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The Challenge of Water Entries

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Abstract

The authors presented a poster at the International Life Saving Foundation's World Conference on Drowning Prevention 2019 in Durban, South Africa titled, "*Finding an Aquatic Voice,*" that was the basis for this article. The conference theme was "Growing Global Drowning Prevention Capacity," and the aim of our poster's contribution to the conference was to explore internal reasons for the variable capacity of water-wary persons to engage in water experiences which often manifest as a "water entry and exit conundrum." The paper provides critical decision points associated with these issues to encourage further reflective practice by aquatic professionals. The poster triggered interest from a wide range of aquatic professionals. The paper intends to generate support for vulnerable persons and their instructors as a silent manifesto on the pool deck. A need for tools to create support for autotelic approaches has not been explored before and this paper starts to lay out a scientific case for why it matters.

Keywords: drowning prevention, water safety, swimming, water entry, open water

Introduction

Exploring learners' capacities to enter the water and exit the water is one of the most obvious starting points in any effort to educate novices / non-swimmers about water safety skills. Trainers can feel a distinct pressure for everyone to plunge straight into a set of in-water activities. This can lead to unnecessary pressure individuals who may refuse to join in lessons as a result of some fear that may have caused some pivotal life experiences to have been missed or misunderstood. In addition, fully clothed scenarios to mimic unplanned falls into open water are infrequently experienced during structured learn-to-swim sessions which provide a relatively safe and controlled pool setting. A**s** Connolly (2014) stated the impact of a lack of any 'situational conditioning' in open water without goggles and wearing clothes and shoes may in fact cause the person to become "overwhelmed by new experiences" (p 66). The result may produce a sense of helplessness that induces a swimmer to surrender to panic and diminish their capacity to help themselves. In addition, cold water has a strong negative impact upon everyone's ability to function when first immersed (Golden & Tipton, 2002; Buck, 2015). It particularly may impact those who have never been exposed to cold in open water conditions before (Buck et al., 2019).

Ultimately, carefully conditioning all learners to be able to use aquatic skills beyond the simple exercise of a regular swim class could potentially save a life as it is important that both children and adults can handle the outdoor environmental challenges with confidence (Baker, 2019; Kjendlie et al., 2013; Petrass et al., 2012; Moran, 2019). How do we best support learners to reach beyond fear and natural reticence all the way through to enjoying some joyful

capriciousness before experiencing more surprise-ridden and uncontrolled environmental drowning conditions? “The secret is that the supervisor has to be able to give the right combination of nurture and autonomy” (p.5) by Alison Gopnik (Wing Kosner, 2019a).

Subtle tactics and wider considerations by water safety educators are not necessarily well understood or the focus of parents when they enrol their children in swimming lessons. Educators are presented with a dilemma as a child contemplates their own launch into the water for the first time. We as adult educators can feel the urge to encourage their first entry into relatively safe water conditions, but we may fail to consider developmental factors.

In our model of internal self-priming towards efficacy in and near water (Figure 1) we explore what happens unseen, changing the focus to that of the truly self-led learner who is new to the wonders of the aquatic world around us rather than their parents or the teacher. In the context of aquatic entries and exits we consider the following consideration to be most important: We define our aquatic physical fitness by how quickly we perform then recover from strenuous exercise and by the same token we need to know how quickly we can recover our own agency after emotional shocks in the water.

Exploring the Impact on People of Entering Water

The simple act of a novice swim learner getting into and then out of water again sets in motion a whole new world of interactions that can fascinate and greatly empower us as aquatic instructors. Very young children just like the rest of the population are drawn to experiment with or near transition zones of water, whether it is safe or not. When a water-wise guardian offers safe exploration in and around water to a novice learner of any age they invite a cascade of engagement to start with a unique space that bridges two environments of human existence. We believe most learners want to take up this invitation for adventure to expand themselves preferably at their own pace. It is our premise that the nature of the earliest interactions between the guardian, the novice water learner, and the water setting itself most strongly define the lifelong attitude of the novice towards their own safety in water.

Early Choices Set the Tone.

While carrying out our role at the waterfront using challenging training, it proves crucial to understand what happens at the start of learners’ paths because their routes to arrive in front of us are unique to them (Baker, 2019; Andrews, 2019; Stafford, 2019). Those who appear most challenging to help are clearly reluctant or unable to enter the water because they have not experienced what we want everyone to openly understand and respect. Physiologically, they seem to have no choice but to obey their basic survival instincts of feeling on guard whenever they are near water (Ramsey, 2018). Only after they have gained

control over their internal state can they begin to engage with the water (Dash, 2006; Pascual-Gomez, 2011; Andrews, 2019).

In our priming model on the poster (Figure 1) we have hinted at what happens to a person internally who cannot enter the water at first because they are too fearful before finding calmness to choose, “Yes, I am ready to go now” or “No, it is not safe now for anyone in these local conditions” with a voice of ‘aquatic wisdom’. We can measure the reliability of our own internal state in water by listening to this inner chatter, priming us to gauge the energetic consequences of our actions. Deploying this self-efficacy is our lifesaving goal.

Figure 1 explores likely components involved in self-priming. The safest way for reticent people to learn is to give them the opportunity to find and practice being in and around water as their optimal self. Without that internal exploration time, asking “Can I learn to reliably maintain control over my emotional state in stable conditions?” they can remain vulnerable, especially if challenged at a later stage. Reticent persons can also suddenly go against their better instincts or choose not to make any internal safety checks at entries too so they must be educated and not be allowed to throw themselves into unknown situations with dangerous forms of physical abandon without being made aware of the real-world safety consequences.

The irrational risks persons take in water are explained by the fourfold pattern of prospect theory (Kahneman 1979). Those that see a high-risk situation with a very low chance of success still leap in. Those that see a low-risk situation with a very high chance of success can still refuse to go in because they have made a personal value judgement. Value judgments are seeds of water safety. Being poor at making appropriate decisions at the extreme ends of risk everyone needs to have experienced a lot of the safer middle ground, having made and forgiven themselves for many safely guarded mistakes. They need to be educated about the dangerous impulses that can appear at the high end of risk while instructors must know about the need for stability at the low end of risk.

Figure 1

An illustrative model of internal self-priming towards efficacy in and near water

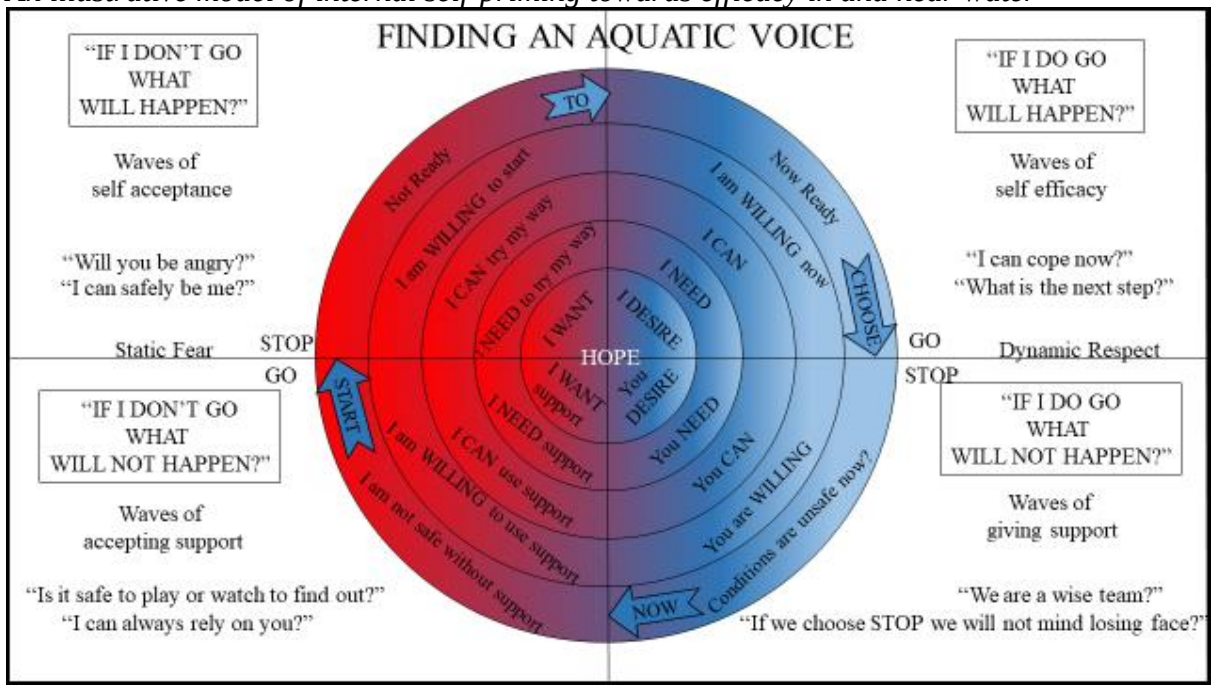

Table 1.
Summary of important evidence that outlines the other sources used to generate the illustration in the poster.

Name of Theory	Author & Date	Description of Theory
Reflections on the hidden meaning of learner disobedience	Leafgren (2009)	There are many safe ways to approach a novel skill in water. If a person is unwilling to try one way they are not being disobedient.
The cartesian co-ordinate perspective taking practice of neuro linguistic programming	Ready & Burton (2015)	Empathic perspective taking and supportive atmospheres are at the core of enabling successful skill embodiment.
The developmental psychology of learning through our social engagement interface.	Meltzoff (2007) Fernyhough (2017)	How babies and young children become self-aware, then shape their concept of self through interaction impacts all age groups in water.
The Choice Engine	Stafford (2019)	The concept of free will being generated automatically in a brain-body by individuals being in a unique place at a unique time.
The Neuroscience of Readiness Potentials	Begun by Libet et al (1983)	The science of exploring readiness and the nervous system processing steps that generate a sense of self agency is key evidence.
The Fourfold Pattern of Prospect Theory	Kahneman (1979)	Patterns of entering high risk situations and resisting low risk opportunities inform us how to best instruct all aquatic learners safely.
A graphic illustration of the multiple hidden processes likely to be used to find an	Andrews & Baker (2019)	Imagining that a Fourier series of five neuro-cardiac sine wave functions can

independent aquatic voice.		draw illustrative circles to represent key changes in internal needs status from a glimmer of hope to full self-control through want, need, can and a final willingness to go ahead.

Crucial Scaffolding for an Aquatic Voice

The skill required of an instructor is to allow enough time for everyone to take steps to further their own safety in and around the water. If we try to short-cut and override this process to suit external schedules, we risk trauma or misshaping their own self-efficacy (Ramsey, 2018; STA, 2017; Vaish et al., 2009). When we encounter someone of any age who, like the child in the poster, feels reticent about entering the water means we need to stop, put our original agendas aside, slow down, and enable them to use their natural priming process. This natural priming process may take just a few minutes or as long as months, but the result is of far greater utility to them than anything we as their instructor will gain from helping didactically. In his book, Grafton (2020) explored the science of physical learning by 'thinking without thinking,' with our 'silent, ruthless intellect' when moving across challenging terrains. Interrogating new environments via our physicality makes us safer by default and fully present for aquatic engagement. In aquatic environments, we learn from the support we receive how to give support back to others in the future. This is the basis of our aquatic inner voice.

Pressure Free Entries

When people arrive at the 'waterfront' they are trying to glean useful information from their surroundings. If they are fearful or even nervous, the accuracy of this information is less valid. Fearful states cannot persist with safe exposure under the following conditions:

- Their fears are acknowledged and fully respected with calm and honest acceptance;
- They use their own senses, breathing, and intra-adaptation to calm down, and engage; and
- They enjoy full permission to decline, explore or revisit steps and pre-steps with appropriate support.

Young children who are novice swimmers often are content when safely enabled to explore naturally. Persons of all ages instinctively may use fixed physical structures such as ledges, sunken frames (Roelandt, 2019), walls, poles, bars, rails, ladders, zero-entry beaches and slopes to gain reliable support. Adults with debilitating fear often are freed by the removal of performance

pressures and can be shown how to adapt their own body with controlled breathing and body tension removal exercises (ALP, 2019). All age groups often respond to heart rate synchronisation with a close, calm, and patient supporter (Palser et al., 2019; Soosalu et al., 2019). It is this form of deeply reliable support above all that helps most novices successfully find their personal aquatic voice.

Research summarised by Siegel in 2017 and begun by Coelho & Wallace (2010) has started to decipher the complex psycho-physiological origins of acrophobia (fear of heights) which can significantly impact how aquatic novices feel and behave, similar to how anyone may feel when standing exposed in very high places. When anxious we place far more trust in what we see being the grounded truth (Teachman et al., 2008). Visual perception is generated by our sense perception and body kinaesthetic, but our mental states can lead us to misjudge distances (Vagnoni et al., 2012).

Experimental evidence has shown that we misjudge heights more significantly than we misjudge horizontal distances (Willey & Jackson, 2014). A recent study showed surprisingly accurate horizontal distance estimations by triggerfish may have revealed a way to shed future light on how all animals with a backbone originally evolved their ability to navigate spaces (Karlsson et al., 2019)

Faulty visual perspective, poor body control, weak vestibular signalling, and overestimation due to anxiety can lead to 1 in 20 of us having acrophobia which may lead us to feel the impulse to 'yield to the source of panic and willingly jump' (Siegel, 2017, p. 2) or freeze, confused by this irrational impulse at the edge (Hames et al., 2012; Quirin, 2012).

To safely overcome anxiety about water entries and exits, repeated climbing in and out as well as addressing the water surface itself is a primal process of asking and answering intrinsic questions with the body about geometry, synchronicity, and causality to build a reliable internal working model of where we are, what works, and what doesn't. The physical parameters of our external world become embodied by the internal physiological world of the brain-body system through repeated safe experimentation (Reimann et al., 2017). This is how we build a flexible understanding of the world, while feeling enabled to make our own mistakes and safely exit situations under our own free will. This allows us to respect water and build future internal aquatic resilience.

When a nervous system becomes well-regulated the first solo jump into the water may soon follow. Exactly how this choice to leap happens is being explored by neuroscientists to find the causes and patterns of volition and agency via the physical science of sentient systems.

Libet et al. (1983) first investigated the brain processes underlying the awareness of intending and doing voluntary actions. They discovered by measuring the timing of experience with electroencephalography (EEG) measurements that electrical readiness potential for a movement in the brain preceded the intent, calling into question the concept of free will. This triggered studies into the mental chronology of conscious action and inactions.

In a review, Frith & Haggard (2018) related how researchers discovered through experiments that the vividness of the conscious experience of our own agency increases with how much we care about the outcome. Vividness also increases with belief in how much work we have done under our own volition and when the action is moral rather than economic in nature.

Spontaneous voluntary action may somehow be taking advantage of randomly generated stochastic noise in the brain rather than being triggered by unconscious readiness potentials milliseconds beforehand. This access to an element of randomness may be what we can use to generate our sense of having free will (Schurger et al 2012) and it is neatly described by Frith & Haggard (2018) as "given a weak imperative to move, the precise moment at which the decision threshold for movement is largely determined by spontaneous fluctuations in neuronal activity" (p. 407). Children are most in touch with this form of capricious action and Greene-Pettersson (2014) described how readily adults can lose but then regain a connection with it.

Galbusera et al. (2019) described how synchronized movements in real-time feel good but can impede the self-regulation of affect. For example, only ever jumping in together may feel convenient or fun for instructors but can also lead to a false sense of security. There is a need to enter alone at some point and this can only be done via independent self-regulation.

Before the age of nine years children do not have a fully developed capacity to feel or identify regret so they may make capricious decisions and jump into water before they have had much experience, thus putting themselves at risk due to not being able to support themselves once in the water. By contrast most novice adults have an awareness of the dangers of jumping, diving, or falling into water and may rate such actions at the more difficult end of aquatic accomplishment continuum. Swimmers must feel ready to cope with a physiological surprise (Wing Kosner, 2019b) and use deeper water to minimise injurious contact with the pool floor at first. This means that they are most likely to be ready to jump in nearer the end of their learning curve rather than just after they have begun learning to float or while they are still gaining other key in-water skills.

Regret is closely connected with a sense of responsibility for actions taken. This is a crucial part of finding and using an aquatic voice so all ages need to be trained to employ an inner sense of personal responsibility for their

own safety in water. This means that the subconscious working ecosystem generated by the 'learn-to-swim' culture, known as a Markov Blanket (Kirchoff et al 2018) ought to encourage the development of internal regulation with self-led learning and safe mistake-making from the outset. Therefore, the aim of our model (see Figure 1) was to help generate a more effective Markov blanket for those needing gentler learning pool settings to succeed at learning to swim. Specifically, we wanted to minimise distractions, complexity, and avoidable uncertainty to create and maintain a positive atmosphere for priming aquatic voices.

Hindering the Aquatic Voice

Direct forcing in aquatic situations can generate trauma and delay or prevent a swimmer from fully developing as described by Ramsey (2018) and illustrated by our case study below.

A Case Study of Learner Swimmer "S"

At the age of eleven S had just been diagnosed with a rare form of epilepsy. The epilepsy had only recently been controlled with drugs that would need to be taken for the rest of her life. Her parents had recently divorced, and she was still recovering from an ear infection when an unsympathetic physical education teacher lost her patience during a school swimming lesson. "S" was sitting on poolside dangling her legs into the water explaining why she did not want to go into the water as requested when the teacher unexpectedly pushed her hard in the back so that she fell into the pool. The unexpected immersion accompanied with the fact that she was a weak/non-swimmer out of her depth caused her to panic. She vaguely remembered being rescued by a male teacher. Her mother visited the school to make a very strong complaint against the teacher but unfortunately this backfired badly because it simply led to years of bullying in subsequent physical education lessons. Later in life "S" struggled to learn how to drive and suffered from severe panic attacks which made it difficult for her to find her way home in her car.

When "S" had two sons she was determined that they would both learn to swim. She spent lots of time walking in pools to help them. Her sons learned to swim well, but she still feared falling into deep water when her husband invited her to snorkel in the sea off Cyprus. She enjoyed snorkelling until she experienced a sudden panic attack in deep water where the sea floor had dropped away.

She had learned how to perform four swim strokes to an intermediate standard by going regularly to a supportive swimming class for adults, but she still suffered from debilitating spells of panic when pushing away from pool side or off the floor on her front. It was at this point in her 60s that she sought tutorial help from a swimming instructor who specialised in helping people overcome their fears in water. She learned how to build much greater self-

control in the water, expanding her comfort zone after first addressing the origin of her fear on dry land which made her cry with the welling up of long trapped emotion.

She learned how to float vertically in the deep end and to enjoy free floating near steps to regain a position where she could breathe, roll over, and travel freely. Over several months, she overcame her fear of pushing away from the wall by putting her head into the water first and enjoyed more comfortable and modifiable strokes. At the same time her husband noticed a positive change in her self-confidence. She took up piano lessons and drove places without fear of having panic attacks. The class teacher noticed a huge positive change in her overall confidence levels.

Continuing solely with her group swimming class she spent an hour each week swimming 12 metre widths of four strokes always at the same position along the wall, often not needing to take any breaths to cross the pool. At her position in the class she was standing in mid-depth water and was surrounded by the same individuals each week.

Several years later her foot slipped off the wall when she was pushing away to do front crawl in class and the block of panic reappeared. This time since she had had some one-on-one lessons again, the nature of the fear became much clearer. The memory of the push and fall that had come out of nowhere was still so intense that it took six lessons to feel that she had overcome the block. It was not entirely certain what would happen in the future if a similar unexpected incident occurred. This time she did learn how to gain some agency over the block by doing a little jump instead of keeping her feet on the floor as she set off. The block was so deeply seated that it was hard to heal completely and it was very likely to return if not fully addressed away from the formally structured setting of her class.

Cautionary tales like those of “S” and countless others lead the fearful to assess whether their instructors are going to be angry, dismissive, mocking, negative, or rather sympathetic, positive, caring, empathetic, and patient. This process of building trust can hold them up. Can you model and use the aquatic attitude you want the learner to use? When we are overburdened as instructors with eliciting performance from our learners, we are at risk of taking routine priming events wholly for granted or labelling them as unnecessary play. So it is important to check our own effectiveness as educators by choosing to watch in awe as the natural hard-wired programming we are all born to use when we are freed of unnecessary burdens and distractions starts to work in front of our eyes (Andrews, 2019; Aquaphobia Learning Programme, 2019; Aqua Sensory Tribe, 2019; Birthlight Trust, 2019; Dash, 2006; Faerch, 2018; Freedman, 2017; Halliwick Association of Swimming Therapy, 2019; Hindmarch, 2013; Langendorfer, 2019; Miracle Swimming for Adults, 2019). Once freed of fear

in deep water persons can indulge in developing an understanding of safe competition as a natural stretching and self-limiting learning process.

Oliveira (2019) recommended that those stretched in water with challenging psychomotor tests must first have experienced safe independent aquatic joy because aquatic trauma is so easily generated in us. Trauma is usually only removed with gentle support and therapeutic ideas used by practitioners who use concepts that overlap with developmental trauma treatments used by specialists in psychotherapy. Those trying to overcome aquatic trauma often retain an increased vulnerability to drowning. This vulnerability reduces when practitioners are supportive.

Conclusions

For our poster presentation at the World Conference on Drowning Prevention we chose an image of a person who stood at a critical point having developed a fear to enter the water from a small height above the water surface along with consequent loneliness, but an obvious desire for courage. We expected this image of fear of the water to pique observers' curiosity and induce reflection about acts of empathy proposed to provoke a respectful understanding and suitable atmosphere for working with fearful or reticent learners.

In his book on ancient oral records of major post-glacial aquatic events Patrick Nunn (2018) talked about how literacy has encouraged us to dismiss the vast working knowledge amassed by our countless ancestors. Now we see, through evidenced-based science, that powerful autotelic processes have long enabled us to thrive just by supporting each other safely in water without even speaking out loud.

Future research could explore the responses evoked by the poster in order to evaluate its effectiveness at generating a more supportive atmosphere.

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