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Chapter

“The Knowing How to Regulate Oneself”: Transversal Competence Between Parenting Skills, Biological Determination, Deficits in Primary or Secondary Disorders, and the Role of Specific Rehabilitation in Developmental Age

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Abstract

The regulation underlies numerous developmental processes during the life cycle and intervenes in sensory processing, attachment, management of the self in relation to the other and the environment, the attunement of the affects, experimentation of interactions, the configuration of relationships, resilience, and intersubjectivity. The regulation typically occurs from the earliest stage of life. The child defines his interactive style mediated by his motor dimension through appropriate processing of stimuli adapting himself to the physical and social environment through the tonic dialogue and he also reaches the ability to manage, control, and attunement of affects and emotional states within complex dynamics in adulthood with more developed cognitive skills through the “tonic dialogue”. The construct emerges on a neurobiological and neuroanatomical basis, which describes the individual subject’s peculiar way of reacting and relating to the world: the temperament. The relational and reactive style modifies and defines itself in a strictly individual manner based on the subject’s life experiences, especially of social nature. The interactive modes, the ruptures, and the repairs that characterise the relationship with the primary caregiver leave an imprinting that the subject retains throughout his life which will define his relational style, as much as it may change according to the interacting part. From the pathological front, regulatory disorders require a global, highly specific rehabilitative treatment which aims at the developmental needs of the child. Neuro and psychomotor therapy of developmental age intervenes in all aspects of regulatory disorders and plays a role that is not only rehabilitative and abilitative but also preventive, as reduces the risk that the disorder may evolve into further clinical conditions, especially of a psychopathological nature.

Keywords: regulation, attunement, neuro and psychomotor therapy of developmental age, transversal competencies, regulatory disorders, setting

1. Introduction

Regulation deficit frequently occurs in comorbidity in clearly nosographic-defined neurodevelopmental disorders. Nevertheless, the difficulty of isolating regulatory disorders in developmental age, and proceeding with exclusive diagnoses of the disorder, often undermines its progressive assessment and its evolution into disorders that continue in the development of the subject under evaluation and treatment. Regulatory disorders are therefore alterations that are present but not always classified as main disorders as much as secondary and they require accurate reading abilities and identification as they invoke concepts such as intricacy, mutability, and transience.

2. Affects regulation and tonic dialogue—self and hetero regulation and RM

The regulation is a construct that is intrinsic to every individual and in every era of life, regardless of whether the developmental trajectory can be identified as typical or not.

The regulation intervenes in a plurality of conditions; among these appears to be particularly relevant the capability to congruously elaborate internal and external stimuli of sensory, perceptive, or social nature, to develop appropriate and adaptive responses.

Hill [1] speaks of affect regulation, the affects are distinguished into two categories: the primary affects which are defined as the somatic representation of the organism's state, namely that which produces a sensation from the arousal signalling of our internal organs and the categorial affects, which are identified in emotions.

During development, as well as at every stage of life, it is necessary to structure stable affections that can create favourable conditions for implementing new skills and allow attunement to others because of the social necessity that characterises the human being. Recognising the affections, building them, and keeping them steady over time is an indispensable condition for the basis of an individual's development. The state of homeostasis occurs, in fact, when we are regulated within the boundaries of our "*window of tolerance*". The concept of "*window of tolerance*" is systematised by D. Siegel in [2], who defines it as that ideal space, graphically included between two parallel lines, in which the subject oscillates daily in a variable manner; boundaries of our window of tolerance are represented by the two lines, one leaning towards the high state of arousal (hyper-arousal) and the other one leaning towards a low state of arousal (hypo-arousal). On the other hand, when the threshold of the arousal decreases or increases transcending the abovementioned boundaries, we are in a state of "*dis-regulation*". What enables us to come back to an optimal state of regulation is the personal ability of resilience, defined by Cicchetti as "*the ability of individuals to recover their functioning after exposure to stress-induced dysregulation*". Freud [3] speaks of a "*protective shield against stimuli*", a barrier with which the child is naturally endowed and it protects himself from external stimuli that could potentially exceed

his threshold of sensory analysis. More recently, we come to Erikson [4], who states that the little child, like everyone else, possesses certain optimal levels of stimulation, below which stimulation will be sought and above which it will be avoided.

The child actively regulates the exchange with the outside world, as everyone does at all ages. Individuals with different psychiatric disorders seem to have different thresholds, typically higher or lower concerning the quantity and duration of tolerated stimulation.

Becoming dysregulated is a common occurrence in daily living. Adaptive functioning is maximised when a controlled condition can be recovered effectively. The subject should have primarily well-regulated loved ones since only in this way he can engage in new and fruitful situations and relate to others more effectively since his relational availability is implemented. This availability out to be a condition that is not always experienced optimally in various disease patterns, as it could also be altered secondarily precisely because of atypicality and dysfunctional regulation processes. If there is dysregulation of loved ones there could be a condition of ineffectiveness and fallibility of relationships and pasts, as well as a negative condition that could lead to the development of inappropriate response strategies to the condition of insecurity in relationships.

The regulation skills are built over time by structuring themselves above a neurobiological and genetic substratum such as temperamental profile and the subject's experience, especially of the social nature with the caregiver of reference. *Temperament*, which has a not negligible neurobiological matrix, is defined by how the subject approaches his surroundings, stably delineating the reactive quality that characterises the child, and regulating the responses given to environmental and social stimuli.

The relationship with the parent, especially in the neonatal period, is crucial in the definition of *hetero-regulatory processes*, which take time to shape since at birth there are only primitive forms of *self-regulation* such as self-consolation, thumb sucking, and then moving on to strategies such as distraction management. The role of the other in the process of defining regulation is not only limited to that containing availability that shapes the attachment bond but is also important for the modelling mechanisms that the subject uses from the observations of others to be able to delineate his peculiar regulation strategies.

Mother and child learn in their interactive exchange, to take turns and read each other's signals, maturing progressively finer modes of interpretation. These experiences are for Bowlby [5] translated into *Internal Operating Models* (I.O.M) of Attachment, which can be defined as a “package” of cognitive-affective-relational interpersonal behaviours that mediate attachment relationships throughout life. These mother-child interactive modes develop as internalised actions managed by implicit processes, constituting an automated mode of relating to the attachment figure. The I. O.M also fulfils an assimilative function, which in principle has an adaptive value that is not always realised. Social experiences are filtered and absorbed and on the bases of performed expectations, relationships are interpreted. This condition, which leads to the management of attention, perception, and representation, enables what happens to the individual to be read and interpreted based on experiences. There are primary and secondary attachment models, depending on the specific attachment figure. The ability to regulate emerges from the attachment relationship, which is precocious and pre-verbal and is defined starting from a state of non-autonomy by the child.

The structuring of regulation strategies follows, clearly, the subject's overall development trajectories: the child refines his emotional and behavioural reading skills of the other, gives meanings and relates in a progressive more coherent manner.

Communicative-linguistic development also provides an increasingly valid and effective tool for the child to channel the emotions and his emotional and affective contents on this channel. Cognitive development, which from 18 months onwards, by the Piagetian memory, proceeds more and more towards the structuring of the symbolic capacity, gives the child an important tool for structuring congruent self- and hetero-regulatory strategies. The first real form of modulation of one's states of regulation mediated by others is the *tonic dialogue*. In the earliest stages of development, being able to modulate oneself in relation first to the other and then to the environment occurs through contact exchange in the early construction of the mother-child dyad.

In the early stages, regulation passes through the condition of exclusively exchanging muscle tone, where it is typically the mother who initially modifies herself according to the child's "questions and reactions". Over time, the child perceives a modification of the Other according to the expression of his needs, observing the purely motor aspects. The tone acts as a balancer of the exchange, adapting to the child's needs, and acts as means of communication in which conditions such as safety, stability, boundaries, and affection are involved. Subsequently, the child will gradually use the tonic dialogue through the exercise of mutual regulation with the mother, to engage in expressive and receptive communication with the environment, express needs, consciously modified his muscle tone, and regulate emotions and adaptive responses according to the appropriately processed stimulus.

These milestones of human development pass through five major areas of adaptive child development, within the first early interactions that are:

1. *Biological regulation*: the ability to regularise all biological processes, including nutrition and sleep-wake rhythm. It occurs during the first month of a child's life and allows the first social encounters to take place, which need to be regulated and made stable and to which the child is naturally predisposed as demonstrated by his innate sensitivity and reactivity to the caregiver's voice, expression, and gestures. Within this first phase, it is relevant to speak of "*modelling*", to which reference must be made and to which both the parental couple and the infant are subjected. Modelling consists of specific "adjustments", that are unique to each relationship; therefore, it is appropriate to recall Sander's [6] theory of "*Cross-Fostering*", whereby mutual adaption occurs specifically for each parent-child pair. The progressive evolution of the first social exchanges is also mediated by early imitative processes, which take on a much higher social value than the mere repetition and motor and gestural learning: neonatal imitation is constituted as a social and primarily communicative linking tool, which is conveyed in order or not to accept the behaviour of the CG. A deficit condition in the abovementioned skills produces cascading alterations in motor, communicative, cognitive, and social learning.
2. *Vis-à-vis exchanges*: the ability to adjust one's facial expression in relation to what is proposed in front of our field of vision or about specific sensory stimuli. This competence is present from the age of 2 months since we need to allow our visual sense organ to mature so that we can move from paying attention only to the contours of stimuli to an increase in visual acuity. The first socialising smiles appear at this stage, progressing into more direct and prolonged visual contact. This development passes through the mother's modulation of the levels of activation and synchronisation of the child's gaze, which will lead to the developmental maturation around the seventh month of the no longer

indiscriminate smile. At this stage of development, the “*Turn Taking*”, the alternation of roles, is experienced; it is later observed more in vocal exchanges, as the child and parent influence each other. The aim is to create a very early form of “conversation” untethered from tonic dialogue to keep the created interaction stable. The main characteristic of the exchange is contingency, understood as the temporal dimension of the exchange, characterised by rhythmic behaviour, matching, and mirroring, which in interactive experiences emerge facilitating self-regulation and dyadic regulation in the child and the dyad, and laying the foundations for empathic competencies. The communicative-social tool that defines these relationships is the *referential gaze*; looking at each other and imitating facial expressions are the manifestation of the interactive coordination established in the dyad. This condition, which Trevarthen calls “*primary intersubjectivity*”, is realised through neonatal imitation and proto-conversations and is based on brain circuits capable of integrating expressing eye, mouth, voice, hand movements, and posture.

3. *Sharing of topics*: a progressive form of regulation that consists of the beginning to shift the attention to situations outside the dyad but needing to share them first through the gaze, and later with the capacity for attention and action on the same. This stage, which appears in typical development from the age of 5 months, provides a condition of increased flexibility in the child’s attention capacity, who will be able to shift attention towards an element outside the dyad; at the same time, motor-fine skills also allow this form of experimentation, in line with cognitive development. Initially, the child will experiment alone with the object, and later he will integrate the new experience with the object and the caregiver. This is where the skills of “*co-orientation*” appear, leading to two or more people dwelling on the same common focal point. This is the key to start of the structuring of what Trevarthen calls “*secondary intersubjectivity*”.
4. *Reciprocity*: a condition that leads to the emergence of the interest in and recognition of the Other, so that it begins to be more flexible in finding a common focus. It is the stage that appears between 8 and 9 months and allows the child to engage simultaneously in different activities, which previously could only be experienced through a single experience, without being able to integrate perceived stimuli. Reciprocity brings the child to the experimentation of playing roles with the partner that is now coordinated and exchangeable. Reciprocity must be implemented by the concept of “*intentionality*”, which allows one to plan one’s behaviour and anticipate its consequences so that the child can fully participate in social interactions. This condition must provide from the child’s point of view, flexibility and elasticity in managing the regulation of affections and emotionality such as can support him in the first real social relationships in experimentation. The qualitative refinement of the second dimension of intersubjectivity, combined with the physiological maturations that the child experiences from the cognitive point of view, makes him aware that the other also has his attentional focus and thus inserts him into an exchange articulated by requesting and declarative messages. The maturation of secondary intersubjectivity allows the subject to mature from what was once a form of attention definable as “*mutual*”, whose main focus is the other in its physicality and expressiveness, called “*joint*” (or shared), which is precisely the condition in which both partners focus their attentional resources on a common focus interest.

5. *Symbolic representation*: an area with strong connotations linked to both cognition and language development. It is defined as the child's ability to use verbal and symbolic tools in relationships and exchanges with others, in order not only to be able to carry out an exchange in the present but also to reflect on them once they are concluded. This last stage begins to develop between 9 and 10 months, but is consolidated once discrete levels of communication have been reached; the ultimate aim is to impose oneself based on social references read in the environment. Trevarthen, in connection with this, argues that the language which the child acquires after the first year of life is the cumulative effect of the maturation of primary and secondary subjectivity. The child looks around him for clues, both in expression and in the behaviour of others, which should lead to his assessment of the situation. This process must include the ability to process the understanding of the event, whereby the child must through the acquisition of sensory perceptions and also the sum of all the reactions produced by others towards oneself and towards the environment, implements one's own search for social references. From 9 months onwards, the child experiences a real evolutionary drive in the motor, cognitive, emotional, social, and communicative spheres. He becomes fully aware of the physical and mental differentiation from the other; however, the child's regulatory strategies seem to be strictly dependent on the dyadic system in which he is embedded. Intersubjectivity can also be understood also from a dynamic systems perspective, as self-awareness goes beyond mere bodily boundaries to include the other who self-regulates himself [7, 8].

During interactions with the adult, the child often experiences “*mismatches*”, which are moments of dyssynchrony that generate negative emotions and stress. This stress, which is typical of every relationship, can be caused by various conditions, such as lack of emotional synchronisation, unclear signals or not being understood correctly. Most mother-child dyads constantly reach a state of mismatch, which they manage to repair in subsequent interactions. The stress that is spoken of as resulting from the lack of synchronisation is, however, a springboard to go on to build what are “*coping*” strategies, which are functional to the structuring of the child's character, and, in successful cases, capable of providing the child with an important sense of efficacy and competence; they can then be generalised in different contexts, with an important adaptive value.

In case of unsucess, the child experiences many failures and to equally curb the negative feelings resulting from the mismatch, he structures self-regulatory strategies that limit the interactive-social capabilities.

Various coping strategies can be experienced by the child, chosen based on elements which are not only contextual but also purely temperamental; summarised by Gianino into the following:

- *Signalling*, which can be positive, neutral or negative, while maintaining the objective of remaining in the sharing;
- *Attention elsewhere*, on an object or on himself;
- *Self-consolation*, using one's own body includes: oral stimulation, rocking, intertwining fingers;

- *Withdrawal;*
- *Escape;*
- *Gaze avoidance/visual exploration.*

When the child uses strategies which are different from signalling, renounces both social involvement and sometimes involvement with objects, trying to self-regulate. The individual differences that characterise the children and their modes of expression in terms of emotional manifestations and the prevailing mood tone seem to originate from the way of functioning of the adult-child dyad, who are partners in an affective communicative exchange.

The goals that the child sets include social, relational, and self-centred goals, such as achieving internal homeostasis. The driving force behind the activity is always the motivation, which resides in the final idea that the child structures, and is fuelled by the emotional equipment (positive and negative) that animates the child. The set goals are not always successfully achieved, and the experiences of fallibility that the child may experience are not uncommon. However, the negative experience of failure, with its negative emotional corollary, is an ambivalent experience which can lead both to reshape of the strategy resulting in success and also to renunciation. The child does not have all the resources he would need to achieve all his goals, and this is a risk factor for experiencing repeated failures, and consequently repeated negative emotional experiences. Nevertheless, this does not happen, as the child is placed in an interactive context, in a system of affective communication, in which the child's efforts are read, interpreted, and supported by the CG; from a functional point of view, the messages that the child sends to its CG are called by Tronick and Gianino “*hetero-directed regulatory behaviours*”, emphasising their regulatory function in relation to the behaviour of the interacting subject.

On the other hand, behaviours such as self-stimulation or averting one's gaze are referred by the same to as “*self-directed regulatory behaviour*”, that the child engages to regulate, control, and modify its affective state. The distinction between self-directed and hetero-directed regulatory behaviour is not always clear; what is certain is that these are behaviours that are part of the child's repertoire for dealing with stressful situations that can generate negative affections and excessive positive affections that can turn into distress situations.

These behaviours are so important because they act to allow the child to contain the potentially disruptive effects of his emotions, the uncontrolled expression of which could interfere with the implementation of strategies aimed at the fulfilment of the child's goals. Both self-directed and hetero-directed regulatory behaviours allow the child to exercise control over his emotional state, interact with those around him and act on the world around him.

Children and adults are placed in mutually coordinated interactions, where the child quickly takes an active part in communication with a global emotional involvement that can have positive and negative connotations. However, developmental trajectories are highly individual and singular, and this has been explained by Tronick and Gianino as an outcome of the differences and qualitative characterisations of the communication systems in which the subjects are embedded, and by the number and manner in which negative and positive emotional experiences are lived and dealt with. Normally, both conditions are experienced and then balanced towards a positive connotation of the

interactive experience; in abnormal experiences, however, there is a longer duration of periods of interactive failure. The authors suggest that the full experience of success-failure-repair of interactive errors and the transformation of negative affect into positive affect, of interactional-transformative errors of negative affection into positive, produce beneficial effects on the child's development, enhancing their hetero-directed affective and communicative competence, increasing self-regulatory skills and contributes to delineating differentiation with the outside world, and self-identification.

On the contrary, as might be expected, the chronic experience of failure in abnormal interactions produces negative effects on the child's development.

Adopting a self-directed style of regulation, the child changes his focus and turns his attention to the control of negative affects and their effects on disorganised behaviour. Focusing on this strongly self-centred goal limits the experiential repertoire on the external world, not only in relational terms but also in exploratory terms leading to a potential slowdown in cognitive development. The effect on self-esteem is then not negligible: the child will have an image of himself as ineffective, thus tendentially negative self-esteem. The attachment bond will undoubtedly be disturbed: the parent will be perceived as unreliable.

This developmental trajectory is never determined by a single event, but rather by the slow accumulation of interactive and affective experiences with different people and events.

In order for the attunement (regulation of arousal) between Mother and Child to take place there are a series of stimulations, especially at the sensory level, that stimulate different behaviours in each type of relationship:

- *Predictable and tolerable form of Hyper-stimulation;*
- *Intolerable forms of Hyper-stimulation;*
- *Intolerable forms of Hypo-stimulation;*

These three forms generate different responses according to each pair being examined, they often reduce to being as variables as predictable but also unpredictable.

The processes of attunement with the other involve numerous states, such as:

- *Lack of attunement,*
- *Selective attunement,*
- *Imperfect attunement,*
- *Modulations,*
- *Inauthentic attunement,*
- *Excessive attunement.*

Attunement is the key to opening the door to the intersubjectivity between people, which can be used both to enrich one's mental life through the partial union with another and to impoverish it by keeping a part of one's inner experience strictly to

oneself. Thanks to his early emotional-cognitive-social skills, the child can establish intersubjective connections with others from an early age. The process of emotional attunement, together with infants' early imitative capacities, enables them to connect with their caregivers. Infants, in fact, precociously enter into social interactive sequences, through vocalisations, gestures, and glances, in a progressively more attuned manner with caregivers of reference. In the structuring of intersubjectivity, the motor matrix cannot assume a marginal role; “*intercorporeality*” is a fundamental aspect of it. It includes, in fact, a mechanism of recognition of the other's body as similar to one's own, due to the sharing of similar aims and purposes towards which we direct ourselves. Intersubjectivity is properly defined as an experience of “mental contact with the other that takes place during interpersonal communication” [9, 10] (Trevarthen, 1998). Attachment and intersubjectivity are closely related; being attached to someone implies the possibility of developing an intersubjective connection, just as the intersubjective connection with someone can be the first step in forming an attachment bond with that person.

Intersubjective interactions are organised in developmental sequences according to Singer and Hein [11], who speak in particular of four sequences:

- *Emotional contagion*: this occurs when an emotion (e.g., sadness expressed through crying) is transferred to another person (e.g., a child cries when he hears another do so in turn), without being aware that the emotion felt originates from another person.
- *Empathy*: occurs when the individual, aware of the difference with the other, shares the other's emotions.
- *Compassion*: it arises when there is not only an understanding of the other person's emotions but also a feeling of sorrow and a drive to improve the other person's situation.
- *Theory of mind*: is the ability to attribute mental states (beliefs, intents, desires, emotions, knowledge) to oneself, and others, and to understand that others have mental states different from one's own [12].

Manenti [13] speaks of intersubjectivity as a dimension that matures after the individuals involved in the relationship pass through prior relational dimensions. The subject, in fact, needs the others not to be a subject but to live as a subject. Arriving at an intersubjective dimension is a condition that goes beyond the idea that human beings are intrinsically open to sociality since it describes a situation in which the subject is open to the relationship to define not only the relationship but also himself. The intersubjective dimension is composed of mutual changes and exchanges of personal resources, which delineate and define the identity of the involved subjects.

Specifically, Manenti [13] speaks of:

- *The Relational Dimension of the Self*: it conveys the readiness of the I to open up to build social relationships with a “you”. To open up means to give oneself to confrontation, exchange ideas, and cooperate.
- *Interpsychic dimension*: it takes place at the moment when the “Selves” open to the relationship have entered into contact, which is not yet at a level where the “Self” reciprocally exchanges information about themselves. The contact could be

regulated by norms that, on the contrary, isolate the individual “Self” even more, protecting them from mutual interferences.

- *Interpersonal dimension*: it is a dimension that marks a step forward. The two “Selves” available to the relationship, once in contact have established exchanges, characterised by mutual regulation, reciprocity, acceptance, and understanding.
- *Intersubjective dimension*: this is the dimension that goes beyond empathy, sharing, and acceptance. In the intersubjective dimension, the two “Selves” not only have a contact that leads them to have exchanges but also show themselves to be available to each other to allow themselves to be changed, transformed and redefined, thus building a new identity. In the relational fusion, the “Self” fades into the background.

The model that explains how in the above-mentioned interactive experiences there is structuring and evolution of regulation skills is the *Mutual Regulation Model*. The Mutual Regulation Model [14, 15] theorises that during mother-infant interaction the partners have interactional goals and, to achieve them, have different skills at their disposal. The ultimate goal is mutual regulation, which is identified as an interpersonal state of pleasure and attachment. To establish this condition, both must jointly regulate the interaction through interactive behaviours, namely affective manifestation. Thus, the child actively participates in this condition, using the tools at his disposal (smiles, vocalisations, postural adjustments) and his affective system, differentiated already at birth.

Despite this, the mutual regulation process contemplates and recognises the possibility that interactions may encounter physiological failures, due to misunderstanding of the other’s behaviour or the implementation of inappropriate behaviour. These conditions, identifiable as “*mismatch*” in their physiological occurrence, generate negative affections (anger, contempt, sadness) in the child and motivate him to adapt and seek the most functional means of repairing the mismatch and relieving the experience of positive affection (joy, demonstrated interest). However, this can only be achieved in the presence of a sufficiently sensitive partner. Positive and negative affections allow the child to regulate the interaction to achieve the aforementioned reciprocal regulation.

The Regulation Model, defines that the actions carried out by the child through the use of his affective apparatus are used to regulate his interaction, this implies the ability on the part of the child to regulate his affective responses, since within the interaction he has to regulate two aspects of the affect:

- The *Qualitative Dimension*: what the child feels and expresses about the interaction;
- The *Quantitative Dimension*: all those temporal or intensity parameters of affection that are usually measured through parameters such as threshold, latency, ascending time, intensity, and recovery time of an affective manifestation.

In accordance with the mutual regulation model, when there is a disconnection between the partners, the child signals to the partner to change the mismatched behaviour, and the responsive and sensitive partner modifies the stressful condition, relieves the child’s distress, and helps the child to regulate his affective state.

For this reason, self-regulation and interactive regulation are complementary to each other, just as they should be understood as sides of the same coin when assessing the child's social behaviour.

3. Regulatory disorders

Alterations in regulation are transversely present in every clinical picture in developmental age with peculiar ways of expression. Immaturity in the ability to self-regulate can lead to the expression of oppositional, impulsive, aggressive behaviour. This condition may fade naturally, following the child's psychological growth and development trajectory, or it may exacerbate to become a fully disordered condition.

De Gangi, Porge, Sickel, and Greenspan, in a longitudinal study conducted on a population of 4-year-old children, described the progression of dysregulation symptoms towards a pathological trajectory in terms of developmental, sensorimotor, and/or emotional-behavioural deficits at 4 years of age, suggesting that children with an untreated regulatory disorder may not overcome behavioural difficulties.

To be able to distinguish between actual symptoms of the disorder (which may result in psychopathology) and the transient phase of life, age-specific diagnostic criteria would be required. Since these diagnostic criteria do not currently exist, the disorder category has not yet been included in standardised nosography systems such as DSM 5 or ICD-10.

The first to have formulated diagnoses for regulatory disorders was Greenspan [16] who defined regulatory disorders as the co-presence of three fundamental characteristics that negatively affect sensory processing abilities and are expressed through:

- Sensory difficulties,
- Sensory-motor difficulties,
- Information processing difficulties.

These characteristics are due to an excessive or limited reactivity to sensory stimuli, which qualitatively impairs it and the expression of motor skills, and has an impact both at the level of coordination and movement planning. This manifests itself as a clear difficulty in organising movements in sequence.

In regulation disorders, a specific behavioural pattern is usually present, characterised by:

- Disorders concerning the control of action,
- Attention disorders,
- Behavioural disorders,
- Disturbance in the modulation of affective states and interaction with others.

Regulation disorders are characterised by difficulties in regulating behaviour, physiological process, attention, motor skills, and in organising a calm, vigilant or

positive affective state. A child with a regulatory disorder is particularly difficult to manage from the earliest days.

Soon, this generalised dysregulation has negative side effects on the family environment and can lead to chronic stress in parents, which will be further reflected in the quality of the child's responses.

The child may present dysregulation in sleep regulation, feeding or sphincter control, as well as in the area of gross or fine motor skills, in the ability to maintain attention on a detail (or conversely persist on a specific detail), in affects (abrupt transitions from serenity and joy to sadness and anger), in behaviour (aggressive/impulsive).

An early and important dysfunction in the process of affective regulation, inhibitory control, behavioural regulation, etc. can impact functions such as sleep, feeding, and sensory reactivity, predisposing the child to structure relational disorders and symptoms that can be traced back to psychopathological conditions. Clinical symptoms include hypersensitivity, impulsivity, irritability, and hyper/hypo reactivity, with an impact on sleep and feeding. In addition, regulatory disorders may be present and persist even at school age.

The diagnosis of these conditions is complex and also requires the presence of specific sensory difficulties (perception and proprioception of stimuli).

Considering among the causes, children with the most difficult temperament, those with regulatory disorder correspond to a minority at the extreme of this category. These problematic characteristics are generally of a constitutional or maturation nature, but it should not be forgotten that the quality of care may accentuate the difficulties or, on the contrary, diminish them. In the first case, children are exposed to a very high risk of developing other behavioural disorders in later childhood.

These conditions are relatively rare and data on their prevalence in the population are relatively inaccessible, due to the recent diagnostic framing, and certain clinical configurations can be difficult to distinguish from other early developmental difficulties. Treatment consists of providing the best support to the parents, who will have to transfer their regulatory strategies to the child. A successful diagnostic framing, as always, proves to be fundamental and can prevent problematic behavioural and social patterns from developing in the future.

According to what can be deduced, given that regulation is implicated in all stages of growth and development and continues through development, it allows us to tune in to all the stimuli to which the individual is constantly subjected; it can only be stated, that in addition to specific regulation disorders, there is a strong presence of alterations in motor, affective, emotional, mentalising regulation, and all conditions concerning higher cognitive processes such as executive functions, in the comorbidity of developmental and neurodevelopmental diagnoses.

The six capacities of Emotional and Social Functioning are:

- *Attention and regulation* (the beginning is typically observed between birth and 3 months): the infant observes and pays attention to what is happening around him with all senses, such as looking, listening, touching, and moving. The infant can remain sufficiently regulated to maintain attention and interact without hypo or hyper-reacting to external or internal stimuli. As the child, over time, reaches higher levels of functioning, his ability to maintain a sustained and continuous flow of interactions provides evidence of his capacity for age-appropriate attention and regulation.

- *Formation of relationships or mutual engagement* (the beginning is typically observed between 3 and 6 months): the infant develops a relationship with an emotionally available caregiver for the primary purpose of comfort, security, and pleasure. As development progresses, through the support of the caring environment, the infant becomes able to experience the full range of positive and negative emotions, remaining engaged in the relationship.
- *Two-way intentional communication* (the beginning is typically observed between 4 and 10 months): the infant uses gestures, including purposeful displays of affection, to initiate a mutual “conversation”. Simple gestures, such as reaching out to be picked up or pointing to an object that is interesting to him, become a more complex sequence of gestures during the second year of life. Two-way communication becomes a real conversation as the child develops verbal language.
- *Complex gestures and problem solving* (the beginning is typically observed between 10 and 18 months): the child uses emerging symbolic skills and language to acquire what he wants or desires—namely to solve problems. Single gestures are replaced by complex sequences of gestures and actions (e.g., leading a parent towards the desired object). As soon as the child develops language, he uses words and gestures for communication and problem-solving.
- *Use of symbols to express thoughts and feelings* (the beginning is typically observed between 18 and 30 months): the child, using imaginative play and language, begins to express thoughts, ideas, and feelings through symbols. A child can communicate what he imagines through role play, dressing up, and playing with dolls. Imaginative play can represent real-life experiences and stories that the child has known through stories, books, videos, and television. In play scenarios, the child projects his feelings into the characters and actions.
- *Logical connection of symbols and abstract thinking* (the beginning is typically observed between 30 and 48 months): the child can logically connect and process sequences of ideas. He uses logically interconnected ideas in preservations concerning everyday life events and imaginary stories. The stories of children who have reached this level of functioning typically have a beginning, middle, and end. The child can understand abstract concepts, reflect on feelings, and articulate lessons learned from experience.

Attention must be given to all diseases into which a particular regulation problem may develop in childhood, later puberty, and adulthood, in addition to the presence of comorbidity with other diagnoses.

The Diagnostic Classification 0–3 and later the 0–5, proposes different types of regulation disorders that mainly concern the dysregulation of certain basic rhythms (sleep, feeding) and sensory processing, which may however be part of a phenomenal expression of broader and more complex pathologies affecting neurodevelopment.

All disorders related to regulation deficits found in the Diagnostic Classification DC:0–3 and DC:0–5 as well as in the Diagnostic and Statistical Manual of Mental Disorders are proposed below:

Disorders of regulation about sensory processing for Diagnostic Classification DC:0–3 are reported:

- *Sensory processing regulation disorder* which is divided into three forms:

- *Hypersensitive (Type A Fearful-Cautious);*
- *Hypersensitive (type B Negative-Provocateur);*
- *Hyposensitive/Hypo-responsive (Type A distracted-hard to engage);*
- *Hyposensitive/Hypo-responsive (type B self-centred);*
- *Impulsive looking for sensory stimulation.*

For the diagnostic classification DC:0–5 we include among the main disorders of sensory processing regulation:

- *Sensory Hyperresponsiveness Disorder;*
- *Sensory Hyporesponsiveness Disorder;*
- *Other Sensory Processing Disorder.*

Sleep-Wake Regulation Disorders for the Diagnostic Classification DC:0–3 are reported:

- *Sleep Behaviour Disorder;*
- *Falling Asleep Disorder;*
- *Night Waking Disorder.*

The Diagnostic Classification DC:0–5 adds:

- *Partial Arousal Sleep Disorder;*
- *Childhood Nightmare Disorder.*

Regulation Disorders in relation to Anxiety Disorders for the Diagnostic Classification DC:0–3 are reported:

- *Separation Anxiety Disorder;*
- *Generalised Anxiety Disorder;*
- *Social Phobia.*

The Diagnostic Classification DC:0–5 adds to DC:0–3:

- *Selective Mutism;*
- *Inhibition to Novelty Disorder;*

- *Other Childhood Anxiety Disorder*

Eating Regulation Disorders for the Diagnostic Classification DC:0–3 are reported:

- *Feeding Disorder Related to Regulatory Status;*
- *Feeding Disorder Related to Caregiver-Child Reciprocity;*
- *Childhood Anorexia;*
- *Sensory Aversion to Food;*
- *Eating Disorder associated with co-existing medical conditions;*
- *Eating Disorder associated with insults of the gastrointestinal tract.*

The Diagnostic Classification DC:0–5 adds to DC:0–3:

- *Hyper-Eating Disorder;*
- *Hypo-Eating Disorder;*
- *Atypical Eating Disorder.*

Mood Regulation Disorders for the Diagnostic Classification DC:0–3 are reported:

- *Childhood Depression;*
- *Major Depression;*
- *Depressive Disorder NOS.*

In the Diagnostic Classification DC:0–5, there is a transition into:

- *Depressive Disorder of Childhood;*
- *Other childhood mood disorders;*
- *Anger and aggression dysregulation disorder of childhood.*

This disorder may later evolve into:

- *Conduct Disorder;*
- *Oppositional Defiant Disorder (ODD);*
- *Disruptive Behaviour Disorder or irritability.*

Regulation Disorders in attachment and adaptation for both Classifications DC:0–3 and DC:0–5 are reported:

- *Adjustment Disorder.*

While only for DC:0–5 there is present:

- *Reactive Attachment Disorder.*

Regulation Disorders in affective and relationship disorders for Classification DC:0–3:

- *Relationship and Communication disorder;*
- *Regulation Disorder in Affective Disorders.*

While only for DC:0–5 there is:

- *Childhood Specific Relationship Disorder.*

Disorders of Regulation in Multisystemic Developmental Disorders (DC:0–3) or Neurodevelopmental Disorders:

- *Autism Spectrum Disorder (ASD);*
- *Attention Deficit/Hyperactivity Disorder (ADD/ADHD);*
- *Developmental Coordination Disorder (DCD).*

4. Rehabilitative conclusion and setting

The Regulation Disorder, because of the mistake in attunement and the lack of recovery of it, generates in the child conditions of strong frustration both towards the environment in which he lives and especially towards his parents. In fact, *the term “regulation” indicates, in a very general way, the child’s ability to adapt to environmental requests in ways that respond to contextually defined expectations. This capacity depends on a series of variables that can be schematically ascribed to three categories:*

- *the threshold of sensory receptors responsible for collecting environmental stimuli;*
- *The efficiency of the central control processes in charge of stimulus processing;*
- *The modulation of affective states activated by different stimuli.*

It is necessary to consider the transversality of the construct in every phase of any subject’s life, and in developmental age, it is precisely the condition that assumes an important adaptive value in the process of cognitive and emotional growth. From the perspective of therapeutic treatment, it is crucial to remember not only the extreme precocity onset of the RD but also the frequent alterations in regulation skills that may be seen in distinct nosographic images.

In rehabilitation, this disorder, as far as the treatment of the child is concerned, has a strong “*habilitative*” connotation, since the aim is to create new capacities in the child, who experiences and has experienced the difficulty of being able to tune in with the Other.

The “*re-habilitative*” connotation is aimed at the parent, who is *disorganised*, *unregulated/untuned* to the specific requests of the child and in the most extreme situation *disturbed* in reading and experiencing the relationship itself.

In any sort of treatment, it is effective to rely on Therapists who use the reading and the conducting of the treatment in an integrated manner. A good therapist must be able to balance the needs of the child, which must be focused on experimenting with a new attunement of affections; and the delicate nature of working with the parent, who must be able to recognise and become aware of his attunement challenges with the child, and then gradually succeed in re-entering into an appropriate relationship with the therapist’s assistance.

The main objectives of the initial phases of treatment are:

- the *Quality of the Interaction* between therapist and child is aimed at encouraging the stimulation of potential areas of development and supporting the integrative processes necessary for self-regulation;
- The *Profile Building, Monitoring and Checking* of the child’s growth path.

The rehabilitation process aims at the condition of regulation “from the outside” facilitated by the therapist to allow the child to progressively access self-regulation and subsequently, at the mentalisation of affective states as a premise for the realisation of full awareness of the Self. The therapeutic approach favoured in the developmental age to act on regulation is *bottom-up*; the regulation of affection is mediated by the bodily dimension, to try to create a stabilisation of a relationship that evolves on a tonic, postural, spatial, temporal, and motor level, experienced especially in the sensorimotor setting, where a form of implicit communication takes place.

Furthermore, a *top-down* dialogic and reflexive approach should not be neglected, which is not universally applicable in developmental rehabilitation. Therapeutic change first passes through the implicit and automatic dimensions and then reaches the conscious, reflexive, and verbal processes.

To be able to objectively and congruously define a developmental disorder, it is necessary to define the child’s Functional Profile, which will allow the formulation of the Rehabilitation Project. This last comes with specific short-medium and long-term objectives, to which the use of strategies and facilitations will be added; this will make it possible to achieve the objectives specified for a particular treatment.

The functional profile defines the characteristics of the disorder for which the child is being observed, but also outlines the child’s areas of strengths and weaknesses in all functional areas, taking into account the peculiarities of his significant environment. For the definition of the functional profile there are two fundamental moments:

- The *evaluation*, extended from the disorder to the child and more generally to the context. It is a process of knowledge, which also involves the adoption of specific assessment tools;
- The *translation* of the elements that emerge from the assessment into codified categories (ICF codes) so that they can be transferred to a notation sheet that can be read instantly by all the members of the rehabilitation team. The team can identify the therapy goals thanks to the functional profile.

The therapist's approach must be in accordance with the WHO's (World Health Organisation) proposed Bio-Psycho-Social model, according to which the subject's assessment must also thoroughly examine all the *Personal* and *Environmental Factors* that support the realisation of their activities and participation, in addition to factors related to *Body Functions and Structures*.

The rehabilitative intervention is composed through the activities of:

- *Functional assessment of the child*. It is implemented through standardised procedures and tools, to start a cross-sectional knowledge process that defines the child and his development within the context of his living environment. The purpose of the functioning assessment is to determine the child's overall functioning, which includes areas of strength and weakness, as well as personal and environmental traits that may promote or obstruct the child's growth.

- *Identification of the objectives*. Once the functional profile has been defined, objectives are identified in relation to the real needs of that individual child, in that personal developmental phase, and in that specific environmental context. The choice of the objectives must be functional to the realisation of a specific and generalisable rehabilitation project, aimed at favouring the child's growth as an individual which is known and shared by all the operators, who with different capacities and with different modalities and professionalism, intervene to realise it. This principle envisages multidisciplinary work aimed at overcoming the self-referentiality of individual operators;
- *Choice of the most suitable strategies for achieving the identified goals*. This phase also follows directly from the child's functional profile, which helps us to understand and suggest which contexts, approach modes, play proposals, and characteristics of activities are most congenial to the child and which, as such, guarantee his more immediate and complete involvement;
- *Checking the results against the objectives previously identified*. This is the phase in which the reliability of the assessment is carried out, the suitability of the objectives identified and the validity of the strategies adopted to achieve them are verified. It is important to constantly update the checking phase, due to the not-always-cyclical course of the developmental age. This makes it possible to reformulate the rehabilitative programme according to the child's needs at a given time.

The concept of an *interactive profile*, which results from the articulation between the observational-interactive function and the evaluative function (comparison of typical and atypical development) is particularly significant in choosing and identification of objectives (introduction of facilitators, which makes the observation of emerging competencies possible).

The definition of an interactive profile allows one to identify the child's expressive traits, situate them in the area of potential development, and specify the therapy goals, and intervention plan. Regarding the nosographic classification in which the subject is placed, the functional assessment of the subject assumes a predominating role. Therapeutic work is not centred on the disorder but rather on the functions and aims to develop effective strategies with the residual resources so that the subject can live in his life context more adaptively. After the functioning profile and therapeutic goals have been established, the course of treatment is outlined specifically for each.

Neuro and psychomotor therapy of developmental age (TNPEE, Ministerial Decree no. 56 of 17 January 1997) [17] consist of rehabilitative (but also habilitative and preventive) interventions in all kinds of neurological, neuropsychological, and psychopathological disorders of the developmental age. The TNPEE is in charge of a subject that is still being built, thus it is important to understand and acquire personal ways of reading and perceiving events, a matrix of manifest behaviour, self-regulation strategies, and individual reactive modes that point to hetero-regulatory abilities. The work always starts from the areas previously identified as zones of proximal development; this strengthens the relationship and the sense of self-efficacy within a therapeutic setting that is safe and predictable and where the child can experience himself in the motor, physical, cognitive, and emotional dimensions. The therapeutic relationship is always a privileged goal, implicit, and intrinsic in the treatment: it is in fact the engine of changes, as well as a solid base on which to live effective therapeutic experiences. The TNPEE is the child's emotional and physical container, the mirror in which the child's actions are reflected, the external regulator, and the source of security from which the child draws in the therapeutic context. The TNPEE has a plastic and flexible personality, which modulates his modes of interaction in relation to the subject in front of him so that he can embody this ideal of trust and can act as external support to build and generalise effective self and hetero-regulation skills. In the therapeutic relationship, moments of conflict and mismatching will also be necessary to be effective: these are moments in which the threshold of the child's window of tolerance is tested and an attempt is made to go beyond it and then to bring the subject back to a condition of homeostatic balance through strategies to built together and then generalise in significant living environments. The therapeutic intervention takes place, mainly, within a peculiar setting dimension, which due to its intrinsic characteristics, acts as a promoter in the organisation of the therapeutic experience of the patient and the dyad it forms with the TNPEE. The term setting etymologically derives from the verb “to set” translated as “to arrange, place, establish, stage”. In the “-ing” form it is translated as the frame, the scenario, and the environment within which the action takes place. The first meaning encompasses the concept of the normative dimension of the setting, which refers to the definition of times and places in which the therapeutic session takes place, thus identifying not only emotional and representative boundaries for the patient but also organisational and managerial boundaries concerning the parental figures. The second meaning refers to the organisational aspects of the setting: a defined space and time acquire unique meanings from patient to patient in the way they are managed and organised. The setting of neuropsychomotor therapy can be analysed both in its temporal and spatial dimensions; from the temporal point of view, the therapy, which typically has a duration of 45–50 minutes appears to be marked by four main times: reception time, the time reserved for sensorimotor activities, time for structured activities, and time for the therapy concluding synthesis. The time scansion is not equal, but the longest times are, of course, those dedicated to the actual activities; as much as shorter, the time dedicated to the beginning and the end of the therapy has an important significance, as the subject experiences the therapy sessions with continuity and he can resume and reintroduce matured contents and at the end of the therapy will always come out newly reconstituted. The temporal scansion is then fully reflected in the spatial one; the first and the last therapy time tend to take place on a bench next to the room door. It is an intimate but foundational social moment. The time devoted to the sensorimotor space is spent in a dedicated space, which tends to be jointly organised between TNPEE and the child. It is the time when one fully experiences one's own bodily and

tonic dimension, in a condition of fusion and physical investment. The child can see in the TNPEE his physical and emotional container and at the same time, the TNPEE fully supports all the expressive indexes, emotional elaborations, and cognitive and symbolic representations that the child elaborates, supporting, in particular, the harmonious development of social, communicative, motor, and cognitive skills. This is the space dedicated to pillows, balls and mats, which can be organised, structured, and deconstructed according to the patient's needs. Once this time is completed, the physical setting is rearranged, since clarity and legibility are necessary for the final purposes of it. In the structured space, which typically contains chairs, tables, and cabinets the child is reconstituted, focusing on the implementation of neuropsychological, cognitive, and communicative skills. The therapeutic relationship thus knows a new aspect. And also, the continuity of the dyad in different environments and activities allows the child to discover the other and himself in different dimensions. The final moment has an imposing regulatory potential in the global reading of the therapeutic session. The circle that closes is necessary to settle every interpretation, the lived experiences take on full meaning. Together with the rehabilitative intervention "aimed" at the child, it is not disregarded the *Active Involvement of the Parents* in treatment. Parents must be involved in both the planning and implementation phases of the intervention, to make them active partners and not consider them passive referents, bearing in mind the characteristics of the parental couple and the socio-cultural context.

The intervention for parents is also highly individualised and includes the following phases:

- Definition and individuation of needs and resources (*observational/assessment phase*);
- Identification and sharing of the intervention (*phase of the programme*);
- Evaluation of the change (*verification phase*);

Intervention with parents involves:

- Gathering and documenting information from various life contexts;
- Access to a common understanding of skills and difficulties;
- Focusing attention on resources rather than weaknesses.

The tools used to achieve these objectives are interviews, administration of questionnaires, viewing family films, viewing filmed therapy sequences and/or observation through a one-way mirror, and joint play sessions.

The importance of avoiding an attitude of "*educational palsy*" from the parents and the consequent tendency to observe the "*delegating*" problems solving to experts, is an attitude that must be discouraged from the outset, seeking to restore the parent's sense of competence and effectiveness.

It is necessary to progressively reorganise a system in which the parents' role is critical and decisive for the child's development. Often, experiences of inadequacy and incompetence in managing difficulties may emerge in parents, so it is appropriate to provide some general suggestions, namely:

- Place stimulation in the child’s area of potential development and never on the deficient area, to avoid increasing the sense of ineffectiveness that is already naturally inherent in the condition;
- Maintain, while involving the family, the specificity of contexts, roles, and strategies, as the risks associated with “treated” family and/or educational environments are well known.
- Articulate the activation of stimulation areas in the family and/or the educational environment according to the child’s actual developmental profile by providing:
 - opening play areas of intersubjectivity adapted to the child’s specific interactive profile;
 - identification of educational strategies aimed at the harmonisation of the child’s rhythms and the evolution of adaptive capacities and the related tonic, postural, and motor structure;
 - The organisation of sensory experiences adapted to the child’s neuropsychological profile.

All this translates into an integrated system of collaboration and help, which is articulated in an enabling model that pays attention to the subjects, the contexts involved, and the strategies [18].

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References

- [1] Hill D. Teoria della Regolazione Affettiva. Un Modello Clinico. Milano: Raffaello Cortina Editore; 2017
- [2] Siegel DJ. La Mente Relazionale. Raffaello Cortina Editore (Milano): Neurobiologia dell'esperienza interpersonale – III Edizione; 2021
- [3] Freud S. Al di là del principio del piacere. Bollati Boringhieri (Torino). 1980
- [4] Erikson EH. Gioventù e crisi d'identità – XII Edizione. Armando Editore (Roma). 1995
- [5] Bowlby J. Attaccamento e Perdita. Bollati Boringhieri (Torino): L'Attaccamento alla Madre; 1999
- [6] Sander LW. The regulation of exchange in the infant-caretaker system and some aspect of the context-content relationship. In: Lewis M, Rosenblum L, editors. Interaction, Conversation, and the Development of Language. New York: Wiley; 1977
- [7] Beebe B, Lachmann FM. Infant Research e trattamento degli adulti. Raffaello Cortina Editore: Un modello sistemico-diadico delle interazioni; 2003
- [8] Stern D. Il mondo interpersonale del bambino. Bollati Boringhieri (Torino). 1987
- [9] Trevarthen C. Intrinsic motives for companionship in understanding: Their origin, development, and significance for infant mental health. *Infant Mental Health Journal*. 2001
- [10] Trevarthen C. Infant intersubjectivity: Research, theory and clinical applications. *Journal of Child Psychology and Psychiatry*. 2001
- [11] Singer T, Hein G. Human empathy through the lens of psychology and social neuroscience. In: DE WAAL FBM, Ferrar PF. editors. *The Primate Mind*. Cambridge, MA: Harvard University Press; 2012. pp. 158-174
- [12] Premack D, Woodruff G. Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*. 1978; 1(4):515-526
- [13] Manenti A. *Intersoggettività*, TreDimensioni, 2006
- [14] Tronick E, Als H, Adamson LB, Wise S, Brazelton TB. The infant's response to entrapment between contradictory messages in face-to-face interaction. In *Journal of the American Academy of Child Psychiatry*, Milano. 1978;17:1-13
- [15] Tronick E. *Regolazione Emotiva, nello Sviluppo e nel Processo Terapeutico*. Raffaello Cortina Editore; 2008
- [16] Greenspan SI. *Infancy and early childhood: The practice of clinical assessment and intervention with emotional and developmental challenges*. Inc: International Universities Press; 1992
- [17] Regolamento concernente la individuazione della figura e relativo profilo professionale del terapeuta della neuro e psicomotricità dell'età evolutiva. (GU Serie Generale n.61 del 14-03-1997) [Internet]. *Gazzetta Ufficiale*. Ministero della sanità; 1997 [cited 2023 Jan 31]. Available from: <https://www.gazzettaufficiale.it/eli/id/1997/03/14/097G0084/sg>
- [18] Gison G, Bonifacio A, Minghelli E. *Autismo e Psicomotricità*. Trento: Erickson, ristampa; 2016