Parents-children co-regulation as therapeutic variable and target in autism spectrum disorders. From observation of drive to need of cooperative parent-mediated therapy

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Abstract

Autism spectrum disorders (ASDs) belong to the category of neurodevelopmental disorders. ASD emerges in early childhood and involves deficits in communication, language, behavioural inflexibility and fixity, and sensorial neurodivergent perception. ASDs have a biological pathogenesis related to genetic and epigenetic factors.

Additionally, research has shown that starting from childhood, autistic persons could find emotional regulation challenging during communication with caregivers.

The importance of emotional co-regulation has always been underlined in psychology, starting with Freud who introduced the concept of the Compassionate Other.

Emotional difficulties are grasped immediately and almost instinctively by parents, who try to modulate their approach to the child’s needs from the very beginning.

This paper seeks to highlight the importance of emotional co-regulation as a wake-up call-in developmental trajectories that present peculiarities or anomalies. It also emphasizes the significance of emotional co-regulation as a useful tool for intervening in the dysfunctionality of such trajectories. This intervention aims to directly involve parents in treatment, as seen in Cooperative parent-mediated therapy. This approach is crucial for facilitating the evolution of the cognitive framework while utilizing this target.

This article aims to review the most recent literature on co-regulation after explaining the theoretical framework that gave rise to this concept.

It’s now well established the importance of adopting a developmental approach that starts from the bodily dimension as the basis for the relationship with caregivers, pairs, and unfamiliar people.

It is from this basis that starts the affective, emotional, and cognitive construction of the internal and external world of the child.

This scoping review takes into account the most recent evidence on co-regulation and autism, emphasizing the importance of this process in diagnostic and therapeutic settings.

Introduction

Autism spectrum disorders (ASDs) are neurodevelopmental disorders with early childhood onset. ASDs have a biological pathogenesis, related to genetic and epigenetic factors. ASD diagnosis presents characteristics like deficits in social communication, restrictive/repetitive behavioural patterns, and language difficulties that may also involve difficulties in understanding metalanguage as understanding metaphors, irony, and jokes, with specific difficulties in executive functions. Moreover, patients with ASD diagnosis can have difficulties expressing and regulating emotions. Autism was considered rare until a few decades ago, whereas nowadays is very frequent and the percentage of the population with this diagnosis seems to be steadily increasing. Since its first recognition in 1940s by Leo Kanner and Hans Asperger, the importance of early diagnosis in childhood was emphasized, underlining from the very beginning the difficulties the infant faces in interacting with the external environment and caregivers. Even though parents don’t have a pathogenetic role connected to their mothering ability, the relationship with a child that has an emotional and communication deficit could interfere with the parents-children’s co-regulation. Therefore, one of the first concepts investigated was the parent-child relationship. According with the cultural change in the family structure, that lead to a condition of equality between parental roles, we will refer to the caregiver-child relationship, and how the child builds his/her internal and external world representation thanks to this primary relationship. Starting from Thompson’s definition (3-4), developed in the 1990s, regulation has advanced as a necessary mechanism for the infant’s internal and external world processes. However, Freud had already emphasized the importance of the Mother Figure and Compassionate Other during the infant’s regulation processes, theorizing a specific point called the “third time of the drive/impulse.” This Freudian concept, at a later stage, has found great ap-
plification in the field of neurodiversity. At present, the role of mothers in facilitating children’s emotional development is widely recognized, as they support, sustain, and model emotional understanding, expression, and regulation. Mothers can play a particularly crucial role in this process when their child has a disorder, such as autism, that is characterized by delayed or deviant patterns of emotional development (5). This different emotional pathway can be seen from the “Broken Mirror theory” in autism, which outlined how children could have difficulties in recognizing caregiver and self-emotions and also in building the co-regulation and the caregiver-infant relationship (6).

It's now well established how important is the adoption of a developmental approach that starts from the bodily dimension as the basis for the relationship with the world and the caregivers. From this base it begins the affective, emotional and cognitive construction of the child’s internal and external world. Therefore, the body and the early relationship with the caregiver seem to be the first keys to an early evaluation and intervention where the child’s developmental trajectory presents atypicality (7). Clinical and research seem to be consistent in demonstrating that knowledge is a process that starts from the body and reaches the mental dimension, in what appears to be a co-construction (8). In summary, research has given scientific validity to the Aristotelian construct of “Nihil est in intellectu quod prius non fuerit in sensu”. In children with autism, there is a tangible disruption or even a setback in skills related to communication, language, imitation, and many sensorial and emotional processing (9). The psychodynamic approach has always emphasised a person’s way of experiencing the body, underlining the difficulties that a child may face in synthesizing and giving meaning to the internal and external world. In this field, Kanner (10) was the first that described children’s impairment in affective contact with other people as the heart of autism. Difficulties in engaging with others remain the salient feature of autism from early stages to adulthood (11-12). These impairments characterise the autistic individuals throughout their lives (13-14). Direct observations of infants (15) and retrospective parent reports (16) have shown that difficulties in eye contact, turn-taking, and joint attention arise from early childhood. Therefore, the signs of an atypical developmental trajectory can be early identified in the physical and emotional relationship with the others.

**Third time of the drive in freud’s theory**

In the research and clinical area, neurodiversity aims to find the standards to detect the onset of diseases or severe conditions at an early stage before the nosographical framework becomes established. This is a necessary endeavour since the discovery that the lack of stimulation of the neuronal apparatus leads to a loss of functionality of certain neuronal circuits (17). This intervention would avoid the chronicity of some processes the reactivation of some structures in the course of the constitution (18). Therefore, the construct of the third time of the drive can be helpful to notice the atypical signs as soon as possible to intervene effectively. In 1915 Freud elaborated the concept of the drive, but he specified that it was worth further reworking. The drive would be the psychic representative of the excitations that come from inside the body. The relationship between the newborn and the caregiver has always interested neurology and psychology. Freud’s often overlooked yet significant contribution could hold great potential for the early detection of autism and other disorders. In the Project, Freud affirms that the human being, from the first moments of life, tends to maintain homeostasis, avoiding everything that can be unpleasant. The infant cannot achieve homeostasis in autonomy and solitude. To stop the internal excitement and the consequent unpleasant sensation, the individual requires the presence of someone that Freud defines as ‘a compassionate Other.’ This role is generally played by the mother but is more broadly assigned to caregivers. The compassionate Other manages to make sense of the infant’s endogenous excitement and remove unpleasant sensations from the external or internal world (hunger, sleep, thirst) (19). Freud’s conception seems to outline the role of a caring Other capable of structuring the organization of the child’s internal world. The process by which the caring Other regulates the child’s homeostasis is based on the body. The child communicates with the caregiver using the body, voice, and gaze, responding through the same channels. In the Project, Freud describes the three times of the drive, highlighting the first active time when an infant moves towards an external object. The second reflexive time is when the infant takes as an object a part of their own body. In the third passive time, the infant makes himself/herself the object of another. For example, in a play scenario, the mother bites the baby’s little foot, and in response, the baby offers the foot to the mother to continue the game, showcasing the reciprocal interaction. This reciprocity is often compromised in a caregiver-child dyad when the latter is affected by autism. Autistic children, for example, do not produce movements aimed at being kissed, seen, or heard. The caregiver’s attempts to interact with the newborn may be perceived as intrusive by the autistic baby. As a result, the autistic baby perceives the stimulus but fails to engage in the communicative ping-pong of looks, vocalizations, and movements with the caregiver, which is necessary for constructing the internal and external world of the child.

**CO-Regulation**

Before we explore the current research on co-regulation, it is crucial to provide an overview of the historical context and the most significant contributions of this concept within the developmental framework. This approach examines the body’s central role in the process of proximal development, signifying the transition from one developmental stage to the next. During the first months, the child identifies a specific attachment figure, based on the quality and consistency of the care received. Specifically, the support of this figure exerts a specific influence on the child’s areas of well-being and development at a cerebral level (20-21). During the conversation between the parents and the children, there is a modulation and an adjustment of voices and vocalisations of each in a variety of qualities. This step anticipates and regulates the cycle of emotions. In fact, by using voice properly, the child activates and engages closer people, forming
a more effective and psychologically meaningful internal representation of external dimensions. Draghi-Lorenz (22) reviewed the children’s emotional development theory and divided emotions into Basic and non-Basic emotions. Basic emotions are developed in early childhood and non-Basic ones appear from the second year onwards. Furthermore, the theory suggests how basic emotions in the infant are reactive states provoked by stimuli. This hypothesis highlights the cognitive complexity of interpersonal experience and social skills required to develop the second set of child’s emotions. Therefore, also the latest neuroscience research suggests how knowledge is shown to be developed first in the body and then progressively reaches a mental dimension. Although the aetiology genetics is multifactorial, arrests in some areas of development, deficits in imitation, and sensory distortions are observed in all autistic children, albeit at different levels, with a spillover of these peculiarities at the ideational and cognitive levels (23). More recently, Damasio (24) has shown that the cognitive and emotional spheres are built in stages and through the encounter between the child’s inner and outer worlds. However, the self is also constructed in this way. Gaddini (25) pointed out that in the first weeks of life, the baby’s perception of the external world goes through a series of bodily modifications. The first behaviors enacted by the baby are purely imitative, therefore, imitation is a precursor of the processes of adaptation of the ego and, in the first stage is used by the child to perceive/learn and, while in the second stage, to be. During this stage, it is essential that the child clings, in the Winnicottian sense (26) of the term, to the emotional dimension of the mother. Through the tonic dialogue (27–28) between mother and child, the child will develop the skills. Emotional involvement in the dyad is also crucial for the repetition of those simple gestures, such as tongue protrusion, that were previously seen only through an intra-individual perspective (29). However, this “dance for two,” as other studies on prenatal life point out, is nothing more than the continuation of a rhythm already established during pregnancy. Trevarthen (30) coined the term “sinus rhythm” to refer to the dialogue that exists between mother and child during pregnancy. Some academics have tried to explain what the blocks to this atonement might be. For example, Tustin has pointed out that, in absence of a transitional object as meant by Winnicott, autistic children at the moment of separation from their mothers begin activities of self-stimulation instead of activating imagination, thought and play (31). In atypical development, objects are not held or exchanged within a game that helps the child to form fantasies, illusions, and thoughts. The object for the autistic person is held, not separated, so much that Tustin names these objects as “Autistic Sensation Objects” (32), used as anti-separation objects, operated to plug and not evoke separation from the other. This mechanism has been described by Donald Meltzer (33) as defensive mechanisms related to the body through the concepts of sensory dismantling and adhesive identification, stressing that the autistic child has a form of primitive permeability which makes him extremely vulnerable to the outside world. The author pointed out that autistic persons can perceive information from the world as a “bombardment”, a sensory overload. By displacing incoming information, including sensory information, the autistic person can dampen the intrusiveness of information from the outside. Recently, Smith (34), with his empathy imbalance hypothesis, continued the strand of studies that emphasises how the autistic person enacts a series of rigid and stereotyped behaviors to modulate the stimuli from the external and internal world.

**Method and materials**

In this review, the literature about co-regulation and autism was searched across a major scientific database. Scoping reviews serve as valuable tools to provide an overview of emerging topics. The search team conducted a search on the PubMed electronic database for articles published within the last 10 years, meeting the following criteria: relevance to co-regulation and autism and publication within the last 10 years. Articles that were not original research were excluded. As a result, a final collection of 11 papers was obtained, with only 5 meeting the specified criteria.

**Results**

The results indicate that the link between co-regulation and autism warrants further investigation, despite the robust theoretical constructs that have always emphasized its importance. The methodology, tools employed, and even the specific aspects of co-regulation examined appear to be heterogeneous; however, the research studies arrive at similar conclusions. Fenning et al. (34) selected and investigated a sample of 46 children aged between 4 and 11 years, along with their caregivers. The researchers assessed both autism-related characteristics and cognitive profiles using the SB5 ABIQ (35), ADOS-2(36), and Electrodermal activity (EDA) instruments. They also used the Parental Scaffolding Observation System and Dysregulation Coding System (37). The average IQ of the children fell within the borderline range of intellectual functioning, and 36% of them exhibited IQ scores falling below 76, indicating an intellectual disability (ID). The children participated in a co-regulation task, involving both a dyadic test with their parent where they had to complete a puzzle and an independent regulation test where they faced a frustrating task alone, without the parent’s presence. Both tests lasted 5 minutes. The subjects had a medium to severe level of symptom severity, as assessed by ADOS-2. The study’s results aligned with expectations, revealing that autistic participants encountered greater difficulty in emotion regulation during the “independent” test compared to the dyadic test. Additionally, the study observed that higher levels of symptom severity correlated with increased emotional dysregulation during the test. Interestingly, factors such as ethnicity, gender, and marital status did not influence emotional dysregulation. Victoria Ting and Jonathan A. Weiss (38) explored emotion regulation and parent co-regulation in a sample of 48 children aged 8 to 12 years. 77% of the included subjects had mothers with a mean age of 44.09 years. The sample comprised individuals with a well-established diagnosis, an IQ greater than 79, a willingness to participate in research, and a commitment to 10 weekly therapy sessions. The assessment tools used included the Autism Diagnostic Observation
risks of feeding difficulties are very common among ASD children. In this study, the authors employed instruments previously validated with mothers of typically developing children (45) and children with ASD (46) in the Emotion Discussion Task (47). This task involved dyads discussing three emotions (anxiety, anger, and happiness). The authors also measured internalization and externalization problems (48–49). The researchers identified three modes of caregiver co-regulation: vocal (predominantly using reassurance and vocal messages), active (offering physical comfort, prompting, and redirecting attention), and following (tracking the child’s emotions and intentions). As theorized, the most frequently used strategies were active and following. Regarding gender differences among caregivers, mothers demonstrated greater physical comfort and employed the active strategy more often than fathers. Autism severity was found to be correlated with internalization problems, while parental scaffolding skills were linked to children’s externalization problems. Baker (50) reinterpreted Fenning’s data, emphasizing co-regulation as a driver of cognitive maturation. Baker suggested that dysregulation in children becomes more pronounced with age. Furthermore, a deeper interpretation of Fenning’s data highlighted the role of co-regulation in aiding the cognitive maturation process, potentially facilitating certain skill recovery even in children with ASD. In a sample of children ranging from 4 to 11 years, a higher child age was associated with an increased consistency in dysregulation scores across parent-child and independent contexts, along with a stronger inverse relation between parent scaffolding quality and children’s independent dysregulation. This effect was not replicated using children’s mental age as a substitute for chronological age, suggesting that exposure over time to parental support may account for these associations, rather than mere cognitive maturation. Evidence of greater correspondence between externally supported and autonomous regulatory quality with age suggests that processes of internalization, as conceptualized for children with typical development, may take on a similar form for children with ASD. However, while an increased inverse association between parental scaffolding and children’s independent dysregulation was observed as a function of higher child age, this association only reached the level of a trend, even when estimated at one standard deviation above the mean age (approximately 8.81 years). This trajectory suggests that the independent regulation abilities of children with ASD may eventually demonstrate some concordance with the quality of parent co-regulatory support, but that this process substantially lags compared to expectations for children with typical development, perhaps not occurring until much later in middle childhood. Catino et al. (51) examined feeding problems in the context of mother-child co-regulation; this type of problem is very common among ASD children. In this study, the authors observed and analysed the feeding problems of children with autism and the co-regulation strategies of their mothers. The sample consisted of 60 families with children diagnosed with ASD or at “high risk” for autism and 50 families of physiological developing children. 49 males and 11 females aged between 18 and 48 months were included in the research; the children had to be diagnosed of autism according to DSM-5 criteria. The researchers used the following instruments: ADOS-2 (52), Leiter International Performance Test-Revised (Leiter-R) (53) or Griffiths Mental Developmental ScaleExtend Revised (GMDS-ER) (54), the mother-child dyad was analysed using an Italian adaptation of the Feeding Scale - Scale for the Assessment of Feeding Interaction (55), which can be applied to children aged between 1 and 36 months, the children’s feeding difficulties were investigated using a parental report questionnaire, the BAMBI (56). The results showed greater difficulties at mealtimes on the arm of autistic children, who showed gestures that were not always aimed at a purpose and greater attention to objects rather than to people; the appearance of stereotypies also makes mealtimes more complicated, affecting interactions with the caregiver. On their part, the mothers of ASD children showed higher scores in the SIVA area called ‘dimensions of interactional conflict, with greater difficulties in expressing positive feelings and interpreting children’s needs. Hobson et al. (57) conducted a study which represents a partial replication and further extension of the study conducted by Beukens and colleagues (58), who studied a diverse sample of 25 parent-child dyads comprising children with autism aged between 4 and 14 years. The measures used within the methodology included ADOS-2, Dyadic Coding Scales (59), Co-Regulation and Intersubjective Engagement, and processes targeted by the therapeutic approach of Relationship Development Intervention (RDI) (60). The authors examined the child-caregiver relationship during a period of structured interaction, with a focus on the relationship between autism severity and the quality of the child-caregiver interaction. They studied these variables at two points in time in children receiving a treatment focused on social engagement, the Relationship Development Intervention (RDI). Hobson’s sample included 18 parent-child dyads in which the child (16 boys, 2 girls) had a diagnosis of autism and was between 2 and 12 years old, and their caregivers (16 mothers, 2 fathers). Videotapes of parent-child interaction at baseline and after treatment were evaluated by independent coders. The results showed that the low quality of child-caregiver interaction was related to autism severity. The ratings on each of these variables changed throughout treatment, and it was shown that the improvement was specifically related to the quality of parent-child interaction at baseline. This study found that a good parent-child relationship score was predictive of positive changes during the intervention, whereas dyads with lower functioning may need more input before seeing benefits in children.

Co-regulation and clinical applications. the example of cooperative parent-mediated therapy

The scientific literature has unanimously stressed the importance of parent-child co-regulation for both early diagnosis and intervention in cases of atypical and/or autistic child development. On this clear and specific theoretical basis, Parent Mediated Therapy (PMT) interventions were
set up, in which a professional trains the child’s parents to harness their motivation, insight, and skills to promote their child’s abilities (61). A professional then trains parents to implement their skills at home and in the places usually frequented by the child (62). The most studied and rigorous models to date in methodology, turn out to be ESDM, JASPER, and PACT (63). The hours that are required for adequate parental preparation appear to be a variable related to the type of intervention chosen and the institution of fruition, which can be as high as 48 hours in two years. Although this figure takes a back seat to the benefits the child would derive from a PMT, it needs to be taken into account since not all parents may be psychologically ready, willing, and with the right financial resources to train within 48 hours in two years. For example, even though this type of intervention involves a specific pairing of therapist and parent, parents still feel overwhelmed and face a very difficult challenge (64). In Italy, parent-mediated cooperative therapy (CPMT; 65), a parent coaching program already adopted in the National Health System’s Child and Adolescent Mental Health Services, is used. More recently, CPMT has also been implemented at the Child Neuropsychiatry Units of the Bambino Gesù Children’s Hospital. The basis of this intervention is the elicitation of interaction and cooperation (66), as well as the Naturalistic Developmental Behavioral Interventions (NDBI) perspective. CPMT guides parents in implementing specific skills of their children: social-emotional engagement, emotional regulation, imitation, communication, joint attention, cognitive play and flexibility, and cooperative interaction. Like other parent-mediated interventions, the CPMT notes with the therapist the child’s initial level and drafts the various short-term goals to be achieved. Parents, together with their child, attend six months of therapy, for a total of 15 one-hour meetings. CPMT promotes the active involvement of parents, supported by the therapist. The therapist teaches parents specific techniques that they can use to pursue the goals set together. Another important aspect of this intervention is the feedback that parents receive both during parent-child sessions and in five specific meetings. At the end of each session, parents receive a memo and specific activities to do at home. A key point for the application of a good PMT model is the therapist-parent alliance: The effectiveness of strategy implementation increases with a more positive alliance. Another positive note for parents is the implementation of well-defined goals: one step at a time. Usually, the first few months of work focus on acquisitions such as name response, use of gaze, joint attention, and functional play. However, whatever intervention methodology is preferred, these goals depend on the assessment that the therapist and parents will make of the child’s abilities at the beginning of treatment. Parents also described that the interventions had direct benefits on their child, with improvement in his or her behaviour. This improvement was noted in verbal and nonverbal communication, repetitive behaviour, and challenging behaviour (67), but the results appear to be closely related to the individual characteristics of the parents and the child (68).

Discussion

Research on co-regulation helps to have a broader view not only of dyadic caregiver-child functioning but also of autism. All the research, in fact, both with preschool children and with older children, shows how the interactive style of the dyad is predictive of the level of autism and the development of autism over time (69). All the selected papers don’t show differences based on the gender of the caregiver but highlighted how the co-regulation is calibrated by the caregiver according to the needs of the child from the beginning. Gulsrud et al. (70) noted that mothers of young children with ASD mainly used more active and physical co-regulation strategies, rather than those that were more passive and less responsive to the child’s developmental needs. Considering the role of exercise and cytokines on pathological and non-pathological people (71-73), it would be useful to investigate their influence on the development of coregulation in childhood. It is as if mothers were able to intuitively grasp their children’s difficulties much before a diagnosis. Combining active and passive co-regulation strategies with school-age children with ASD may be more useful, as prompting helps guide the child’s emotional experience while following emotions helps the child internalise adaptive emotion regulation skills (74). As Hoffman (75) argues, providing both structure and freedom can create a context that is “rather but not overly exciting, and thus better for instilling emotional growth”. This can be especially important when parenting a child with ASD, as studies have found that children with ASD have higher basal arousal levels (that is higher heart rate) and an attenuated heart rate response during a social stressor (76). Being able to help children lower their physiological arousal levels can be an important way to cope with environmental stimuli. The efficacy of strategies based on co-regulation studies on parent-child show that a good co-regulation is a valid aid to the treatment of autism. On the opposite, altered co-regulation, which is not fluid, with low reciprocity is an important red flag of autism and, subsequently, of the severity of autism. Co-regulation deficit, therefore, appears to be a predictor of autism and autism severity, as well as an element to work on to improve autistic child’s abilities. Co-regulation is a complex process, requiring a range of skills from both the child and the parent. On the parent’s side, a specific skill is required, called “scaffolding” which taps into parents’ ability to respond sensitively to their child and maintain their child’s persistence toward the task, which is important in children’s emotional development” (77). As already shown before, good scaffolding skills in parents are associated with lower levels of behavioural problems in autistic children (78). If it is possible to predict the behavioural effects of co-regulation difficulties, it is much more difficult to predict the same effects on the child’s internal world. From the various scientific contributions, the quality of parental emotional support is less relevant to a child’s internalizing problems than the child’s knowledge of appropriate emotion regulation strategies. Previous studies have found a similar pattern of results, with parent scaffolding and positive parenting being more strongly associated with child externalizing problems than internalizing problems (79). But it is necessary to remember that several difficulties of the inner world can arise and manifest themselves
in adolescence. Therefore, McCarty and colleagues (80) suggest that the effect of parent scaffolding and emotional support on a child’s internalizing problems may not be seen until later in development. Indeed, it is widely clinically evident that autism is a condition that is compounded by other disorders over the life of the individual. Anxiety and depression are the most common conditions (81), the prevalence seems to vary widely from 14% to 84% for anxiety, and between 17% and 70% for depression (82-83). When anxiety and depression are in comorbidity to the autistic spectrum condition, quality of life tends to decline further, with an increase in sleep disorders (84) and behavioural problems (85). Therefore, good co-regulation seems to be a protective factor against several complications that otherwise arise in autistic people. The importance of a good co-regulation for the developmental trajectory of a person (both in typical such as atypical development), highlights the strong role of interventions to be implemented in a dyadic caregiver-child setting which work not only on autism but also on co-regulation. This observation, which starts from Freud’s theory, includes a biological basis as the broken mirror theory, which could be a building block to stress the need to treat ASDs children as soon as possible involving their parents. Parent-mediated intervention is widely used for preschoolers with autism spectrum disorder (ASD). In Valeri’s cooperative parent-mediated therapy (CPMT) - individual parent coaching program for young children with ASD has been administered to preschool children with ASD. CPMT showed a significant improvement in the primary blinded outcome, socio-communication skills, and some secondary outcomes such as ASD symptom severity, emotional problems and parental stress related to parent-child dysfunctional interaction. No additional benefit was found for language abilities. CPMT provides an additional significant short-term treatment benefit on ASD core symptoms when compared with an active control group receiving only LPI (86).

Conclusion

In conclusion, co-regulation research offers a comprehensive perspective on dyadic caregiver-child interactions and autism. Extensive studies spanning various age groups consistently link interactive styles to autism severity and developmental progress. Gender distinctions among caregivers are less emphasized, with co-regulation finely tuned to individual child needs. Active strategies employed by mothers of young children with ASD underscore innate understanding even before a formal diagnosis. For older children, integrating active and passive co-regulation strategies guides emotional experiences and skill internalization. Balancing structure and freedom aids emotional growth, vital for children with heightened basal arousal. Effective co-regulation strategies serve as potent tools in autism treatment, while disruptions indicate autism severity. Successful co-regulation necessitates child and parent skills, with “scaffolding” pivotal in parental support. Strong co-regulation shields against complications like comorbid anxiety and depression. Early interventions involving parents, backed by the broken mirror theory, are promising. Parent-mediated programs, exemplified by cooperative parent-mediated therapy (CPMT), improve socio-communication, ASD symptoms, and alleviate distress. The intricate interplay between co-regulation, autism, and interventions underscores caregiver-child dynamics’ impact on developmental trajectories and well-being for autistic individuals.

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