



CHAPTER 5

AQUATIC IMMERSION IN EARLY CHILDHOOD: VOLUNTARINESS VS. IMPOSITION

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AQUATIC IMMERSION IN EARLY CHILDHOOD: VOLUNTARINESS vs IMPOSITION

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Immersion at an early age should always be approached voluntarily and through play, avoiding coercive methods. Pleasant experiences promote motor and emotional development and build confidence in the water and in the educator or adult caregiver. On the other hand, forced immersion can generate fear and limit learning, reinforcing the need for a respectful pedagogical approach.

▶▶▶ Introduction

What happens in a child's mind and body when they are submerged without their consent?

This question sparks an ethical and pedagogical debate that pervades early childhood aquatic education: the distinction between **forced immersion**, guided by the adult's will, and **voluntary immersion**, driven by the child's desire and curiosity.

This work aims to reflect on the practice of aquatic immersion in babies and young children from a respectful perspective, considering the neurophysiological, emotional and pedagogical foundations that underpin freedom of action in water.

The analysis is framed within the principles of respect for children's autonomy and dignity, consistent with advances in psychomotor skills and developmental neuroscience. This principle coincides with the **child's right to be heard and to participate in decisions that affect their well-being** (Convention on the Rights of the Child, art. 12), transferred here to the context of aquatic education.

Recognising children as active, competent and sensitive individuals is the starting point for rethinking traditional practices which, under the guise of "teaching them to swim" and preventing drowning, may violate their right to decide about their own bodies and learning pace.

▶▶▶ Context and Aquatic Reflexes in Infants

From the first months of life, babies have innate reflexes related to water: the immersion/diving reflex allows the mouth and airways to close on contact with water (Latorre et al. 2016). Between 2 and 6 months of age, almost all babies have this reflex, so they can submerge without risk of inhaling water. This suggests that physiologically, infants can experience light immersion without immediate danger. However, educational immersion always requires a playful and respectful approach. The literature recommends taking advantage of the baby's natural curiosity and the presence of a reference adult (usually the parent) to make the aquatic environment a playful and bonding experience, in which the child gradually explores without pressure (Moreno-

Murcia & Ruiz, 2019; Sanz, 2017).



According to Hertsgaard et al. (1992), the first pleasant experiences in mother-child swimming classes do not trigger a stress response in babies: they measured salivary cortisol before and after the sessions and found no increase in cortisol after swimming; in fact, post-swimming levels were lower and associated with positive behaviours. This indicates that pleasant aquatic contact does not cause physiological stress in the baby and reinforces pleasant emotions, provided that the experience is safe and without impositions.

➤➤➤ Voluntary Immersion: Benefits and Recommendations

Methodologies based on **voluntary immersion** recognise the child's initiative and the value of play as a natural way of learning. Instead of the adult directing or imposing the aquatic experience, **free exploration** and **motor autonomy** are prioritised. The role of the educator or parent is that of an attentive companion, providing a safe and emotionally available environment.

From the perspective of **free movement education**, developed by **Emmi Pikler (1979)** and taken up by **Beneito (2012)** and **Chokler (2009)**, the baby is an active subject from the beginning of life, capable of organising their actions in relation to their environment and constructing their own learning. Self-initiated movement not only develops motor skills but also generates an **experience of competence and efficacy**, which is the basis for subsequent psychological development. As Pikler points out, children need to "feel in control of their actions," and that sense of competence transforms into confidence and curiosity about the world. In the aquatic environment, this experience translates into spontaneous movements, exploratory glances and autonomous decisions about when and how to come into contact with the water.

Chokler (2009) expands on this approach by stating that to speak of autonomous activity is to recognise that babies are **subjects of action and not of reaction** from the earliest age. For his part, **Beneito (2012)** emphasises that a healthy attachment function should not “lock” the child into dependence, but rather facilitate their openness to the world. **Voluntary immersion** is therefore part of a pedagogy of accompaniment, where the adult supports without invading and trusts in the child's internal competence to decide when, how and how much to explore the water.

Along the same lines, **Langendorfer (2019)** introduces the concept of self-agency, or the child's ability to exercise control over their own actions, including saying “no”. In the aquatic context, this principle involves abandoning “command style” or obedience-centred methods and adopting a pedagogy based on listening and respect. “Letting babies be our teachers,” says Langendorfer, means recognising their physical and emotional wisdom. Allowing children to choose whether or not they want to submerge themselves is a concrete practice of teaching autonomy and self-confidence.



From an **anthroposophical and relational** perspective, **González Rena (2018)** reminds us that every experience “becomes embodied”: the gestures, tone and emotions of the adult shape the child's bodily experience. In the water, the teacher's calm and respectful gestures are a language that conveys security and confidence. The quality of the bond becomes the foundation from which the child dares to submerge.

Social neuroscience explains this phenomenon. According to **Iacoboni (2008)**, **mirror neurons** cause children to reproduce not only visible actions, but also the emotional states of adults. The calmness, quiet breathing, and genuine smile of the educator are perceived and replicated at the neuronal level, promoting empathetic and regulated learning. Thus, rather than teaching “not to be afraid,” the adult **embodies the serenity** that the child incorporates through emotional contagion.

From the theory of **respectful motivation**, **Kohn (2001)** warns about the risks of praise as a form of control. Phrases such as “well done!” reinforce dependence on external approval. In contrast, descriptive comments such as “you wanted to put your face in by yourself” or “you pushed yourself hard” promote self-assessment and self-confidence. In the aquatic environment, this language promotes intrinsic motivation and reinforces emotional autonomy.

At an **ecological and educational** level, Pinto & Moreno-Murcia (2023) propose expanding the concept of aquatic competence beyond technical mastery. Being competent in the water involves integrating motor, cognitive, emotional and social dimensions in interaction with a changing environment. It is not about "knowing how to swim" but about making the environment "**swimmable for me**", adjusting attitudes, knowledge and emotions to each situation. Aquatic education, therefore, should encourage reading the environment, self-regulation and cooperation, rather than the mechanical execution of skills.

From a **physiological** point of view, studies by Thach (2001) and Urrutia et al. (1982) show that laryngeal reflexes and the diving reflex are natural mechanisms of protection and adaptation to aquatic life. The *laryngeal chemoreceptor reflex* (LCR) protects the airways from aspiration, while the *diving reflex* causes bradycardia and redistribution of blood flow, preserving oxygen for the brain and heart. These mechanisms confirm that humans have physiological adaptations to immersion, but they also highlight the importance of **not forcing or altering their natural development**. Progressive and voluntary exposure promotes healthy maturation of reflexes and a positive relationship with the aquatic environment.

For their part, Pérez & Moreno (2007) emphasise that **aquatic breathing** is not only a technical act, but also an emotional and global process. Breathing control is linked to the child's emotional balance and vitality. Forcing apnoea or imposing breathing patterns can cause anxiety and dissociate the body from the pleasure of floating. Rhythmic and free breathing, in sync with emotion and movement, reinforces calm and confidence.

On a biological level, research by Gislén et al. (2003) and Ilardo et al. (2018) shows that the human body retains remarkable adaptive plasticity to the aquatic environment. Moken children in Southeast Asia develop superior underwater vision through spontaneous play, and the Bajau people have genetic adaptations to tolerate hypoxia. This evidence shows that the relationship with water can be **natural and evolutionarily akin to human beings**, especially when free and non-coercive exploration is preserved.

In short, the contributions converge on a common conclusion: **voluntary immersion** not only respects the dignity and rights of the child, but also enhances their motor, emotional and respiratory self-regulation. Water becomes a privileged space for the development of **autonomy, confidence and sensorimotor enjoyment**, in line with the fundamentals of child development and contemporary respectful education.

In summary, voluntary and forced immersion approaches have clearly different consequences in motor, emotional and pedagogical terms. To facilitate understanding and provide aquatic technicians with a practical reference tool, Table 1 below presents a comparison summarising the main differences between the two approaches to immersion in early childhood.

Table 1. Main differences between voluntary and imposed immersion.

Aspect	Voluntary immersion (Natural)	Forced immersion (Imposed)
Immersion method	Chosen by the child in a playful and safe environment.	Applied by the adult (instructor/parent) without the child's consent.
Child's role	Active protagonist, decides when and how to immerse themselves.	Passive recipient with no control over the experience.
Emotional effects	Generates trust, enjoyment and curiosity.	Causes fear, anxiety and rejection.
Learning effects	Favours adaptation, play and progressive learning.	Hinders adaptation and can cause setbacks.
Motor and physiological effects	Autonomous development of breath-hold and greater coordination.	Risk of physiological stress and interruption of natural reflexes.
Relationship with the instructor	Builds a bond of trust with the instructor and family members.	Weakens trust and generates mistrust towards the instructor.
Long-term projection	Pleasant association with water, continuity in learning.	Unpleasant association with water, abandonment or stagnation.

Scientific evidence and official recommendations

The scarcity of randomised clinical trials on this topic means that recommendations are based on indirect evidence, observational studies, and expert consensus. However, there is scientific support for non-coercive methods. For example, Hertsgaard et al. (1992) compared cortisol levels in first-time babies to swimming and concluded that learners, on average, showed lower post-session cortisol than group control on land, indicating an absence of acute stress in a pleasant environment. On the other hand, studies in older children link fear of water to previous negative experiences: children who achieve fewer aquatic skills have often had “previous negative experiences in water” (Peden & Franklin, 2020), reinforcing the pedagogical value of ensuring positive experiences from the outset.

Additional studies confirm that systematic practice in water improves babies' motor skills. Jakobowicz and Ogonowska-Słodownik (2024) showed that after months of aquatic classes, participating babies significantly increased their scores on the Infant Motor Scale (AIMS) compared to controls without water classes. These benefits only occur when the experience is enjoyable, which is why an approach based on free play and voluntary immersion promotes better learning and enjoyment.

The American Academy of Paediatrics (AAP) in its 2000 position statement noted that formal infant swimming programmes have not been shown to reduce the risk of drowning, emphasising that adult supervision must be constant regardless of aquatic training received. The main objective of this document, directed towards the treatment of children at an early age, is to create safe habits and not to accelerate technical skills,

although it does not specifically address forced immersion. More recently, international aquatic teaching organisations ([AIDEA](#) and [AUSTSWIM](#)) have adopted explicit policies. AUSTSWIM (2023) stated its opposition to any forced immersion technique in infants, describing it as "inappropriate for their development and potentially harmful." In fact, many swimming instructor certificates include clauses prohibiting forced dunking or holding a child underwater without warning. For its part, AIDEA, in its guide "Bases para una educación acuática respetuosa en la infancia" (Bases for respectful aquatic education in childhood) (2024), advocates that all immersion should be voluntary, gradual and accompanied, rejects the use of coercive techniques and establishes that aquatic activities should promote the emotional well-being of the child, respect their adaptation times and encourage their autonomy in the aquatic environment.

Despite the historical persistence of certain practices that promote forced or conditioned immersion in babies and young children, a review of the current scientific literature shows a total lack of empirical evidence to support their benefits. No peer-reviewed study has demonstrated significant improvements in motor development, respiratory coordination, or emotional adaptation resulting from forced exposure to the aquatic environment or more specifically the immersion. On the contrary, some contemporary contributions in physiology, psychomotor skills, and child neurodevelopment (Beneito, 2012; Chokler, 2009; Langendorfer, 2019; Pérez & Moreno, 2007; Urrutia et al., 1982) agree that imposition or stress during aquatic experiences can disrupt natural self-regulation mechanisms, alter protective respiratory reflexes, and generate negative associations with water that hinder subsequent learning. Consequently, programmes that favour voluntary, gradual and emotionally supported immersion represent not only a more respectful pedagogical option, but also the only one consistent with scientific evidence and the principles of healthy child development.

The active engagement of the child as a principle of aquatic learning

Early childhood learning is based on exploration and the child's active participation in their own learning process. From a constructivist perspective, both Piaget (1970) and Vygotsky (1978) emphasised that knowledge is constructed through interaction with the environment and meaningful experiences, rather than through external impositions. This principle is key in aquatic education, as voluntary and autonomous immersion allows children to consciously and actively engage in improving their aquatic skills.

Science partially supports the idea of the existence of the diving reflex in infants (reflex apnoea, bradycardia) and the association of aquatic practice with improvements in underwater respiratory control (Veloso et al. 2007). The study Bradycardic response during submersion in infant swimming (Goksör et al. 2002) documents that, in healthy infants, during immersion exercises in infant swimming classes, an immediate decrease in heart rate (bradycardia) is observed. However, there is still no definitive evidence to

show that all babies spontaneously develop optimal underwater breathing patterns during autonomous recreational immersion. Nevertheless, we believe that the active involvement of the student not only promotes the acquisition of motor skills, but also increases confidence, enjoyment and a positive attitude towards new experiences in the aquatic environment.



In this regard, one methodological example that explicitly reflects the principle of active involvement is the [Comprehensive Aquatic Method \(MAC\)](#). This approach understands aquatic learning as a global process in which the child participates consciously and voluntarily, exploring the water through play, experimentation and social interaction. At these early ages, it is essential to create an environment that encourages exploration and is appropriate for the baby's stage of development. The aim is to provide safe and stimulating spaces where they can sit, crawl, climb up and down, as well as observe and manipulate objects underwater and at the surface, thus promoting independent discovery and sensory learning. The MAC does not impose standardised tasks but adapts to the pace and responses of each learner, ensuring that the acquisition of skills such as immersion takes place in a respectful, autonomous and meaningful way.

The scientific literature specific to aquatic activities confirms that children who actively participate in playful and voluntary experiences achieve greater progress in their skills. Sanz (2017) observed that, without the need for forced or adult-conditioned immersions, for example, counting 1, 2, 3 or blowing at the base of the nose or mouth before submerging, all the children in his study (aged 4–36 months) spontaneously developed breath holding and autonomous organisation of breathing underwater, thus improving their aquatic skills. Similarly, Jakubowicz and Ogonowska-Słodownik (2024) showed that infants who participated in systematic aquatic activities achieved better scores on motor development tests than controls, demonstrating that active participation in aquatic environments promotes the acquisition of motor skills.

Other studies reinforce this same conclusion. Leo et al. (2022), in a pilot study with infants aged 6 to 10 months, found that those who attended early swimming programmes achieved motor improvements compared to those who did not participate,

suggesting that active involvement in water is beneficial even from a very early age. In turn, Invernizzi et al. (2021) introduce the concept of aquatic literacy, emphasising that skills in the aquatic environment depend not only on instruction, but also on the child's opportunity to engage, explore and learn through meaningful practice.

This evidence is part of a broader body of research on active learning and play-based learning. Recent studies show that when children are actively involved in playful experiences, they achieve deeper cognitive, emotional and social development (Parker et al., 2022). Similarly, research on active pedagogy shows that student involvement mediates the positive effect of these practices on the development of curiosity and motivation to learn (Liu et al., 2024). Although not focused exclusively on the aquatic environment, these findings can be extrapolated and reinforce the idea that children's learning, including aquatic learning, should be built on voluntary exploration and active participation.

In contrast, forced immersion practices contradict this pedagogical principle. By reducing the child to a passive role and recipient of an action imposed by the adult, unpleasant experiences are generated that hinder learning, promote anxiety and sometimes lead to a rejection of water (Peden & Franklin, 2020). On the other hand, promoting active involvement means offering children a safe, stimulating and playful aquatic environment where they can progressively decide when and how to immerse themselves, turning immersion into a personal achievement that strengthens both their aquatic competence and their confidence.

Aquatic learning begins when children decide to get wet.

Examples of activities

In order for the pedagogical principles outlined above to be transferred into daily practice, it is necessary to offer aquatic educators a series of specific proposals that facilitate immersion in a respectful manner. These activities, designed around play and voluntary exploration, allow children to progressively adapt to the aquatic environment, developing confidence, autonomy and motor skills without resorting to coercive methods.

Games to familiarise children with water (initial stage)

- Free splashing: let the child splash the water with their hands or feet while sitting on the edge.
- Gentle rain: the adult, standing in front of the child, splashes themselves with a small watering can or a glass of water and invites the child to imitate them.
- Water mirror: invite the child to look at their reflection on the surface and blow bubbles.

Gradual introduction of the face into the water

- Toy fishing: place floating and semi-submerged objects for the child to reach.
- Bubble race: invite the child to blow through straws or blow ping-pong balls into the water.
- The water tunnel: the adult forms a “bridge” with their hands under the water, and the child passes underneath when they wish.

Partial and voluntary immersion games

- Treasure hunt: throw a toy into the shallow end and let the child decide if they want to submerge their face to retrieve it.
- Peek-a-boo underwater: the adult gently puts a doll underwater and makes it “appear” and “disappear,” encouraging the child to imitate them.
- Jumping like dolphins: from a sitting position at the edge, the child enters the water and can choose to submerge their face while the adult holds them in their hands.

Trust and autonomy activities

- Underwater trip with mum/dad: when the child requests it, they can make small dives leaning on the adult's back, holding on securely to the adult's neck or hands.
- Sign game: agree on a gesture or word that indicates that the child wants to submerge, reinforcing their control over the experience.
- Water circuit: combine floating, moving around and brief moments of voluntary immersion. Underneath tubular floats in tunnel mode or passing through hoops next to them.

Conclusion

A review of the literature and official positions converges on a clear message: teaching water immersion should focus on the child, using playful and respectful methods that encourage voluntary immersion. In practice, this means replacing adult-directed submersion with activities in which the child explores and decides when and how to submerge their head, under adult supervision and encouragement. For instance, after gaining confidence in floating and surface games, the child can, at their own pace, lean forward and put their face in the water to grab a toy. If the child refuses to repeat the activity, the educator will accept this and move on to another activity. Only when the baby shows readiness (voluntarily opening their eyes underwater or pretending to dive) should light support be provided to reinforce underwater breathing.

In short, evidence indicates that progress in infant aquatic education is best achieved without coercion. Approaches that respect the child's initiative do not delay the achievement of aquatic autonomy and improve the emotional experience. On the contrary, forcing immersion can generate fear, stagnation in learning, and unpleasant associations with water. For the scientific community and aquatic educators, the evidence-based recommendation is clear: always emphasize the child's safety and

emotional well-being, promoting natural and voluntary immersion, and avoiding coercive methods that lack scientific support and may be counterproductive.

The shift towards respectful aquatic education requires not only new methodologies, but also an ethical transformation in the role of the educator: moving from control to trust. It is not about teaching children to submerge themselves but rather accompanying them in their discovery of water as a space of freedom and trust.

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