THE SCIENCE OF EDUCATION FOR PEACE
TOOLS TO SOW PEACE IN AND AROUND US

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The UNESCO World Science Day for Peace and Development is celebrated every 10 November. It highlights the important role of science in society and the need to engage the wider public in debates on emerging scientific issues. It also underlines the importance and relevance of science in our daily lives. The theme of the World Science Day for Peace and Development 2020 is “Science for and with Society” and UNESCO aims through it, to ensure that citizens are kept informed of developments in science and underscores the role scientists play in making our societies more sustainable. We hope with UNESCO that the day may be marked by compassion, kindness and hope in the face of the common challenges of the pandemic. The invitation is to stand together against attempts to use the virus to promote discrimination and hatred; a commitment that the global community has more in common than ever before.

According to the Armed Conflicts Location & Event Data Project, ACLED\(^1\), from September 2019 to September 2020 some 114,723 people have died in numerous conflicts around the world, not counting the other collateral damages arising from these conflicts in the subsequent years. How to deal with the horror of this situation? Patrizio Paoletti Foundation for Development and Communication strongly believes that the key lies in education and that this is an individual and joint commitment.

The great philosopher Baruch Spinoza used to say: “Peace is not the absence of war, it is a virtue, a state of mind, a disposition to benevolence, to trust, to justice” Peace is something that one has to educate oneself. This is why for many years the Paoletti Foundation has been involved in educative projects also in extreme life situations, even on the frontline, where violence is the order of the day. This approach has been chosen in order to create the conditions necessary for a new educational paradigm which we would call Human Inner Design.

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\(^1\) Armed Conflicts Location & Event Data Project, [https://acleddata.com](https://acleddata.com)
Building schools, providing care and food, and training teachers are indispensable actions that we invite you to perform together with us. Along with this, we firmly stand for the necessity of a new educational paradigm scientifically founded, to be focus on our inner world.

The invitation we extend on this day is to make a daily personal commitment to educate ourselves about and towards peace and to **spread compassion, kindness and hope around us**. That is why we propose here some didactic ideas from the most recent publications of RINED, our Research Institute in Neuroscience, Pedagogy and Didactics, that we are honoured to put side by side with the contributions of Dr. Adele Diamond, Canada Research Chair Professor of Developmental Cognitive Neuroscience at the University of British Columbia in Vancouver, BC, Canada.

In this year of 2020, we are facing new and uncertain times which require an equally new level of preparation. We need to have at our disposal **inner tools** that allow us to better deal with the external environmental complexities. Indeed, as the work of Abraham Maslow and his “pyramid of needs” teaches us, if we do not address the basic needs of our body and mind, we will not be equipped to deal with the full range of external factors in life.

In recent months, the European Union has promoted the practice of meditation as a means of improving mental health and addressing the pitfalls of the current global situation. Here, we propose a journey through recent **scientific publications that explore the effects of different types of meditation** and what they teach us to cope with everyday life. We will begin with the idea of the outer and inner “environment”; to discover how we can create and frequent **spaces of silence** within ourselves - where we are not invaded by the daily stresses that bombard us from every direction. We will then move on to discover the **extraordinary power of the senses** and the interpretation of the sensations we experience. Here, we seek to manage ourselves in the best possible way and thereby lead ourselves to an inner place of Peace, even when this may seem very difficult. Finally, we will conclude with some of the most fascinating results of the investigation into our **relationship with our memories**, and how this relationship can be transformed to **best configure the future we desire**.

Then, Adele Diamond addresses how the “executive functions” of self-control, attentional control, and cognitive flexibility help us in achieving and maintaining peace within ourselves and in our relations with others. These tools can help us to cultivate a state of freedom and well-being. It is true that Peace is not the absence of war, but rather an inner state of being.
2. SEARCHING FOR SILENCE: MAKING ROOM FOR PEACE

One of the most significant discoveries from neuroscience over recent years is the influence of the environment on our brain function. Numerous researchers have shown that environmental stimuli can dramatically transform the neurological pathways in our brain; undoubtedly due to the remarkable plasticity of this organ. For example, the lack of silence experienced in many urban environments has now been reframed as noise pollution that results in reduced learning ability and sleep disturbances. These can lead to a reduction in insight, i.e. those moments of intuition that are so important for our personal and social well-being. There is, however, not only an external environment with all of its stimuli, but also an internal environment and the two constantly relate to each other. Indoor and outdoor environments do not act independently on the individual, but rather work together to shape thoughts, feelings and behaviour.

The internal environment includes intrinsic determinants, i.e. the psychological,

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neurological and physiological mechanisms of the person, while the external environment includes extrinsic determinants, such as those related to the perceptive dimension. The most important difference between inner and outer environments lies in the degree of intentionality with which we can determine them. Often, we have little control over the external environment, however we can educate ourselves for improved mastery of the inner environment. We can begin to envisage ourselves as a space that is cluttered by the varied contents of our mind, and that care is required to our thoughts in good order. Indeed, Buddhists know this as the Monkey Mind, where uncontrolled thoughts flow like a group of monkeys jumping from tree to tree. By taking more care of the inner environment, however, we will be more capable of taking care of the environment outside of us, which is an indispensable need for all of humanity today.

How to do it?

Certainly meditation, with its many benefits now proven in numerous research studies, is an excellent tool, but how to use it? There are many techniques and it is good to start with a competent guide to what is a thousand-year-old discipline. The goal is to attain a degree of inner silence. This is not necessarily the absence of thoughts or emotions, but rather the ability to monitor thoughts and emotions as a compassionate observer, and in this way, they do not invade our mental space. Obtaining this outcome requires a degree of physical relaxation and dedication to what the great researcher Francisco Varela called “First-person science.” Here, we study ourselves with the curiosity of a scientist on the verge of discovering something new. Such education of the mind allows more mental space to develop and better management of our emotions. Devoting some time every day, perhaps at the beginning or end of the day, to take a few minutes to silent meditation can make the difference.

Clearly, external environments are also very important. For example, spending time in nature has been reported to be associated with good health and wellbeing. For example, spending at least 120 minutes a week in nature is associated with good health and wellbeing. Scientific reports, 9(11), 7730. https://doi.org/10.1038/s41598-019-44097-3

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work, in the gym, etc.. It is very important to take care of these environments in the best possible way. This does not necessarily mean that they have to be silent. Note the silence we are discussing is not absence of sound, but rather an awareness of the inner space. So, the determining factor is the intention we place in the care of our environment. For example, we can choose some elements, like organizing the spaces, inserting references like an image or a plant, or something specific that reminds us of our best intentions.

In deepening: the latest publications of RINED - Research Institute for Neuroscience Education and Didactics

3. CHANGE THE NARRATION OF SUFFERING

While pain is an inescapable reality of human life and an inevitable aspect of our experience as humans, **we have the power to change our relationship with it.** Indeed, often the experiences of pain lead to a distortion of objective judgement, and thus to the formation of feelings of aversion and negative beliefs. Numerous studies have shown that **pain is a conscious experience**, which can be considered **an interpretation** of physiological nociceptive input and potentially **influenced by many factors, such as memories, emotions and cognitions**. Thus, finding a way to voluntarily switch from the maladaptive and automatic narration, which is usually predominant in these conditions, to a **proactive intentional narration**, can help to improve not only the mental experience, but also the physical symptoms themselves in situations of suffering. For example, an inspected power is tied to our words for ourselves. As we will see in detail in Chapter 5, our cognitive flexibility might prove very helpful in these situations. By choosing carefully our wording, we can give effective suggestions to our brain. Instead of: “This is a quite hard time for me, my life doesn’t go well,” we may say: “This time, like any other in my life, will pass by, no one can be always fine, this is the game of life and is fascinating.”

Research conducted by RINED using the Quadrato Motor Training and other movement paradigms have shown that there is a connection between movement in space and mental navigation, both mediated also by theta frequency. We possess an inner space in which we can learn to move in order to **change our relationship with experiences.** If we find ourselves in a situation where we perceive our mind completely overwhelmed by a certain sensation, we can move inwardly towards wider spaces, and educate our children to do the same. Focusing solely on the sensation of the moment will only increase its intensity and can create strongly influential memories. We are not pretending that there is no suffering, but rather we are proactively **exploring our mind’s ability to modulate it.**

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How to do it?

Suffering is amplified by ruminating over it, an activity connected to the Default Mode Network, the brain’s default network related to the most automatic thoughts. **We can educate our children and ourselves to “move” inwardly**, not by undermining or ignoring what we feel, but simply by shifting the focus of attention. In this way we will learn to interrupt the identification with the feeling of that moment, and this will have concrete beneficial effects also on a physiological level. Sometimes runs on a loop in which our attention continuously traces the same paths. In those moments the simplest strategies are effective, like to think to some object out of context, like red sockets in a serious situation. Laugh maybe the result and laughing is always healthy.

*In deepening: the latest publications of RINED - Research Institute for Neuroscience Education and Didactics*

- Paoletti P., Ben-Soussan T.D., Glicksohn J. (2020) Inner Navigation and Theta Activity: From Movement to Cognition and Hypnosis According to the Sphere Model of Consciousness, [online first], IntechOpen, DOI: [10.5772/ intechopen.92755](https://doi.org/10.5772/ intechopen.92755)
4. THERE IS NOTHING WRONG WITH CHANGING YOUR MIND

Among the research in progress at RINED, there is a particular meditative technique called “The Place of Pre-existence” and already over 500 participants have experienced the direct relationship between interpretation and memory. The technique - through a series of specific suggestions studied by Patrizio Paoletti - proposes to the participants to mentally “rewind” their story and imagine for a moment that they are in an inner place that existed before everything else has happened in their lives. Following this path, the participants discovered that, by finding a new point of view on their own history, they had improved their freedom to look at things from different angles. Here are some of the participants’ reports:

“My thoughts were free from judgements, memories and mental patterns, the noise disappeared and silence appeared”;

“I experienced the redefinition and focusing of emotions, leading them to a neutral and useful condition”; “I felt the transition from positive to neutral emotions, as the breath became calmer and inner peace increased”; 

“I felt positive emotions of peace, possibility, trust and compassion”; 

“The technique took me to a neutral place, without time or space, where I found the possibility to start a new story”. These are just some of the testimonies.

The participants thus had a concrete personal experience of how our memories are fundamentally narrations. Because memory records events by associating them with points of view that we held at the time, we have the opportunity to re-narrate those points of view and thereby provide the brain with further data to enrich our understanding and achieve a multi-faceted reading of the events.

Training to stretch the mind is very important to improve our ability to relate to ourselves and others. We all happened to discover - sometimes after years - that the episode involving a loved one had been experienced by him or her in a completely different way. Sometimes we cultivate aversions that are
based exclusively on the partiality of memories, and in family or work life, when the rhythms become frenetic and we seem to have no time for details, very long-lasting misunderstandings can also arise. Another fundamental aspect to consider is that the areas of the brain that we need to remember past events and imagine future ones are largely the same. This implies that **our relationship with our memories has a direct influence on how we imagine our future**, with all the emotional consequences that this can have in one way or another.

How to do it?

We can train ourselves and our children each day to **briefly review the events of the day**. By highlighting the **positive events** and examining those that **appear negative to us**, we can seek to discover how to improve our narrative of the day. Then, from an inner place of broader possibilities, we will be better placed to prefigure **the future we desire**. By giving our brain an image, a de-
scription of what we aspire to for the next day, we can allow that extraordinary computer inside our skull to organise the data in the best possible way to support us.

*In deepening: the latest publications of RINED - Research Institute for Neuroscience Education and Didactics*

5. PEACE IS A STATE OF MIND: ACTIVATING OUR FRONTAL LOBES AND OUR EXECUTIVE FUNCTIONS.

Executive functions refer to a family of mental processes needed when you must concentrate and pay attention, when it would be impossible or ill-advised to go on autopilot or rely on instinct or intuition. There are three core categories of executive functions. The first category is inhibitory control, which includes both attentional control (focused attention) and self-control. Another category is working memory (holding information in mind and working with it), both verbal and non-verbal information. The third core executive function, which builds on the other two, is cognitive flexibility, both seeing the same thing from different perspectives and switching between different mindsets. From these the higher-order executive functions of creative problem-solving, logical reasoning, and planning are built.

Executive functions can be a great aid in attaining and maintaining a state of peace within yourself and between you and others. Let us take inhibitory control first. For example, when someone hurts our feelings, a natural immediate reaction is to want to lash out and hurt that person in return. We can use self-control, however, to resist that tendency and avoid getting in the cycle of tit for tat. Many of us have had the experience that our initial interpretation of the intention behind someone’s words or actions was not correct, and we have either been grateful we exercised the self-control to wait until we learned more or regretted that we acted before waiting. We can also use self-control to avoid blurt out the first thing that comes to mind when that would hurt someone’s feelings or embarrass us. It takes self-control to wait until our initial annoyance has subsided before pressing ‘send’ on an angry email message.

The subcomponent of inhibitory control referred to as interference control or attentional control involves resisting internal or external distractions. For example, it can involve resisting extraneous or unwanted thoughts, ruminating, or mind-wandering. As we have seen in the previous chapter, ruminating about something that is bothering you, something you did wrong, or something wrong that was done to you only magnifies your pain and suffering. We need to be able to let the past go.
Let’s turn to cognitive flexibility next. Cognitive flexibility is very related to the chapter “There is nothing wrong with changing your mind.” How can it help build peaceful social relations and peace within ourselves? One example would be instead of focusing on the differences between you and someone else, such as in political views, you could use cognitive flexibility to switch to thinking about the similarities between you and that person, such as in both wanting the best for your children. Employers and educators can switch from focusing on workers’ or students’ weaknesses to instead, much more productively, focusing on their strengths. We can use our cognitive flexibility to see things from others’ perspectives. Or, instead of worrying about the future, we can switch to focusing on, and enjoying, the present moment. It takes cognitive flexibility to admit: “I was wrong and you were right.” We can get terribly upset when a job, opportunity, or trip we were really hoping for does not materialize; but then we can take advantage of our cognitive flexibility to explore what new opportunities this has opened up for us.

We are hard-wired to get upset when we detect danger in the environment. At the first sign of danger, the brain’s “fire alarm,” the amygdala, starts blaring. Often however, we have gotten alarmed over something that turns out to be benign, such as when what sounded like gunfire was actually just a car backfiring or when screams that alarmed us turn out to be screams of joy. When that happens, the area of the brain most important for executive functions (the area known as prefrontal cortex) relays signals to the amygdala telling it to stop
firing. It’s as if prefrontal cortex tells the amygdala, “You can calm down now. I’ve got this; there’s no cause for concern.”

When a student isn’t grasping a concept, we often blame the student: If only the student were brighter, or better in this subject, he or she would have grasped the concept. We can exercise cognitive flexibility, however, and consider: “What might I do differently? How can I present the material differently, or word the question differently, so this student can succeed?”

How can we stop ourselves from getting really upset when a child misbehaves? We can use cognitive flexibility to re-frame since what we usually get upset about is the intent we think is behind an action. Please allow me to provide a couple of examples.

Suppose a youngster of 3, 4, or 5 years knows exactly what he or she should do, but doesn’t do that. Our first inclination is to think the child is intentionally misbehaving and should perhaps be disciplined. However, using our cognitive flexibility we can change perspectives and remember that young children have very immature self-control. A preschooler may know what he or she should do, and very much want to do that, but still not be able to act accordingly. When there’s a strong competing response, that response must be inhibited; a young child may be misbehaving because he or she is not yet able to do that.

Suppose a school-age child is being an absolutely insufferable brat. Instead of reacting with anger we can re-frame and consider that perhaps that youngster is acting in this awful manner because he or she has been terribly hurt and is afraid of being hurt again. To protect himself, the youngster may be pushing us away before we have a chance to reject him, or the youngster may be testing us to see if we are really people he can feel safe with. If we see the misbehavior as coming from hurt, we can react completely differently.

As Patrizio wrote above in “Change the narration of suffering,” while pain is an inescapable reality of human life and an inevitable aspect of our experience as humans, we have the power to change our relationship with it. In fact, one of the most profound ways we can use cognitive flexibility to be more at peace is to shift from focusing on how difficult and rotten the hand we’ve been dealt is, to instead focusing on making the best of it. As Alan Watts7 wrote:

You want to escape from pain, but the more you struggle to escape, the more you inflame the agony.

Sometimes, when resistance ceases, the pain simply goes away or dwindles to an easily tolerable ache, or the pain is no longer problematic.

I am chained to the fear only so long as I am trying to get away from it.

Similarly, we tend believe that the unacceptable aspects of ourselves, the parts of ourselves of which we are ashamed, create our suffering and keep us from forming a close relationship. With cognitive flexibility, however, we can realize that it is actually our non-acceptance and disowning of those aspects of ourselves that create our unhappiness. Inner peace requires that we acknowledge and make peace with all the different parts of ourselves including the parts we wish weren’t there. Further, to paraphrase Brene Brown, what keeps us out of connection is the fear we are not worthy of connection. Those in loving relationships have the courage to accept themselves, imperfections and all. They have the compassion to be kind to themselves. They are willing to let go of who they think they should be in order to be themselves. We are all imperfect; yet each of us is wonderful in our own way.
**How to do it?**

Jamie Pennebaker\(^8\) has shown that by writing about what is bothering you day after day, trying to wrap your head around what happened so you can let it go, can do wonders to end ruminating, relieve stress, and improve physical health. Instead of focusing on what’s rotten, switching each day to take a few minutes to note the wonderful things, the things you are grateful for, helps reduce stress and depression, increases happiness, improves interpersonal relationships and sleep, and lowers the risk of heart disease.\(^9\)

To improve any of the executive functions, you need to practice them and challenge them. Executive functions suffer if you are sad, stressed, lonely, sleep-deprived, or not physically fit. Conversely, executive functions are generally best when you are happy, not stressed, follow a healthy life style, and feel there are people around who care about you, believe in you, and will be there for you.

*In deepening:*

- Diamond, A. (2014). Executive functions: Insights into ways to help more children thrive. Zero to Three, 35, 9–17.  [https://pdfs.semanticscholar.org/b1ff/13bd88a92a73938ad9b84b88d037a944a27d.pdf](https://pdfs.semanticscholar.org/b1ff/13bd88a92a73938ad9b84b88d037a944a27d.pdf)


6. CONCLUSION: OFFERING OTHERS THE BEST OF OURSELVES

Human life is changing at an ever-increasing speed, and huge challenges that we thought we had years to prepare for, have turned out to be even closer than expected, often overwhelming us with surprising force. It is no exaggeration to say our species faces an existential crisis and we must commit ourselves each day to improving the quality of our own lives and those of others. Unfortunately, mainstream education was developed in a different era, often leaving us feeling under-equipped for today’s challenges. For this reason, now more than ever, it is necessary to educate ourselves and others utilizing the guiding light of scientific based education to become more self-aware, kind and compassionate, and at peace with ourselves and others much as Montessori education does. Looking to the future with hope, perhaps we might focus on putting the human being back at the center. Putting humans at the center means focusing on the inner landscape and creating a new balance between this and our relationship with the planet. Our short-sightedness has caused conflicts to multiply and diversify, directly affecting the lives of each of us. We must become able to not lose ourselves in the middle of these conflicts and create spaces of peace within ourselves, and in our environments, so that from a place of inner peace we can achieve truly lasting peace also with others and with the natural world.

The neuroscientific and psycho-pedagogical research of the Patrizio Paoletti Foundation wants to contribute to providing scientifically validated tools that make a difference in everyone’s life, from the smallest to the largest, in a constant process of lifelong learning, in which learning represents the way of growth and transformation for everyone. In this way we will be able to authentically offer ourselves and others the best version of ourselves and make a significant contribution.

Focusing exclusively on training cognitive skills is less efficient, and ultimately less successful, than also addressing children’s emotional, social, spiritual, and physical needs.\textsuperscript{10} If a child is stressed, sad, lonely, or not physically fit, the very

\textsuperscript{10} e.g., Diamond, A., Lee, C., Senften, P., Lam, A., & Abbott, D. (2019). Randomized control trial of
academic performance a school is trying to improve will take a hit. We have to care about children’s emotional, social, and physical well-being if we want them to be able to creatively problem-solve, exercise self-control, or display any of the other executive functions.¹¹ Embarrassing a child, making a child feel ashamed because of a mistake, is counterproductive.¹² Making mistakes is part of learning and improving; we should celebrate when any child has the courage to try and challenge him- or herself. We should encourage community and children helping one another in class. We should show all children, regardless of their physical or economic handicaps, that we see them, we value them, we respect them, we have unshakeable confidence in their ability to succeed, and we have their back.


7. REFERENCES

- Armed Conflicts Location & Event Data Project, https://acleddata.com


PATRIZIO PAOLETTI

Patrizio Paoletti is the founder of the Research Institute in Neuroscience, Education and Didactics and the Paoletti Foundation for Development and Communication. Paoletti developed the Sphere Model of Consciousness, which has recently been considered the most advanced neuro-phenomenal model for consciousness. His research interests include the investigation of “consciousness-in-itself”, self-awareness and its neurophysiological correlates; sensorimotor paradigms aimed at the development of attention and will abilities, and their educational applications. In the educational field, through his many educational projects, Paoletti promotes a global approach to human development in terms of bodily experience, regulation of emotions, enhancement of attention and self-awareness. The neuroscientific investigation of Paoletti and his Foundation aim to provide scientifically validated education-tools, for different age groups ranging from children to adult education, as well as for professionals of education and non-specialized audience. Paoletti’s Foundation Vision is embodied in an education for Peace and Awareness as indispensable values for the future of humanity.

ADELE DIAMOND

Adele Diamond, PhD, FRSC is the Canada Research Chair Tier I Professor of Developmental Cognitive Neuroscience at the University of British Columbia (UBC), Vancouver, BC, Canada. A member of the Royal Society of Canada, she has been named one of the “2000 Outstanding Women of the 20th Century” and has been listed as one the 15 most influential neuroscientists alive today. She was educated at Swarthmore (BA, Phi Beta Kappa), Harvard (PhD), and Yale Medical School (postdoc). Her research focuses on the cognitive control functions collectively called executive functions, dependent on prefrontal cortex, including the neuroanatomical, genetic, and neurochemical mechanisms that make those functions possible and how these functions are modulated by the environment. Her research interests include the roles of storytelling, dance, music, physical activity, and mindfulness in improving executive functions and academic and mental health outcomes. She has thought deeply and written about interrelations between cognitive and perceptual-motor development. In the field of education, her research is showing that focusing exclusively on training cognitive skills is less efficient, and ultimately less successful, than also addressing emotional, social, spiritual, and physical needs.