

ORIGINAL ARTICLE

# Porges’ Polyvagal theory and its possible impact on clinical practice: The Neo-Functionalism perspective

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## Abstract

Under a neurophysiological framework, the Porges ‘polyvagal theory and the Rispoli’ Neo-Functional perspective provide two different approaches in analyzing adaptation responses to the environment, socio-affective and communicative behaviors and psychotherapy in the trauma treatment. In Porges’s phylogenetic model, the vague functioning follows a hierarchical sequence of adaptation, attack-flight, and immobilization responses. Rispoli’s Neo-Functional perspective, instead, while not denying the phylogenetic evolution, contrasts with the hierarchical separation between the two levels of functioning – dorsal vagal branch and ventral vagal branch – an integration of their functioning according to the systemic view at the base of global functioning and multidimensional of the Self. It has been shown that the perceived confidence status is activated both in vagotonia and slight sympatheticotonia conditions.

## INTRODUCTION

This article aims to review the scientific contribution posed by Stephen Porges’ polyvagal theory from a different perspective. According to this theory, our social and defensive behaviour traces back to the adaptive evolution of the ANS, specifically, in the functioning of the vagus nerve. As is known, the vagus nerve intervenes in the expression of many psychological and physiological behavioural aspects associated with social interaction. It is the tenth cranial nerve that circulates the periphery and is also a two-directional channel comprising specialised motor and sensor circuits that participate in regulating the visceral state.

Porges takes into consideration the phylogenetic changes in the structure of the vagus nerve and the role it plays in the neural regulation of the visceral state.

This theory *originates* from MacLean’s scientific heritage and the contribution he made in defining the evolution, as an organising principle, of both the structure of the nervous system and of social adaptation behaviour (Maclean 1984).

## THE POLYVAGAL THEORY

Porges’ polyvagal theory affirms the importance of the phylogenetic origins of the neurovegetative structures that regulate social and defensive behaviours – especially in traumatic situations, in which he believes that there must be a continuous intent to restore conditions of confidence – conditions that (according to his research) are compromised in individuals with autism and severe psychiatric disorders.

From his point of view, any treatment process, in order to be effective, requires, alongside a good relational reciprocity, the patient's perception of feeling confident (Porges 2001).

Specifically, he links the evolution of the autonomic nervous system to emotional experience, emotional expression, facial expressions, vocal communication and effective social behaviour (Porges 2016).

The theory is based on the assumption that adaptive behaviour relies on three neural circuits, each of which supposedly represents a different phylogenetic stage of the autonomic nervous system in vertebrates, each connected to a different feedback system affected by the vagus nerve.

Each stage presumably corresponds to a distinct phylogenetically ordered subsystem, linked, for behaviour, to social communication (facial expression, vocalisation and listening), mobilisation (fight/flight behaviour) and immobilisation (feigned death, vasovagal syncope and complete behavioural shutdown) (Porges 2001).

According to Porges, the phylogenetic order in which these neural circuits have emerged represents a response hierarchy in mammals, for which the most recent neural circuits first respond. The most recent phylogenetic system links the myelinated vagus nerve to the structures of the SES (social engagement system), facial muscles and head (Porges 2016).

## NEO-FUNCTIONALISM

For the Neo-Functionalism and Integrated Systems approach, however, it is not possible to support and accept the phylogenetic hierarchisation given that, as we shall later clarify, it places the functioning of the sympathetic and parasympathetic nervous system in diachronic antagonism and does not take into consideration the existence, in human functioning, of the polarities with all the related nuances (ranges), in addition to Basic Self Experiences (BSE), i.e., the fundamental ways of perceiving the Self in world, which are specific and suitable to each situation. Finally, it does not take into consideration our functioning in an integral and non-hierarchical way (Rispoli 1993; 2004; 2010; 2016).

According to the Neo-Functional approach, this does not mean that it negates the principles of phylogenetic evolution, but rather questions strictly hierarchical, dichotomous or triadic points of view [such as that of McLean or the framing of David Boadella's embryological model (Boadella 1987)] which appear to be reductive compared with the holistic and systemic view that is at the base of the overall and multidimensional functioning of the complexity of the Self (Rispoli 1994; 2004; 2016).

It should be recalled that the Self is the organisation of all Functions (or even Integrated Systems) of the living organism and that the basic Functional Processes are the ways in which the Self is perceived in the world. The integration of the Self is original and the meeting

of basic needs, in relation to the environment, increases and develops all abilities and potentials of a child. The Functions, quoting Rispoli: "*are not part of the organism...; is the entire unity and globality of the Self that is expressed and revealed each time in all its various Functions*" (Rispoli 1994; 2004; 2016).

In fact, according to this view, the functioning of the human being takes place on several planes and levels, which, in addition to being interconnected, are also dynamically integrated and interrelated (see diagram of the Systems Rispoli 2016). In essence, the response hierarchy excludes the systemic complexity of the overall functioning of the human body, remaining on an organicistic view, of the before or after, of the cause or effect, and does not include the overall interfunctionality of all of the Integrated Systems characterising what Rispoli defined as the: "*single integrated meta-system complex* (Rispoli 2016)..."

## INTEGRATED SYSTEM AND VAGOTONIC COLLAPSE

Therefore, in relation to clinical applications for the polyvagal theory the interpretation of abnormal social behaviours is almost entirely related to the physiological state, and mobilisation and immobilisation behaviours would therefore constitute preservation strategies for a person in danger, a danger that can become terrifying. In this view, social behaviour would be an intrinsic property of the autonomic nervous system and threats to survival would lead to a regression (dissolution) of the nervous system, from the more recent positive attitudes of social behaviour to the more primitive "fight-flight" or immobilisation responses to avoid the confrontation altogether (Laborint 1985; Porges 2001; Bessel Van Der Kolk 2015).

Undoubtedly, in a context of extreme danger with associated traumatic shock, there may be an excessive activation (hyper-arousal), such that the sympathetic system may cause maladaptive reactions, such as panic and freezing. However, according to the Neo-Functional view, all this is linked to the clear perception of the inability to react, which is associated with such a high level of fear that leads to immediate physiological reactions, such as, for example, the emptying of the bowels. This is a vagotonic collapse which, however, has nothing to do with the response hierarchy, according to which the more archaic, dorsal vagal circuit would be activated; in conditions of extreme danger, it is clear that no action can be taken to deal with the situation (independently of a hierarchy of neurovegetative structures) and that, therefore, an extreme slowdown state occurs, which leads to immobilisation, due to a very high state of fear (Rispoli 2016).

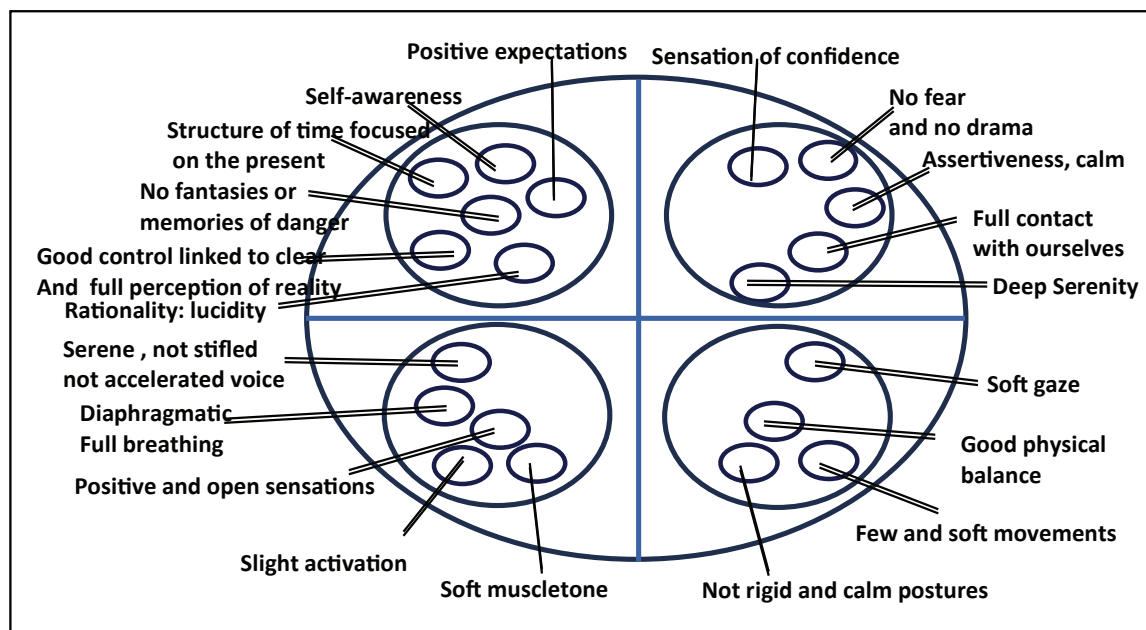


Fig. 1. Diagram of Calm

## STRESS

Viewed from a more general perspective, we need to keep in mind the functioning of stress in the living organism and, specifically, the presence of distress (chronic, permanent and therefore harmful and negative stress). In certain situations of shock, sudden danger too great to be dealt with, not only do we not act, nor go into eustress (positive stress; proactivity towards psychological-physical action) but, on the contrary, we may even faint due to the excessive and sudden transition from a condition of control and sympathicotonia to an “overly” strong and, therefore, non-positive collapse (Seyle 1936;1974).

It is appropriate to clarify here that distress (or negative stress) is linked to traces of previous experiences which, at all levels (cognitive, emotional, postural, sensory, motor, etc.), have led to the defectiveness of one's Functional filter which is impacted by the stressful stimulus, be it to a mild or severe extent (Di Nuovo, Rispoli 2011). What we intend to emphasise is that the functioning of this filter, when faced with a stressor, depends on how, when and how much certain Basic Experiences (or Basic Functional Processes) comprising the filter are altered (up to that time). If we are encountering a condition of strong accumulation of negative conditions within the organism, i.e., a major alteration of the Functional filter, then the impact of the stressful event will be perceived as much more devastating and more serious overall (not only on the cognitive level) and the person will deteriorate into a general condition of persistent activation (“permanent, chronic” sympathicotonia), which is maintained (unknowingly) by chronic alterations of numerous Functions of the Self: the physiological systems of the neurovegetative

system, muscle tone, perceptive thresholds, respiration, chronic and habitual postures (Seyle 1974; Cox 1985; Bottaccioli 2012; Rispoli 2016).

Therefore, freezing when faced with sudden danger is fundamentally linked to a collapse of control, an inability to deal with the event, not only in relation to the severity of the stressor but also because the attrition already in place prevents the human body from fully drawing upon its own resources, which are persistently committed to the condition of chronic stress (distress) (Porges 2001; 2016; 2018; Rispoli 2001; 2004; 2016).

## TRAUMA

As regards the important discussion associated with trauma, it is clear that once the type of trauma and trace left on a psyche-soma level has been distinguished psyche-soma (if it concerns a single event or repeated abuse), the complexity of the effects that perturb the well-being of the person include, alongside the impairment of neuroception, the habitual tendency to being in the dangerous situation, given that some Functions remain chronically activated, such as muscle tone tending towards hypertonicity, rapid thoracic breathing, the emotion of fear and worry, stiffening of posture and movement (Ogden *et al* 2006).

In fact, it concerns an alteration not only of Functions of the Self, but of the Basic Functioning on which the trauma has had an impact, alterations involving the hyperactivation of the neuronal pathways, neurovegetative pathways, certain neurotransmitters, respiration (in the thoracic sense), pain perception thresholds, etc. The individual Functions remain altered if the Basic Functional Processes are altered too.

BESs or Basic Experiences of the Self, are a set of Functions, each of which assumes a certain position in its own range, between one polarity and the other. They are the ways in which needs are realised. Rispoli defined them as the building blocks on which life is built (Rispoli, 2004).

The neurovegetative Function, to give an example, remains altered (in the sense of chronic sympathicotonic activation with possible vagotonic collapses) if different BESs are altered (due to negative life events or the presence of trauma or repeated trauma); furthermore, the alteration is not caused by the occurrence of a single, extemporaneous, challenging situation, but by the presence of several episodes that compromise the various BESs (Rispoli 1993; 2001; 2004). It is interesting to remember that the nervous system of a person who has suffered a trauma is trapped within the state of alert or sympathetic state, as though the danger were constantly ongoing. In this case, it is necessary to consider to what extent and which Functions are chronically altered, which BESs are lacking, defiled or altered, such that the person loses their flexibility in moving from one BES to another, making it difficult or impossible for them to acquire Basic Experiences that are overly compromised (Rispoli 2010; 2016).

### THE FUNCTIONAL INTERVENTION ON THE EFFECTS OF TRAUMA

As regards the treatment of the trauma, according to Luciano Rispoli: *“our approach is far from desensitisation interventions such as EMDR; surely the application of techniques aims to remove a condition of complete collapse, where the facial expression is that of a lost person, who is no longer interacting with another. Interactions become interrupted, undermined and considered dangerous and, therefore, there is doubt that there is a need to restore trust in the operator, the alliance, the sharing. Reliving or remembering trauma is not said to be really curative; nor is it enough or exhaustive to think of simply getting the person out of the dorsal vagal state (but then how, if the breathing types and ways of recovering those that are useful for this procedure are unknown? Something that Functional therapy has long known?). None of this is enough: you have to bring the person – as we have mentioned – to work on sharing, being taken up, being held, etc., which is not simply confidence but has to do with basic Functional processes that must be immediately reactivated”* (In-Depth Thematic Seminar held in Naples, January 2018).

Specifically, it is very important to understand, observe and differentiate between the patient's feelings, states of calm and well-being and states bordering on alteration, to learn and discriminate between when they are calm and when they are collapsing. It should be recalled that the functionings in the Calm BES involve clearly open and positive sensations, memories are present and fluid, movements are soft, thinking is vague, breathing is diaphragmatic and vagotonic,

muscle tone is not tense, as shown in the Figure 1, the Functional Diagram of Calm (Rispoli 2004; 2014; 2016).

In contrast, an individual suffering from traumatic syndrome is characterised by: chronic fear (terror) beyond reality, fuelled by fantasies and terrifying memories, a state of full alert (represented by thoracic sympathicotonic breathing, accelerated heart rate, adrenaline release, dilated pupils, frozen face and not in relation to others, stiff posture, almost no movement, cold hands and vasoconstriction), which is essentially extreme and chronic stress, typical of a person who cannot react.

In the event of this latter condition, the therapeutic intervention, or rather the therapeutic project, will not begin by immediately restoring calm, but will rather work mainly on dissolving other psycho-somatic dysfunctions identified based on the specific and precise configuration characterising that patient.

For example, in the case of post-traumatic stress disorder (PTSD), it should be noted that the individual is in an emergency situation: alongside the altered functionings that the person may have, the configuration to which we refer is that of freezing, or immobilisation (Meyer *et al* 1993; Bergh, 2005).

We can see the difference in terms of intervention compared with EMDR treatment: this recaptures the memory through eye movement and reassures the person at that moment. It is a desensitisation technique based on decreasing the negative emotions of the trauma and increasing awareness and cortical control (Parnell 2013). However, it should be remembered that humans do not function in this way, solely with the presence of awareness and rationality. With this type of technique, there will undoubtedly be less emotion of anguish in remembering the trauma, but it cannot be said that the person is treated as a whole. As Rispoli emphasises: *“the importance in PTSD is restoring all altered Functionings in their full polarity* (Rispoli 2016)”.

Rispoli – in support of what has been stated – mentions the sacred rite of the cave in some primitive populations, where it was discovered that the subject who needed to be helped was placed in a niche of a cave in which was filled with the amplified sounds of the priests' voice. In that niche, the amplified sound is above 150 hertz. However, the most interesting discovery is that *“the brain does not react to all frequencies, but to a specific frequency, precisely at 150 hertz. At this frequency, the opposite happens to what EMDR intends to do, i.e., it increases the person's emotional condition with a direct influence on the hypothalamus in terms of activation: more emotionality and less cognition”* (In-Depth Thematic Seminar held in Naples, January 2018).

When there is an acute emergency situation, the person is powerless, cannot act because they do not have the resources to deal with too serious a danger and, therefore, the reaction is of total vagotonic collapse (total in the sense that the condition of collapse impacts all systems).



This concerns very recent trauma and ongoing emergency situations.

However, in the case of old trauma that the patient brings to therapy, when a long time has elapsed since the occurrence of the events that have affected him or her, the person is not paralysed, there is no need for urgent intervention on the acute traumatic condition; therefore, it is possible and necessary to work on the individual's altered Basic Functional Processes, in order to restore their health and well-being. Once a child has become an adult, they will have recovered some Basic Functional Processes due to a positive interaction with the environment, thus being able to resume their life. However, it is a partial, incomplete, not an optimal, recovery, which, therefore, needs to be definitively treated in a global and overall perspective in terms of all Systems of the Self, without necessarily having to recall (to reduce the negative emotional charge) the traumatic event itself (Bovo 1998).

### SELF-REGULATION

All this helps us to better understand how self-regulation is a functioning that is already present in a small child and, to be activated, does not need the affective figure of reference – as Porges claims – (something that would, in any case, be very difficult to achieve). It is also understood that self-regulation can fail or change precisely due to the fact that the environment interferes negatively with the child's development, by not facilitating the positive experiencing of various Basic Experiences. This difficulty positively consolidates Basic Experiences that then lead to chronic alterations of the various Functions of our body (and of self-regulation), such as a lack of vagotonia, vagotonic collapses, lack of or excessive presence of neurotransmitters of activation or calm, etc (Bovo 2000; Hans-Rudolf & Neuhuber 2000).

### SOCIAL INTERACTION AND THE VARIOUS STATES OF THE VAGUS NERVE

Porges states that: *"the dorsal vagal state and the state of activation of the sympathetic nervous system, in their apparent antithesis, are united by the fact that the individual feels endangered and this does not enable them to get involved in a serene social interaction, given that the body is dealing with a threat"* (Porges 2016; 2018); however, in this regard, we must also emphasise that social interaction is not just vagotonia! Once again, we must emphasise that our Basic Functional Processes have changed, with diversified Functional configurations on all levels.

Regulation must not be confused with calm and easing. When there is no longer a danger, the individual does not return to a state of regulation (assumed to be lost) but rather of calm and easing, i.e., in a state other than activation and in BESs that do not involve acting

and dealing, but letting go, recovering and tranquillity (Rispoli 2018).

In other words, the individual does not lose regulation, but passes from one type of state to another, depending on what he or she intends to put in place in the various situations in which he or she finds him or herself in, according to the BES in which he or she is or wants to be in.

Therefore, the condition of immobility (which Porges attributes to dorsal vagal activation) when the danger cannot be dealt with, partly because it is associated with a lack of internal resources, is not a lack of regulation but a certain state in which the individual enters. Even the state of freezing defined by Porges as a dorsal vagal reaction (a vigilant shutdown, characterised by a complete cessation of movement, except for breaching and eye movements, sustained heart rate, stiff and tense muscles) (Porges 2001), for us, is an obvious condition – as we have already clarified – of chronic stress associated with very strong emotional components of fear, due to the inability to deal with a situation and loss of control (control deficit) due to the inability to control the situation (Rispoli 2018).

### THE POLYVAGAL THEORY VS NEO-FUNCTIONALISM

By analysing the discussion related to the polyvagal theory, Stephen Porges studied the evolution of the autonomic nervous system by associating it with emotional expression and actual social behaviour (Porges 2001).

However, according to this study, the traditional antagonism of the functioning of the sympathetic nervous system compared with the parasympathetic nervous system is questioned from a hierarchical perspective of the autonomic nervous system, inspired by the evolutionary theory of the 3 brains by psychiatrist-neurologist Paul McLean who, as we shall recall, divided the brain into three main systems: the Reptilian brain (encephalic trunk), the Mammalian brain (limbic system) and Consciousness (neocortex) (Maclean & Gallino 1984).

The **reptilian brain**, the oldest brain, is the site of primary instincts, autonomous bodily functions, of the territory, capture and defence, behaviours concerning coupling, the fight-flight response and also those occurring in a group and that form social hierarchies. In humans (who preserve the stratifications of evolution) this instance can be considered the animal and most archaic part, in contact with primordial instincts and autonomous fight and flight reactions, as well as more complex reactions such as competition, in complete absence of moral conscience. REPTILIAN: cobra, predator, rapid, works with passion, aggressive, self-reporting, erotic hedonistic love. reptilian: body, breath, sensations, contractions, physicality of the experience, beating heart, hot/cold.

REPTILE LEVELS: 1st- territoriality, possession, aggression problems around food, digestion; 2nd- sexuality and survival serving the species (competition problems, shyness, fear of fighting); 3rd- rigid maps of the territory with stereotypical and ritualistic behaviours (trauma), learning to get out of things that people

consider safe. Disorientation is typical of this pathological situation of the reptile.

4th- survival from attack by a predator (impotence, resignation, death plan).

**The limbic system** (mammalian) is the evolution of the reptilian part that represents a progress of the nervous system, increasing the ability to face the environment, related to nourishment, feelings and emotions, associating external messages with endogenous ones (substances produced by our body). Being the site of emotions, it also enables us to take care, protect, seek and maintain closeness, etc. With this brain, the sense of attachment has developed (theory forming the basis of modern psychotherapy), which enables the survival, including the physical survival, of living beings through sentimental-emotional bonding and social cohesion.

**La neocortex** (most recent, neopallium) site of language and mind (images, thoughts, memories, associations, cognition) and of behaviours based on problem solving, which enable us to deal with new situations and to predict the future: cognitive and rational functions; creates connections between the phenomena that happen to us, determining their causes according to subjective knowledge; includes all cognitive and rational functions.

Similarly, Porges, in his theory, hypothesised that adaptive behaviours rely on three hierarchically ordered neural circuits (myelinated vagus nerve, the paravertebral ganglia of the spinal cord and the non-myelinated vagus nerve), each of which he suggests corresponds to a different phylogenetic stage of the autonomic nervous system. The main component involved in the vagus nerve itself, the tenth cranial nerve, which is a neural system that communicates bidirectionally between the viscera and the brain, both as a direct motor nerve from the encephalic trunk to the various controlled peripheral organs and as an afferent sensory system that informs of the state of the viscera.

Specifically, Porges claims that the myelinated vagus nerve (ventral vagal complex) is the most recent phylogenetic subsystem and is exclusive to mammals; it has the function of ensuring the social communication system (facial expression, vocalisation and listening) and inhibiting the sympathetic influence, determining a state of calm and low metabolic expenditure (momentary deactivation of the hypothalamus – pituitary – adrenal axis).

Secondly, there is the ortho-sympathetic subsystem, comprising the paravertebral ganglia of the spinal cord, with an activating function (arousal), which enables the focusing of attention, facilitates the use of energy and predisposes the body to active avoidance reactions, such as fight or flight behaviours, mediated by adrenaline and noradrenaline. Finally, the non-myelinated vagus nerve (dorsal vagal complex starting from the dorsal motor nucleus), the most archaic subsystem – present in most vertebrates – implements passive avoidance, until immobilisation (feigned death, vasovagal syncope and behavioural shutdown) (Porges 2001).

It is clear that committing to this hierarchical view in Neo-Functional terms would be very difficult because it would mean accepting a stop & go logic or a hierarchy of responses that, in other words, would completely rule out the sense of integration of Functions which forms the basis of Neo-Functionalism, that is, that our com-

plex and unitary functioning is based on all innervations of the vagus nerve and on all levels of the body.

Therefore, our “being in relationship” cannot be the result of the good functioning of the myelinated vagus nerve (ventral vagal) alone; for example, during times of tenderness and pampering we are in vagotonia, not in sympathicotonia; in the same way, during a more heated confrontation or a discussion, there will be a greater modular activation towards the other polarity, sympathicotonia.

Furthermore, according to Porges, when the environment is perceived as confident, the entire body is regulated in order to promote relief and social exchange (increase in the activity of the myelinated vagus nerve, which slows the heart rate, inhibits the fight-flight mechanism, interrupts the stress response of the hypothalamus – pituitary – adrenal axis) (Porges 2016). When, in contrast, danger is perceived, the sympathetic nervous system is activated, facilitating active avoidance reactions, in order to fight or flight.

Once again, emphasis is placed on the existence of two vagal circuits rather than a single one, on the importance of the hierarchical relationship between them and on the consideration of all defensive responses as adaptive towards environmental challenges: therefore, the hypothesis is that there a sympathetic-adrenergic reaction exists that is responsible for our mobilisation responses (fight/flight) and a dorsal vagal reaction which, when activated in conditions of confidence, has the essential role of maintaining homeostasis (Porges 2016; 2018).

However, this analysis is also due to our poorly shared scientific approach, given that the activation of the sympathetic system in our model is not associated with phylogenetic adaptation and, above all, does not only occur in the event of danger and, therefore, in response to the need to fight or flight to defend oneself. Overall mobilisation (i.e., increased muscle tension, oxygenation, vasoconstriction, accelerated heart rate, inhibition of the gastro-intestinal tract, etc.) occurs on all psychological and bodily levels; emotional expression does not only concern anger and fear, but also other emotions and Basic Functional Processes, such as Confidence, Strength, Pride, Assertiveness and Self-Affirmation.

According to Neo-Functionalism, there is no hierarchical separation between the two levels of functioning: one attributable to the dorsal vagal branch and other to the ventral vagal branch but rather an integration of the functioning of both; just as there is no detachment between physiological and social functionings (Rispoli 1992; Lang 2001).

In fact, it makes no sense to consider the development of the ventral vagal circuit as a subsequent and specific stage of upper mammals with the primary function of “slowing down” the activity of the sympathetic nervous system and, therefore with the “superior” regulation function, so as to represent the stage of social relations: i.e., a ventral vagal system that stops

the “instinctive” sympathetic system as though it were negative.

The ventral vagal branch, in turn, comprises two components: a visceral motor component that regulates the viscera above the diaphragm (heart and breathing) and a somatomotor components that regulates the muscles of the neck, face and head and, therefore, smile, eye contact, vocalisation, listening).

It is now clear that it is unthinkable to speak of a biological-psychological-social competition between the sympathetic system and the parasympathetic system, given that both compete and collaborate for the adaptive and self-regulatory action of the body-person, along with the rich range of nuances that involves, on the physiological plane, two polarities: sympathicotonia – vagotonia as both have the right of expressive fullness in the individual's well-being, in both situations of danger and in situations of confidence (Rispoli 2010; 2016).

It is important to emphasise that the condition of safety is not activated exclusively in the vagotonic state. Consequently, it is clear that the person, depending on the situation he or she is facing and based on the condition of his or her Functionings, either the reptilian system (inhibition and immobilisation) or the fight-flight response (active reaction) or social interaction through eye contact, facial expression or vocalisation will be activated, but not, however, as three different brains nor as hierarchical progression associated with phylogenetic evolution.

The defensive response of collapse (shutdown), according to Neo-Functionalism, does not result, for example, as Porges claims, from reptilian heritage (MacLean); it is not true that if the ventral vagal circuit (which, as is known, has a calming effect on the heart, reduces sympathetic reactivity and promotes social engagement behaviours) “fails” the second, older, circuit inherited from reptiles subsequently intervenes and shutdown occurs.

As Rispoli states, this does not represent a “*paradoxical adaptive advantage*”, but rather an overall dysfunction of the body-person, which may lead to collapse in situations of extreme danger (In-Depth Thematic Seminar for functional psychotherapists held at the European School of Functional Psychotherapy, located in Naples, in May 27<sup>th</sup> 2017).

“*When the danger is very strong and overwhelming*”, emphasises Rispoli, “*there is no longer eustress (a condition of beneficial activation that enables the obstacle and danger to be overcome), but a condition of intense trauma that cannot be dealt with and produces dysfunctional effects on all psychological-bodily levels, a state of overall exhaustion that also plays a defensive “disappearing” function when faced with imminent danger*”. Furthermore, on the cognitive level, a condition of mental dullness is experienced, which is associated with a negative emotion, mainly based on panic fear.

Therefore, the study of stress and its potential chronicity can very well clarify, in a broader and more comprehensive perspective, what the Polyvagal Theory

intends to emphasise when our autonomic nervous system is continuously engaged in defensive activities; that is, that traumatic situations or situations of prolonged stress can become potentially harmful to our physical and mental health, given that there is a chronic lack of balance between the various branches of the autonomic nervous system (Di Nuovo & Rispoli 2011).

## PSYCHOTHERAPY, CONFIDENCE AND SELF-REGULATION

As regards the containing and protective function of the therapeutic setting, the polyvagal theory emphasises the need to create confidence conditions to restore the lost physiological homeostasis, without which the individual would be incapable of physiological and emotional regulation (Porges 2018).

In contrast, according to Rispoli: “*It is not scientific reality to state that the regulation of physiological states only occurs within a confident context, represented exclusively by the mother's mind*” and, therefore, represented in psychotherapy by the therapist. This would mean affirming that the human “cubs” would be completely dependent upon the adult's intervention as regards the regulation of their psychological and physiological state. This would negate the scientific result of all discoveries (Stern 1995), beginning with the experiment by Meltzoff and Borton (1979) and all research on pre-natal life and the new-born baby realized by Bovo & Rispoli during the period of 1995–2007, who maintain the innate ability of a child to be independent in regulating his or her own physiological state as early as in their mother's womb, precisely in terms of adaptive strategies of hyper-arousal (hyper-vigilance state) and hypo-arousal (relaxation state). Cardiac variability – associated with stress and respiration – is defined precociously, even before birth itself.

**hyper-vigilance state** Characterised by tachycardia, excessive sweating, rapid breathing, physical and motor agitation, muscle tension, tendency towards action, increased attentive abilities, focus and mnesic speed, decision-making immediacy and determination (e.g.: fight, flight, action shutdown)

**hypo-arousal (relaxation state)** Characterised by heart rate, reduced blood pressure, slower breathing, reduced muscle tone, lack of energy, reduced attentive abilities, reduced memory and reasoning (e.g.: fainting)

Only in the event in which there is a mother who continually bombards the child's psychological and physical development with anxiety or anger is it clear that certain Basic Functional Processes are altered in the child; conversely, if conditions are favourable during pregnancy, the new-born will adapt well and will maintain his or her self-regulation ability, therefore there will be no need for specific caregiver activity; as research on the “healthy new-born baby” teaches, the child will maintain his or her positive conditions, even in an unfavourable environment, as a result of his or her well-being during pregnancy, at least until the end



of the third month according to Bovo “unpublished results” 1997–2007.

In support of what has been stated until now, namely, that it is not only the vagal condition that ensures our body the necessary balance between flexibility or stability, but there are psychological and bodily changes due to the person's various Basic Functional Processes in different situations. Regulation does not occur through our social exchanges; in contrast, our physiological and physical parameters are regulated by the body of the child itself (unless there are strong negative interferences) and, only afterwards, will social changes help to regulate them further (Bovo 2000).

As regards regulation during psychotherapy, it is clear that our position diverges substantially from Porges' point of view, according to whom, as previously mentioned, clinical intervention is aimed at restoring homeostasis: “*Clinical observation in psychotherapy enables us to notice sudden changes in the expression of emotions, such as the transition from a neutral to an angry expression and to observe in vivo the self-regulation behaviours that are put in place to return to a condition of balance*” (Porges 2014).

According to the Neo-Functional approach, during psychotherapy, the changes observed are not simply expressive-emotional changes associated with physiological self-regulation; they are rather those associated with the restoration of various abilities, the recovery of various altered or deficient Basic Functional Processes (restoring the original integration of the Self), through the use of specific therapeutic techniques associated with various BESs, by going back over them several times and giving the person back the possibility of going from one BES to another, depending on life situations (Rispoli 2016).

BESs, or Basic Experiences, are a set of Functions, each of which assumes a certain position in its own range between one polarity and the other. They are the ways in which needs are realised. Rispoli defined them as the building blocks on which life is built (Rispoli 2004).

Therefore, the therapeutic setting is characterised not only by confidence, but also by a welcoming and open atmosphere, as well as clarity on objectives and methods, in order to create empathic sharing and a good therapeutic alliance, so that the “new parent” (therapist) can accompany the patient on his or her journey of going back over deficient or altered BESs. However, this does not mean that the patient returns to a regulation ability only in confidence conditions, as this would mean neglecting an entire series of Basic Functional Processes that are extremely important for a person's life.

With this in mind, it is necessary to review the “supremacy” of confidence as an exclusive and essential condition for which a person can “be in contact with” or be well regulated and able to adapt to the environment. The theory of polarities as false antitheses (Rispoli 1993; 2016) makes us understand how, in terms of well-being

of the Self over our lifetime, both safety and danger exist to activate the most appropriate Basic Functional Processes (with the related interconnections of the various integrated systems); in contrast, without perceiving the danger, we would not feel safe and vice versa.

According to Rispoli, the functioning of life is not based on the ability to remain in balance, in a sort of compromise between two extremes (polarity), but, in contrast, on the ability to move entirely on one polarity and, when needed, to always assume the opposite polarity in full. Human beings do not grow by antithesis – otherwise, they would develop a so-called false Self – but through mobility and integration, ranging in all the nuances and various ranges of polarity, using the Functional configurations (Basic Experiences) of both one polarity and the opposite one.

It is clear that, to overcome a traumatic condition, it is important to create a confident therapeutic environment characterised by an empathetic relationship and appropriate setting; however, according to Neo-Functionalism, the clinical treatment of the trauma is not based on the need to cognitively reconstruct the memory of the past event, of restoring awareness by eliminating the negative emotional part, as this would negate the sense of going back over the Basic Experiences to restore all altered Basic Functional Processes, restoring full health and capacity for life (Rispoli 1994;2001; 2004; 2016).

## THE DIAGNOSTIC LEVEL

From a diagnostic point of view, identifying the habitual style of activation of the patient – which Porges maps by measuring the degrees of reactions of the ANS along a continuum between hypoarousal and hyperarousal – can be analysed if understood as the identification of a tendency, a prevalence, in short, a functioning stereotype that leads the patient to stay longer in one situation rather than in another, to visit some Basic Experiences more frequently. This often concerns BESs that require sympatheticotonia and, consequently, calm, well-being, sharing and tranquillity can be lacking. However, as has already been stated several times, this has nothing to do with the sympathetic-parasympathetic dichotomy (danger vs. safety). In relation to the Integrated Systems, we can say that calm is not a psychological-physical condition associated exclusively to the functioning of the ANS. In fact, it has now been shown that it concerns everything surround it: the neurotransmitters of calm (such as serotonin), muscle tone, the symbolic level values, movements and postures, i.e., all levels of the Integrated Systems (Rispoli 2016).

## THE IMPORTANCE OF VOICE

An interesting focus to consider carefully is what Porges states regarding the therapist's vocal tone in clinical dialogue. The scientist points out that higher frequencies are associated with the presence of anxiety and fear and that the presence of low tones and high volumes are associated only with anger and aggression ([www.stateofmind.it/2014/12](http://www.stateofmind.it/2014/12)).



Please refer to the interview published at [www.stateofmind.it/2014/12](http://www.stateofmind.it/2014/12) in which Stephen Porges states that: "The evolution of our nervous system has led to the formation of neural circuits present in the middle ear, which preferentially acknowledge the frequencies associated with the human voice and distinguish them between positive and calming frequencies and anxiety and/or threatening frequencies; the perception of the various frequencies is capable of directly activating the nervous system and producing response behaviours associated with the perceived frequency".

From his point of view: "*Patients are also led to constantly judge the therapist's emotional state, by listening, above all, to the intonation of his or her voice, as an expression of his or her internal regulation*" (neuroception) (Porges 2014). In fact, beyond the concept of the therapist's regulation, what is interesting is this reference to the use of Voice – as a psychological-bodily Function – in clinical dialogue, understood, above all, as an important factor of the therapist's Auxiliary Self, which is not only a confidence index and regulator of emotionality, but a support to the conduct of corrective techniques and experiences aimed at recovering lacking or altered Basic Experiences in a precise and clear manner. In fact, during the Functional psychotherapy intervention, a lot of work is carried out on the low and calm diaphragmatic voice, not of the throat, head, i.e., opposite polarities from screams, cries and reproaches that may have contributed strongly to the structuring of alterations in the patient's life (Rispoli 1992; Meyer *et al* 1993; Rispoli 1994).

Recent research on autism testifies to the idea that there are likely (among other causes) auditory sensory alterations at the base of this pathology, alterations that create problems of confusion and fear in small children. One of the effects would concern the great difficulty of these children to have a relationship with each other. The discovery of mirror neurons, that is, a cognitive motor ability, has enabled investigations to be launched, in which the autistic children are presented with fundamental movements associated with various emotional and perceptive states, reconstructing an internal vocabulary and motor intelligence, which enable an understanding and relationship with each other due to mirror neurons (Rizzolatti & Sinigaglia 2006).

## THE THERAPY AND REGULATION

During the therapeutic process, the conceptualisation of the therapist as a co-regulator of the patient's emotional and mental state is overcome; the skills that emerge during the therapy, as well as the exploration of hidden or unknown resources, have to do with a possibility of change that goes well beyond the goal of welcoming the patient, relieving symptoms, making them aware of what is not so, unblocking bodily areas, etc. (Rispoli 2004). In fact, during Functional psychotherapy (which is an *integrated* psychotherapy), the intervention is carried out on all levels of the Self, given that *multiple factors of change* are used, especially those relating to the recovery of specific Basic Functional

Processes on which action is needed, by means of specific techniques. In this context, it is easy to understand the importance of the concept of the *modularity* of the setting and of the relationship between the therapist and the patient, a setting and mode that must differ according to the BESs on which the intervention is being carried out. For example, **eye contact** during a therapy session can differ depending on whether work is being carried out on *Contact* or on the *Being Led*, or on *Planning* or *Remembering*, in which case the patient should not be left to wander without having to respond to the therapist's gaze (Rispoli 2016).

In other words, although it is known that the trace of a confident attachment experience is based on appropriate eye contact (in terms of emotional colouring, intensity, duration), we need to remember that the child has a certain independence in his or her ability to regulate his or her states of arousal, an ability he or she is born with and does not learn from eye contact with the caregiver (Bovo 1998).

It should now be understood that capacity for life (and, consequently, treatment methods) cannot be based on full and continuous awareness and cannot be limited to mental capacity alone, given that human beings do not function in this way, with a present and constant awareness, which is rather only one of the multiple Functions of the entire Self. For example, we do not know what happens in our arm whilst we are talking, we are not always aware of our bowel movements and we do not notice all the small movements in all parts of our body. If we did, we would simply be unable to function in life.

In the same way, in therapy, we can support the patient in reconnecting with bodily sensations and, therefore, being more aware of them, but only partially, only at certain times and in certain experiences.

For the rest, we accompany him or her, above all, in modifying the altered Basic Functional Processes. This occurs gradually: gradually, the old dysfunctional traces disappear and are replaced by integrated Basic Functional Processes.

The application of our techniques enables us to accurately and effectively restore – by going back over them time and time again – the altered BESs, the Basic Functional Processes to be restored. For instance, movement alone is not worked on if the intention is to recover an active reaction ability when there is a lack of energy, nor is awareness alone worked on if the intention is to recover a foundation of calm. Functional intervention acts simultaneously on various psychological and bodily levels of the Self (not considered hierarchically), specifically guided in order to recover precisely the Basic Functional Processes that are lacking and altered: *Calm, Well-Being, the ability to Loosen Control, Just Being, Calm Strength, Taking, etc* (Rispoli, 1993; 2001; 2004; 2010; 2013; 2016).

## POLYVAGAL SYNDROME AND TRAUMA

In an attempt to represent the pathological aspect of polyvagal syndrome, Stephen Porges has identified 4 different clusters that describe the progressive relationship between appearance and increased symptoms in relation to internal physiological responses. The observational focus is the on/off functioning of the myelinated ventral vagal system. During the interview, Porges states that this system “tends to turn on and off during an interaction and leave room for temporary, more or less intense responses, only to return to a condition of balance”.

However, in this description, a clear description cannot be found in the division of clusters in terms of precise specifications and differences; however, above all, once again, the fundamental point according to Neo-Functionalism is taken into consideration, i.e., that the treatment, the change in therapy really takes place if the dysfunctions are changed deep down and, thus, the deficient or altered BESs are recovered on all psychological and bodily levels, in all Integrated Systems.

For example, the first pathological cluster, characterised by: “An attenuation of the social involvement system and, therefore, a reduction in the ventral vagal activity, which manifests in a flat facial expression, especially in the upper part of the orbicular muscles, low reactivity and a high sensitivity to sounds” (Porges 2014) does not define which Basic Experiences are altered, the impact on other Systems, nor the links with vagotonia or sympathicotonia.

The second, continues Porges: “is characterised instead by high reactivity and mobilisation, directly related to the activity of the sympathetic system: here, an atypical regulation of the emotional state is observed, with rapid shifts between calm and reactivity and a state of hypervigilance typical of anxiety and impulsive behaviours” (Porges 2014). From our point of view, the rapid shifts may, instead, represent the normality of the functioning (understood as Functional mobility or a rapid transition from one pole to another), clearly read in view of the alternating trend of the Functions between two opposite polarities that enable a person to have every single range of emotions available, physiological balance, etc. (Rispoli 1994). If, however, there is inertia in remaining in one polarity, a stereotyped and chronic prevalence, then there is an alteration in the mode of functioning.

In relation to the third cluster, Porges states that “it is characterised by the alternation between the sympathetic and dorsal vagal system and manifests as a vulnerable towards collapse and dissociation. It manifests with episodes of hypotension, absence or reduction in the state of consciousness, fibromyalgia, intestinal problems and reduced mobilisation behaviour”. As regards this classification, according to Neo-Functionalists, there are no sufficient elements to be able to define and frame the vulnerability towards collapse and dis-

sociation. Neither is it clear what determines the other characteristics.

The fourth, which is defined as actual dissociation, is that which manifests in shutdown or chronic collapse, due to the activation of the dorsal vagal system as a generalised defensive response to various situations of stress or perceived danger. As a result of research work shared with most of the scientific community, it turns out that this is a very common state in victims of abuse and violence and is an extreme defence response towards a potentially lethal threat.

Certainly, when the trauma is relational, the affected individual tends to perceive any other human as a source of extreme danger. According to the Functional approach, in therapeutic work, rather than understanding what, in the environment, stimulates this reaction, it is necessary to devote ourselves to dissolving the consequences of the trauma, leading the individual to work on sharing, feeling gripped, held, etc., which is not simply confidence but concerns the Basic Functional Processes that must be immediately reactivated through the possibility that therapy offers: going back over these BESs time and again to overcome existing alterations.

## CONCLUSIONS

Undoubtedly, it is necessary to acknowledge that, beyond the considerations and differences with Neo-Functionalism stated so far, the polyvagal theory certainly has some interesting effects on a clinical level, given that it emphasises the importance of the motor sense, positive physical sensations, the importance of perceptions of voice and the combination between confidence and non-confidence.

However – as we have already clarified – from our point of view, it is still limiting, given that, in Functional psychology, all Systems of the Self are acted upon, considered in their complex interrelations and in their non-hierarchical integration, polarities are taken into account, the various BESs and the various Basic Functional Processes.

## REFERENCES

- 1 Balestra CI, Bouancheaux-Zuckerman E, Balestra Co. (2008). Introduction à la communication: guide pratique de communication en entreprise (Introduction to Communication: practical guide to business communication). Ed. La Chartre/B&E Brugge, ISBN 9782874033742, 425 p.
- 2 Bergh O (2005). Negative Affectivity and Enhanced Symptom Reports: Differentiating Between Symptoms in Men and Women, in Social Science & Medicine, 61 (8) p.1835-1845.
- 3 Boadella D (1987). *Biosintesi (Biosynthesis)* Ed. Astrolabio, Roma, ISBN 8834008979, 256 p.
- 4 Bottaccioli Francesco (a cura di) (2012). Stress e vita (Stress and Life) Ed Tecniche Nuove, Milano, ISBN 8848128548, 566 p.

- 5 Bovo P (1998). Psicoprofilassi prenatale e in puerperio: indicazioni e limiti. (Prenatal psychoprophylaxis and in puerperium indication and limits) *Educare* **4**, 1998, Pavia, p.41–43
- 6 Bovo P (2000). "La metodologia Funzionale. Un metodo basato sulla fisiologia per la prevenzione dei disturbi del bambino e della madre." (the Functional Methodology. A method based on physiology for the prevention of disorders of the child and the mother) *D&D* **30**, p.53–55
- 7 Bowlby J (1969–1973). *Attaccamento e perdita (Attachment and Loss) vol. I II e III Basic Books, New York, ISBN 0465005390-0465097162. 428 p.; 444 p.; 324 p.*
- 8 Bunkan B.H, Thornquist E, Radøy L.(1982). *Psikomotorist behandling. Festskrift til Aadel Bülow-Hansen, Universitetsforlaget, Oslo.*
- 9 Bunkan BH, Thornquist E (1990). "Psychomotor therapy: an approach to the evaluation and treatment of psychosomatic disorders" in Hegna T, Sveram M (a cura di) *Psychological and Psychosomatic disorders. International Perspectives in Physical Therapy*, Churchill, Livingstone.
- 10 Burke MJ, Brief AP, George JM (1993). The role of negative affectivity in understanding relations between self-reports of stressors and strains: A comment on the applied psychology literature, in *Journal of Applied Psychology*, **78** (3) p. 402–412.
- 11 Cohen F (1987). Measurement of Coping in Kasl S. V. & Cooper C. L. (Eds.) *Stress and Health: Issues in research methodology*, Wiley Chichester, p. 283–305.
- 12 Cox T (1985). The nature and measurement of stress, in *Ergonomics Journal*, **28**, p.1155–1163
- 13 Di Nuovo S, Rispoli L (2001). *L'analisi Funzionale dello stress: dalla clinica alla psicologia applicata, (Stress Functional analysis: from clinic to applied psychology) Ed. Franco Angeli, Milano, ISBN 9788856840872, 144 p.*
- 14 Folkman S, Moskowitz JT (2004). Coping: Pitfalls and promise, in *Annual Review of Psychology*, **55**, p. 745–774
- 15 Hans-Rudolf B., Neuhuber LW. (2000). Anatomia funzionale e chimica del sistema vagale afferente *Neuroscienza del sistema neurovegetativo, (Functional and Chemical Anatomy of the afferent vagal system) Neuroscience of the Neurovegetative system) Base e Clinica* **85** p.1–17
- 16 Hinde RA (1975). *Non verbal Communication*, Ed. Cambridge University Press ISBN 0521290120, 476 p.
- 17 Laborit H. (1985). *L'inhibition de l'action (The inhibition of the action) Ed. Elsevier Masson, Amsterdam, ISBN 2225806411, 332p.*
- 18 Laudadio A, Perez FJ. e Mazzocchetti L (2011). *Valutare la resilienza (Evaluate Resilience) Ed. Carocci, Roma, ISBN 8843057499, 158 p.*
- 19 Lo Verso G, Ceruti M (a cura di) (1998). *Epistemologia e psicoterapia (Epistemology and Psychotherapy) Ed. Raffaello Cortina, Milano ISBN 8870785180, 356 p.*
- 20 MacLean PD (1984). *Evoluzione del cervello e comportamento umano (Brain Evolution and Human Behavior) Ed. Einaudi, Torino, ISBN 88-06-05684-0, 120 p.*
- 21 Marlock G, Weiss Halko (a cura di) (2006). *Handbuch der Körperpsychotherapie, Schattauer GmbH (handbook of Body Psychotherapy) Stuttgart, ISBN 978379452473, 999p.*
- 22 Martini N, Nervo vago (Vagus Nerve) Ed. Mousse Publishing, London, ISBN 8867490427, 160 p.
- 23 Meyer R, Liénard G (1992). *Les somatothérapies : historique, classification, présentation, (Somatotherapies: history, classification, presentation) Ed. Simep, Parigi, ISBN 2225839875 , 230 p.*
- 24 Meyer R, Maurer Y, Rispoli L, Zaruchas W (1993). *Etudes cliniques psychothérapeutiques et somatothérapeutiques (Psychotherapeutic and Somatotherapeutic clinical studies) Ed. SIMEP, Paris, ISBN 2225842863, p.156.*
- 25 Parnell L (2013). *Attachment-Focused EMDR. Healing Relational Trauma*, Norton, New York, ISBN 0393707458, p.432
- 26 Ogden P, Minton K, Pain C (2012). *Il trauma e il corpo. Manuale di psicoterapia senso motoria (Trauma and the body. Manual of motor sense psychotherapy) Ed. ISC, Alghero, ISBN 8897386032, p.320.*
- 27 Ogden P, Minton K, Pain C, Daniel J. Siegel, Van der Kolk B (2006). *Trauma and the Body: a Sensorimotor Approach to Psychotherapy*, Ed Norton, New York ISBN 0393704572, 384 p.
- 28 Podsakoff PM, MacKenzie SB, Lee JY Podsakoff NP (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies, in *Journal of Applied Psychology*, **88** (5) p. 879–903
- 29 Porges S (2001). The polyvagal theory: phylogenetic substrates of a social nervous system in *International Journal of Psychophysiology*, **42**, p. 123–146
- 30 Porges S (2016). *La teoria polivagale. Fondamenti neurofisiologici delle emozioni, dell'attaccamento, della comunicazione e dell'autoregolazione (The polyvagal theory. Neurophysiological foundations of emotions, attachment, communication and self-regulation) Ed. Giovanni Fioriti, Roma, ISBN 8898991029, 368 p.*
- 31 Porges S (2018). *La guida alla teoria polivagale. Il potere trasformativo della sensazione di sicurezza, (The guide to the polyvagal theory. The transformative power of the feeling of security) Ed. Giovanni Fioriti, Roma, ISBN 8898991606, 204 p.*
- 32 Rispoli L (1992). *Touch and contact in the different phases of therapy: the auxiliary Self, The Art of Contact*, Bernard Maul Ed, Berlin, ISBN 3980304809, p. 315–323
- 33 Rispoli L (1992). *La psychothérapie: un projet européen novateur (The psychotherapy : an European innovative project), La lettre de la Somatothérapie" supplement de la revue Somatothérapie* **16**, Strasbourg.
- 34 Rispoli L (1993). *Psicologia Funzionale del Sé, (Functional Psychology of the Self) Ed. Astrolabio, Roma, ISBN 8834011027, 256p.*
- 35 Rispoli L (1994). *La psicoterapia Funzionale nel gruppo e nell'Istituzione (Functional psychotherapy in the group and in the institution) Archivio di neurologia psichiatria e psicologia. Gruppo-analisi e Istituzioni: modelli, confronti e setting" Università Cattolica, Roma, 3.*
- 36 Rispoli L (2001). *Functional Psychology and the basic Experience of the Self in Heller M. (ed.) "The Flesh of the Soul: The Body we Work with", Ed. Peter Lang, Bern, ISBN 9783906764986, p.307*
- 37 Rispoli L (2004). *The basic Experiences and the Development of the Self: development front the point of view of Functional Psychotherapy*, Ed. Peter Lang, Bern, ISBN 3039117505, p.444
- 38 Rispoli L (2010). *Il manifesto del Funzionalismo moderno (the manifesto of modern Functionalism) Ed. Alpes, Roma, ISBN 8865312173, 44 p.*
- 39 Rispoli L (2013). *Il paradigma espressivo-corporeo e La psicoterapia Funzionale (The expressive-bodily paradigm and Functional psychotherapy) in "Dizionario di psicoterapia" a cura di A. Salvini, G. Nardone, Ed. Garzanti, Milano, ISBN 978-8811740933, 700 p.*
- 40 Rispoli L (2016). *Il Corpo in Psicoterapia oggi. Neo-Funzionalismo e Sistemi integrati, (The body in psychotherapy today. Neo-Functionalism and Integrated Systems) Ed. Franco Angeli, Milano, ISBN 9788891738738, 210 p.*
- 41 Rizzolatti G. Sinigaglia C (2006). *So quel che fai. Il cervello che agisce e i neuroni specchio, (I know what you do. The brain that acts and the mirror neurons) Ed. Cortina, Milano, ISBN 8860300027, 226 p.*
- 42 Selye H (1936). *A sindrome Produced by Diverse Nocuous Agents in Nature*, in *Nature*, **138**, p. 30–32
- 43 Seyle H (1975). *Stress Without Distress*, Ed. Penguin Group, New York, ISBN 9780451136350, 193 p.
- 44 Selye H (1976). *Stress in Health and Disease*, Ed. Butterworths, Oxford, ISBN 97880407985100, 1256 p.
- 45 Spiegel D, Riba MB. (2015). *Managing anxiety and depression during treatment*, *Breast Journal* 2015, **21**, 97–103.
- 46 Van Der Kolk B (2015). *il corpo accusa il colpo, (The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma) Ed. Raffaello Cortina, Milano, ISBN 9788860307583, 501 p.*