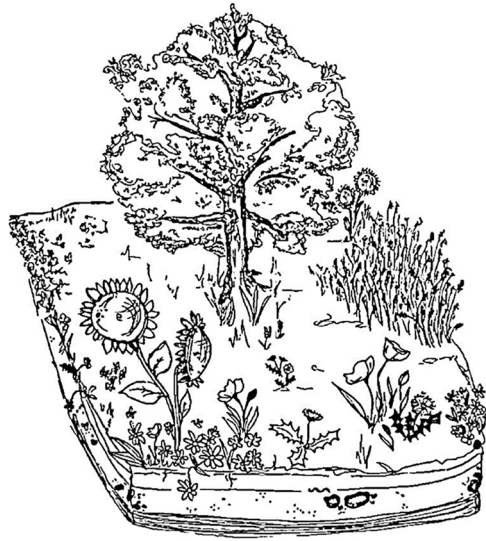
Human beings are constantly creating hyper-generalized sign fields for an intuitively guiding of our feelings into his/her environment. The hyper-generalized sign field is not following one dialogue, but it is built on simultaneous presence of multiple dialogues with different voices involved. We call it the polysemic multivoice (PMV). Most of our complex feelings are of the kind of PMV.

Scene 1:

Minori likes his social live (school, friends, sport, etc.), but he also likes to be there for his family. Sometimes Minori’s friends want to go out. Such moments are stressful for Minori, because he has his training times, his household obligations that force him to reorganise his schedule. At such moments Minori has several duties, voices, that are overlapping with each other’s. For example Minori wants to go out with his friends, he wants to help his younger sister to learn for her exams, he has promised his trainer to rest so that he is fit for tomorrows training and there is also this new special edition he would like to get. In this moment Minori has to make a decision, based on all the positions that inhabits him in this moment.

This diversity of voices that inter-communicates within the current self, through the hyper-generalized sign field is here revealed in all of its complexity. The abstracted notion of the meadow is model that allows following a process by using the social meaning-making behind how we see nature, it could be describable as a “mind palace” construct, where visualization and knowledge are connected in the own meaning-making process. In this situation, the self-identification meadow can be conceptualized as the PMS, in which

Fig. 10 The meadow as a model of the self (drawing by Sarah Campill, reproduced by permission)

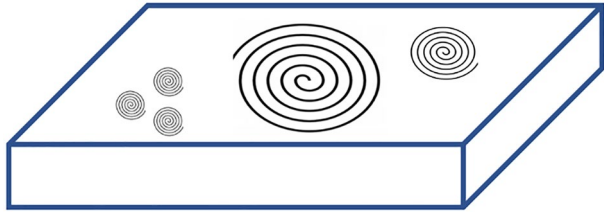


a hierarchical order inhabits. Some voices or flowers are subjectively ordered as more prevalent in diverted situations, while other flowers are weaker and more limited in their appearance in diverted situations (Fig. 10).

We have to take in consideration that the PMV is not determining our externalization process, whereby it can impact our way, “How we create new signs and hierarchical orders,” in our meadow by the connection between self and environment. Where we are standing and what we are seeing in the meadow is creating an externalization, slightly differently, according to the situation we encounter as self. Understandably, some voices might be stronger, based on the meaning-making, in some situations than others. Through time the voices are reconstructed, re-elaborated and new seeds are scattered. This means that the forces of the hyper-generalized sign fields can have different origins while some voices are present at all times, grow into trees, others voices can be more newly laid, but appears more frequently as others, repeatedly appearances of the same kind of flowers in the meadow. If the infinite ruptures impulses, based on the multivoiced networking with the self, create enough tension a gestalt explosion can be triggered, evoking a restructuring of the self’s positioning and its constructed meadow.

Looking closer into the construction of a voice, it seems that the voices are exposed toward the same meaning-making process as we have in the self. Every voice/self-positioning is metaphorically presentable in the meadow as a plant that resulted out of the projections made while it was dialoguing with the environment. This results in the conclusion that every single plant in the meadow does not only participate in the meaning-constructing identification process but also results out of these same processes. A flower in the meadow inhabits therefore the same spiral like core “movements/growth” as these from which the flowers originated, similar as an echoing it preserves the information’s of that specific current self’s identification. These information’s of the flowers informs us—like the DNA strings do for a geneticist—of the essence of a specific self-positioning—which

Fig. 11 A model of meadow with spiral *loci* in the system



we as caretaker defined as worth to cultivate in our meadow—information's that could be defined in the language of spirals as its curvaton, direction, high, and repetitions.

It is here essential to see that the combination of spirals with the meadow, is an already existing metaphor of the natural resources on our planet. In multiple situations, we are confronted with the spirality of the nature, for example we have the sunflowers seed pattern and the so-called annual rings in the trees that already imply the notion of spirals. Nevertheless, the main connection can be found in the natural data storage of genetic information, visualized as the DNA helix.

Based on the previously elaborated conclusions, we realized a model that represents the meadow, whereby the spiral will be used to represent the flowers and the meaning that inhabits them (Fig. 11).

Figure 11 shows a field of spiral *loci*'s, inhabiting a small diversity of possible information's. Unfortunately, the draft like construct of Fig. 11 is unable to represent two missing dimension that are bonded to the coexistence of a meadow. The spirals should be interacting with each other's, as mutual influencing forces, representing the co-existence of the different flowers in the meadow. Furthermore, role of the time dimension is insufficient connected to this model. The model needs a deeper understanding of the whole polysemic-connectivity, which can be integrated by the meadow's multiple layers of earth and its atmosphere. This new dimensional direction gains the ability to demonstrate clearer how an "at the same time existing construct" can impact in a diversity of situations the self's direction and projections.

For example, the trees in the meadow are longer and stronger connected as some new seeded flowers. Furthermore, there are seeds of other flowers that did not flourish or lost their ability over time to grow, by changes of the meadow's nutritional-value in its soil.

In this example, we are confronted with the diversity of self-positions, which are different in their elaboration process manifested in a diverted time period and frame and gained therefore a different form and positioning in our meadow. Therefore, it is crucial to leave the construction of s-dimensional spirals behind and to add the layers of different time periods allowing us to elaborating clearer how the meadow is able to impact the self by its current positioning in the now, while using the projections of the past and future: *the spiral enters the three-dimensionality in the form of an un-linear helix*.

The spirals conserve their role as a symbolization of voices, which are inhabiting the meadow for only a short period, whereby also the seeds will be illustrated as seeds. An example on how this process can be understood in the everyday life of an individual, will be added in the following retrospective described scene:

Scene 2 (Inspired by Osamu Dazai's Book, *No longer Human*, published 1958, p. 21–22):

If I look back to my childhood, I remember clearly the fascination I had about places that nobody explained to me, places that were hidden or so trivial for the grown-

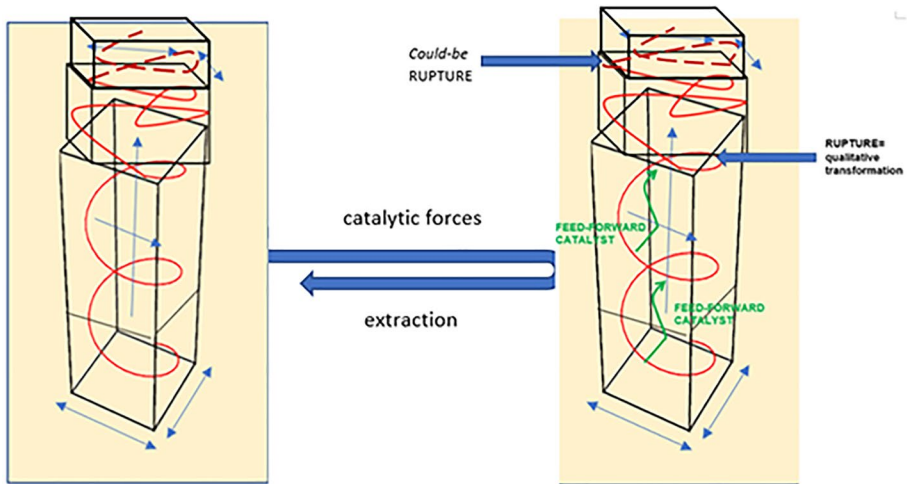


Fig. 12 Spiral catalysts in the helical dialogical self

ups that it did not need to be explained. I see myself climbing on fences, that I thought were built only for that purpose, a playground for us children. Later this illusion disappeared when my mother explained to me what the actual purpose on the garden fences was. I lost interest in climbing over them and hunting for something new unknown. I am sure that at this moment I experienced a “Gestalts explosion” that led me to change my self-identification process and triggered my new meaning-making. But even twenty years after those words of my mother, when I am walking through the streets passing the gardens with their fences, I feel how my hand moves toward the metal that feels cold but refreshing. At this moment I am remembering my past meaning behind these garden fences. The memory of the sparkling unknown reappears that impacted my-self in the past and I think at that moment the forgotten seeds regrow in my meadow and impacts my past meaning-making.

In this scene, we can see the diversity of how the meaning-making process can be impacted, changed and rechanged (Fig. 12). In this figure, the spirals turn through the dimensions of the personal field of meanings (“meadow”) and connect like a string all the hyper-generalized sign fields with each other. A string that moves lead by the notions, created by the *PMV* overlapping of voices, of spirals, that inhabits our meadow our self was directed to and creates in such a manner a *helix* that represents in its three-dimensionality the networking process we experienced, we thought we experienced, we could experience and we want or do not want to experience.

The networking process we experience is always connected with its potential future and its subjective manipulated remembered past. In Fig. 12, this potential future gains the form of a dashed redline. “What could be in the future” is a projection, we initialize by the knowledge we can access from our experience and from our situation and believes in the now. This potential future is used by us to see, if our current direction is allowing us to reach our current goals and to identify what should be changed to reach this currently defined goals. The self-positions that we can see in our current situations gain the ability to modulate our “movement/direction.” This results into the ability of

the spirals, that surround our current self, to impact the self's movement by a deflection of further movement as a "feedforward catalyst."

In conclusion, the developing knowledge of humankind, through the time, can be mapped through the multi-faceted use of different fields and allow us to elaborate the weakness of current psychology while demonstrating the possibility to overcome its linear restrictions. The current self is definable as similar to a frozen river, where an endless row of ice sculptures leave us the feeling of endless row of meadows. They are created through the time in which the self is findable in a manifold of positionings in the meadow, which as well changes from one frame to another. By connecting these moments, a line gets visible that slowly moves in a spiral-like form through the time and visualize a unilinear helix that is forced to find its connecting dot in a repetitive process (Fig. 12). From one moment to another drastically changes can be happening in the meaning-making process, whereby those will be showing up in a later time, if not a new rupture deformed the direction and repulsion the current self is experiencing.

General Discussion: Opportunities Through New Metaphors

The historical roots of the spiral and helix are well engrained in nature. The meaning we gave the spirals in scientific meaning making surpass the classical meaning behind the classical mechanical forms that are unable to break through its closed process circulation. This has already shown its productivity since the 1950s in the double-helix model of DNA in genetics.

Psychology is at the doorstep of integration of the astrophysical, mathematical, and semiotic fields in the phenomenological psychological lens. Abstraction of nonlinear field notions match with our ordinary experience as human beings the everyday life is needed to get closer to a more holistic (*Ganzheitlich*) understanding of the meaning-making process and self-identification process of the humankind. Through connecting the multi-faceted interests of other sciences, while embedding them in the psychological field we gain the ability to simplify the multi-dimensional complex constructions without distorting their multi-dimensional connections. The process of our self-identification is not related to mechanical processes that are restricted in their modality and manifold forms. New metaphoric abstractions built on the referencing complex networks—"meadow" (Campill, 2021) or "mycorrhiza" (Engeström, 2006) are first examples in this new direction.

This new direction in abstract models' construction does not deny its origins. It is undeniable that the spiral is resulting out of the concept of line and rotative notion and has several meanings. Likewise, the extension of the spiral into helix in the third dimension leads to possibility to include constructs of infinity, completeness, and nothingness (Bang & Winter-Lindqvist, 2016) which are needed for our general human science. These theoretical innovations are particularly notable through their initialization of breaking or stagnating in the restrictions of linearity. The evolution of the humankind is an endless lifelong process that cannot result in completeness, like the spiral it is impacted through the starting point but is not completely restricted by it.

The common meaning of the spiral allows human beings to illustrate something that otherwise would remain behind our phenomenological understandings of life, death, suffering, happiness, and fatigue in human living. While it is crucial for psychology to benefit from the meaning-making processes in everyday life, it is the dynamic spiral of abstraction that allows for generality and specificity of experience to proceed in unity. Psychological research has lived over a century in the desire of assuming the axiom of

linearity. It is necessary to underline that the line is a small section of the grand helical existence, that can help us to break through its social stereotyping, but while focusing on it we hinder us to see the process behind the misleading simplified linearity of a conceptuality. It is productive to use the shared meaning to create a network that allows to share the unshared knowledge inhabited in every single field and being. For example, the roots of post-Euclidean geometry allow psychology to see the importance to be confronted with a new kind of model construction, as the spiral and its raise into its 3-dimensionality. Like a read string that moves led by *director* and *repulsor*, created by the *PMV* overlapping of voices, and creates in such a manner a *helix* that represents in its three-dimensionality the networking process. This networking process we experience is always connected with its potential future and its subjective manipulated remembered past. The notion of spirals redefines the line into something that inhabits the lines meaning while ignoring the notions, restrictions of linearity, receives the ability to follow the dynamic process, by neglecting fewer dimensions interfering in the change of the individuals *meaning-making*. We conclude that the empirical understanding of psychology—as it has been caught in limited options of abstract models—could widen its horizons to consider nonlinear forms and organic images of wholistic systems in its theorizing.

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Declarations

Ethical Approval This study does not contain any studies with human participants or animals by the authors.

Conflict of Interest The authors declare that they have no conflicts of interest.

References

- Acerbi, F. (2013). Aristotle and Euclid's postulates. *The Classical Quarterly*, 63(2), 680–685.
- Bang, J., & Winther-Lindqvist, D. (Eds.). (2016). *Nothingness*. New Brunswick, NJ: Transaction Publishers.
- Belousov, L. (1998). *The dynamic architecture of a developing organism*. Dordrecht: Kluwer.
- Cabell, K. R., and Valsiner, J. (Eds.) (2014). *The catalyzing mind: Beyond models of causality*. Vol. 11 of *Advances of Theoretical Psychology*. New York: Springer.
- Campbell, J. (2002). *The flight of the wild gander*. (p. 117, *Illustrated, Reprint* (Revised). Novato, CA: New World Library.
- Campill, M. A. (2021). Towards a Wholistic Model of Identity: why Not a Meadow? *Integrative psychological and Behavioral Science.*, 55(1), 112–127.
- Campill, M. A. and von Fircks, E. (in preparation). The pluralistic-self. To be submitted to *Journal of Constructivist Research*.
- Cavallaro, D. (2015). *The art of Studio Gainax: experimentation, style and innovation at the leading edge of anime*. McFarland.
- Dazai, O. (1958). *No longer human* (Vol. 357). New Directions Publishing.
- Deutsch, M. (1954). Field theory in social psychology. *Handbook of social psychology*, 1, 181–222.
- Dunlap, R. A. (1997). *The golden ratio and Fibonacci numbers*. World Scientific.
- Engeström, Y. (2006). Development, movement and agency: Breaking away into mycorrhizae activities. *Building activity theory in practice: Toward the next generation*, 1, 1–43.
- Fleckenstein, J. O. (1975). 8.2. Kepler and Neoplatonism. *Vistas in Astronomy*, 18, 427–438.
- Fujisawa, C. (1959). *Zen and Shinto* (p. 92). The Story of Japanese Philosophy. New York: Philosophical Library.

- Harcourt, H. M. (2019). *The American Heritage Dictionary of the English Language, Fifth Edition: Fiftieth Anniversary Printing*. London: Dover.
- Harvey, D. C. (2003). 'National' identities and the politics of ancient heritage: continuity and change at ancient monuments in Britain and Ireland, c. 1675–1850. *Transactions of the Institute of British Geographers*, 28(4), 473–487.
- Heinich, N. (1997). *The glory of Van Gogh: An anthropology of admiration*. Princeton University Press.
- Hermans, H. (2001). The dialogical self: Toward a theory of personal and cultural -. *Culture & Psychology*, 7(3), 243–281.
- Ingold, T. (2016). *Lines*. London: Routledge.
- Lamiell, J. (1998). Nomothetic' and 'idiographic': Contrasting Windelband's understanding with contemporary usage. *Theory & Psychology*, 8, 23–38.
- Lewin, K. (1930–1931). Der Übergang von der aristotelischen zur galleischen Denkweise in Biologie und Psychologie. *Erkenntnis*, 1, . 421–466.
- Lewin, K. (1936). *Principles of topological psychology*. Durham: Duke University Press.
- Michell, J. (1999). *Measurement in psychology*. Cambridge, UK: Cambridge University Press.
- Mittelstraß, J. (Ed.). (2016). *Enzyklopädie Philosophie und Wissenschaftstheorie: Bd. 5: Log-N*. Springer-Verlag.
- Nir, D. (2012). Voicing inner conflict: From a dialogical to a negotiational self. In H. Hermans & T. Gieser (Eds.), *Handbook of dialogical self theory* (pp. 284–300). Cambridge, UK: Cambridge University Press.
- Popov, A., & Iacob, A. (2014). *Lobachevsky geometry and modern nonlinear problems*. Switzerland: Birkhäuser.
- Puche Navarro, R. (Ed.). (2009). *Es la mente no lineal?* Cali: Programa editorial Universidad del Valle.
- Rayner, A. (2017). *The origin of life patterns in the natural inclusion of space in flux*. Cham, CH: Springer.
- Taioli, S., Gabbriellini, R., Simonucci, S., Pugno, N. M., & Iorio, A. (2016). Lobachevsky crystallography made real through carbon pseudospheres. *Journal of Physics: Condensed Matter*, 28(13), 13LT01
- Thompson, D'A. . (1917). *On growth and form*. Cambridge, UK: Cambridge University Press.
- Toomela, A., & Valsiner, J. (Eds.). (2010). *Methodological thinking in psychology: 60 years gone astray?* Charlotte, N.C.: Information Age Publishers.
- Tsuda, I. (2001). Toward an interpretation of dynamic neutral activity in terms of chaotic dynamical systems. *Behavioral and Brain Science*, 24, 793–847.
- Valsiner, J. (2005). Attractors, repulsors, and directors: making Dynamic Systems Theory developmental. *Annual Report 2003–2004 of Research and Clinical Center for Child Development, Graduate School of Education, Hokkaido University. Sapporo, No., 27*, 13–35.
- Valsiner, J. (2018). *Ornamented lives*. Charlotte, NC: Information Age Publishers.
- Valsiner, J. (2019). From causality to catalysis in the social sciences. In J. Valsiner (Ed.), *Social philosophy of science for the social sciences* (pp. 125–146). New York: Springer.
- Valsiner, J. (2020). *Sensuality in human living: The cultural psychology of affect*. Cham, CH: Springer Nature (Springer Briefs- Theoretical Advances in Psychology). ISBN 978–3–030–41742–0
- Vogel, H. (1979). A better way to construct the sunflower head. *Mathematical biosciences*, 44(3–4), 179–189.
- Wilson, C. (2000). From Kepler to Newton: Telling the tale. *The Foundations of Newtonian Scholarship*, 223–242.
- Zittoun, T. (2006). *Transitions: Symbolic resources in development*. Charlotte, NC: Information Age Publishers.

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