Enhancing Safety and Performance in Paragliding: The Role of SIV Training Supported by Science

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Introduction

Paragliding challenges the mind and body, demanding physical abilities and deep psychological resilience. Pilots must interpret external conditions and manage internal emotional and physiological states. To help pilots develop these skills, a specialized course known as “SIV” (Simulation d'Incident en Vol, or "Simulation of Incident in Flight") has become a critical part of training. First introduced in the late 1980s by Swiss paragliding instructor Urs Haari and French pilot Luc Armant, SIV training was developed to prepare pilots for potential in-flight incidents, from collapses and stalls to spins. They developed a structured course that involved intentionally inducing these incidents in a controlled environment over water, allowing pilots to learn essential recovery techniques and gain valuable experience handling their wing in critical situations. By practicing these scenarios, pilots gain the experience they need to handle critical situations and build confidence in their ability to recover safely.

The first SIV courses were held in Switzerland and France in the early 1990s, and the concept quickly gained popularity worldwide as a crucial element of paragliding safety training. Today, SIV courses are conducted in many countries and are highly recommended for pilots of all levels, from beginners to experienced pilots.

This article puts forward the premise that these courses are not merely an optional enhancement to a pilot’s training but an essential component that enhances a pilot's ability to fly and excel at navigating the complexities of the skies.

While this article dives deep into human physiology and the psychology involved in critical situations, the author hopes the information is accessible and beneficial to pilots of every level of experience. Knowing how SIV works can help maximize the benefits of instruction and focus the student on achievable goals and the best results.

Towards that end, what are the core goals of an SIV course? A proper SIV course should equip pilots with essential safety skills to navigate the thin line between an ideal state of autonomic arousal, which is, in theory, being relaxed yet alert, versus a potentially paralyzing, maladaptive stress response that could result in injury or death.

A certified SIV course should emphasize the development of the following three categories. The first category is working towards adapting the sympathetic nervous system to reduce future threat reflex activation using controlled exposure to stressors pilots might encounter during flight. Secondly, when learning new motor skills, students should dissect the three main branches of the learning process: (1) the movement itself while absorbing its fundamentals, (2) sensory perception, including where to look, what to focus on, and what to listen for while working toward acquiring the new skill, and (3) the necessary proprioceptive awareness to execute the maneuver properly. Incrementally growing the student’s *proprioceptive awareness* through tailored exercises is meant to allow an adaptation to what, for most evolving pilots, is a rather alien environment.

This last category, *interoceptive awareness*, is the most essential. It is the ability to perceive internal bodily sensations, which is crucial for managing physiological responses to fear and stress during flight. By enhancing this awareness, pilots can differentiate between rational

versus irrational fear, make more informed decisions, manage their emotions effectively, and thus significantly improve safety and performance. For example, a qualified SIV instructor should redirect the students' focus inward by asking them to monitor their physical and emotional reactions while learning, as opposed to mainly focusing on their equipment behavior and external stimuli.

SIV also serves as a practical application of theoretical knowledge, providing pilots with opportunities to practice real-life maneuvers in a controlled environment. This includes recovery techniques, energy management, wing control, and descent techniques. This training is instrumental in developing flying skills and mental acuity under pressure, creating an essential feedback loop that reinforces learning and adaptation. Such preparation is indispensable for safely handling unexpected situations in the air. The ultimate learning goal should be to promote a holistic approach to paragliding, which includes melding mental, physical, and emotional preparedness into a cohesive skill set.

This paper highlights the elementary role of cultivating these three main categories and their profound impact on the effectiveness and safety of paragliding. We aim to demonstrate how such practices can transform fear from a hindrance into an enabling catalyst that drives learning and behavior into safer and more rewarding flying experiences. We also aim to end the eternal debate on whether an SIV should be integrated as a requirement for all pilot training protocols and discover how it is necessary for every pilot's safety.

Why Take an SIV?

An SIV course extends beyond merely a set of maneuvers or recovery training exercises within a controlled environment; it represents an essential psychological conditioning platform akin to exposure therapy used in clinical settings. While the course is instrumental in mastering technical skills like recovery techniques, energy management, wing control, and descent techniques, more importantly, it catalyzes a key adaptation of the pilot's sympathetic nervous system. Training these skills allows a pilot to wire the correct neural pathways to react correctly and confidently.

In exposure therapy, repeated controlled exposure to the sources of anxiety aims to desensitize an individual's reaction to stressors, ultimately reducing their impact. Similarly, an SIV course repeatedly exposes pilots to high-stress flying conditions and simulated in-flight incidents. This repeated exposure helps to recalibrate the pilot's automatic stress responses. By recursively encountering these controlled "threats," a pilot's sympathetic nervous system, which mediates immediate reactions to perceived harm or threats, gradually becomes less reactive to such stressors in actual flight conditions. The goal is to reduce the likelihood of a heightened threat reflex activation (which could lead to panic and poor decision-making) under unexpected flying conditions to more adaptive reactions, leading to safer outcomes. Interestingly, after a certain amount of SIV training, some pilots begin to enjoy these extreme situations and look forward to inducing certain scenarios like spins and stalls or may begin working on acrobatic maneuvers, which would have had them terrified not so long ago.

Importance of Practical Training Over Theoretical Learning

As the paragliding community continues to promote safety amongst its pilots, a specific behavior has been observed that could unknowingly jeopardize pilots. With online access to seemingly unlimited information, many pilots immerse themselves in instructional videos, articles, and recommendations put forward by legitimate instructors and pilots who may not have much more training than the viewers themselves! Pilots immersing themselves into this world can produce a false "sense of security" based on theoretical knowledge that's never been put into practice firsthand. Watching an online video of an instructor stall and recovering a wing isn't the same as doing it yourself. For many pilots, this type of training results in a state of confidence that can be more dangerous than they have ever been exposed to.

A good example of practical training being significantly better than theoretical learning is the immediate experiential feedback the pilot receives during guided training. An example is when learning wingovers, an acrobatic maneuver that requires the pilot to be aware of the wing's behavior in the three axes (pitch, roll, yaw) and time their inputs in such a way as to keep the wing in a flying configuration. During this training, instructors try to teach students in a closed loop versus an open loop. When the maneuver is executed in an open loop (where students stop every time they experience a deflation and must start over from the beginning), they are likelier to experience the same deflation in the maneuver again. However, in a closed-loop system, students are encouraged not to stop and start over but instead to keep going and use that small deflation as immediate feedback. This allows for more repetitions and allows the student to apply corrections on the go. If, on the next wingover, their deflation is smaller in size but persists by keeping it in a closed loop, they can apply these corrections in an incremental and continuous maneuver until they stop experiencing the deflation. This is a prime example of how practical training differs from pure theoretical learning.

The Limitations of Theoretical Learning

Theoretical knowledge and mental training, including visualization techniques, activate similar neuronal pathways as physical execution, such as upper and lower motor neurons (Shah, 2024). Visualization training can still be a great addition to the training protocol once an intermediate level or above is reached to significantly increase speed and accuracy during the execution of the specific maneuver. However, ultimately, the training must be put into practice in the real world.

Relying solely on passive learning methods can lead to a dangerous illusion of mastery—what one might call the "I've got this" syndrome, which is usually not supported by a solid foundation of skills. This false sense of security is risky, as it may lead pilots to overestimate their abilities and potentially put themselves and others at risk in challenging conditions. While practicing new skills using mental training and slow-motion visualization, we become too focused on positive outcomes and scenarios and deprive ourselves of the opportunity to make mistakes. Errors are fundamental to generating neuroplasticity, which is the backbone of any learning process. The belief that one is fully prepared without substantial hands-on practice is misleading and can be fatal. Hands-on training is irreplaceable for developing and refining the motor skills necessary to reduce risk. Pilots can genuinely understand and react appropriately to the dynamic nature of flying through actual flight experience and guided practical exercises, such

as those offered in certified SIV courses (as opposed to courses operated by non-certified instructors who may do more harm than good). These practical experiences allow pilots to integrate their theoretical knowledge with real-life flying skills, significantly enhancing their reaction times and precision in acute situations. These two techniques help pilots fly safer and enjoy the sport more.

Technological Advancements and Training Necessity

Recent advancements in gliders enhance passive safety and reduce the frequency of incidents like cravats or tangled and twisted canopies; however, the necessity for SIV training remains undiminished. Modern paragliders are more stable and forgiving, but no technological advancement can eliminate the risk of severe in-flight incidents. No paraglider will prevent a pilot from making poor choices. Thus, training to handle such rare but possible events remains vital. Pilots must be familiar with recovery skills to manage these situations when they arise effectively. SIV courses serve a dual function in a pilot's development: they enhance technical maneuvering skills and, more fundamentally, recalibrate the pilot's psychological and physiological responses to stress and emergency scenarios.

Transforming Innate Defense Mechanisms

Human evolutionary biology has equipped us with specific instinctual defense mechanisms vital for survival. Still, they can become maladaptive in non-natural environments, such as when flying a pendulum aircraft like a paraglider. A quintessential example is the instinctive human reflex to grasp tightly onto something when experiencing a vertical drop (like grabbing a branch if falling off a tree). In paragliding, this reflex manifests as a pilot gripping the brake toggles in a panic during unexpected vertical drops or accidental stalls, preventing the wing from returning to its normal flight configuration.

Pilots can learn to override these primal reflexes through structured SIV training and maintain or re-establish control. For example, training focuses on inducing stalls deliberately in a safe environment, which forces pilots to confront and manage their instinctual urge to "hold tight" to the brake toggles or risers, essentially turning themselves into passengers. By repeatedly practicing the correct techniques to recover from self-induced stalls and other complex situations, pilots can rewire their responses to be more adaptive for flying. They learn physically and psychologically to perform counterintuitive actions that maintain or regain canopy control, which is imperative for paragliding.

Necessity of Stall Training in Paragliding

In recent years, as modern gliders promise enhanced stability and safety, several instructors have been led to believe that stall training is no longer necessary, perhaps because these instructors need to understand their aircraft completely. Some have even labeled the need to learn stalls as propaganda. However, the assumption that stall training is becoming less necessary needs to be revised. Despite advancements, understanding and managing stalls remains crucial for pilots to ensure safety and enhance their skills in handling unexpected situations. Some SIV instructors have stopped teaching stalls on lower aspect ratio gliders and think pilots should only learn how to do a stall when they start flying a two-liner. In contrast to these beliefs, logic states

that a stall should first be approached and understood on a low aspect ratio glider, and the training should evolve with the pilot throughout different glider classes.

Stall maneuvers are not just about managing the glider when it is not in a desirable flying state; they are about understanding the full spectrum of its behavior in various conditions while in the air. Training pilots to induce and recover from stalls is fundamental because it teaches them the limits of their equipment and how to handle extreme scenarios. This knowledge is vital for enhancing overall flight safety.

Another critical aspect of stall training is learning to control instinctive reactions. For instance, if a pilot experiences a sudden drop, the natural response might be to grab and hold onto the brakes tightly. This reaction could worsen the situation by causing the glider to descend uncontrollably – for example, accidentally turning a benign frontal collapse, where a portion or even the entire wing folds in upon itself, into an unexpected stall by applying brakes when experiencing a sudden vertical drop. Stall training helps pilots manage these instincts and teaches them to respond correctly by releasing the brakes, allowing the glider to recover smoothly.

Full stall practice also prepares pilots for emergencies, like cravats, when they are too big to be cleared with all other cravat clearance tools (pumping the brakes, utilizing the stabilo line, or spins for more advanced pilots). Knowing how to execute a controlled stall and recovery can disentangle the wing and regain proper control, which can be lifesaving. Learning to stall a glider shows that you have control of your wing from zero airspeed to full airspeed and have a good understanding of the flight of your glider. Stall training in paragliding needs to be accepted as essential by the flying community. The assertion that stall training is becoming less necessary is wrong.

Why Should a Pilot Deploy Their Reserve on Their First SIV?

Deploying a reserve parachute in a controlled environment under the supervision of a qualified instructor is not just a safety practice but a skill that empowers the pilot. This experience is important for several reasons. Throwing a reserve in a controlled setting allows pilots to become intimately familiar with their gear in a non-critical environment. Mastering how and when to deploy the reserve parachute can reduce hesitation and increase confidence, which are vital in emergencies.

Practicing deployment in an SIV setting helps mitigate the fear of the unknown. Fear can significantly impair a pilot's ability to act under stress, mainly if they are unsure about the functionality or outcome of using their reserve parachute. By experiencing what it feels like to deploy the parachute, a pilot can reduce the panic that might arise from not knowing what to expect. In high-stress situations, the ability to perform actions automatically without conscious thought can be lifesaving. Deploying the reserve parachute in a calm environment helps ingrain this essential skill. Exposure to a simulated emergency in a safe environment allows the pilot to experience some level of stress in a controlled manner, which can help them manage real-life stressors more effectively. It will enable pilots to understand their personal reactions and

limitations under stress. This self-knowledge is essential for developing strategies to cope with emergencies.

It is also important to know that for certain individuals, practicing parachute deployment on a simulator (hanging from a tree, etc.) may not be sufficient to ensure they will deploy it in a real-world crisis. Simulated conditions can never perfectly replicate a real emergency's high adrenaline and looming panic. The intense stress of a genuine crisis might overwhelm learned behaviors from a simulator. People vary in their physiological and psychological responses to stress. Some may experience a freeze response despite having practiced on a simulator, particularly if they have a history of trauma or anxiety. Practicing on a simulator might make some pilots feel overconfident about their ability to handle emergencies, leading to complacency and a lack of appropriate response when a real crisis occurs.

While practicing a reserve toss while hanging from a simulator remains invaluable, all pilots should throw their reserve during their first SIV session instead of postponing it for all the wrong reasons. Avoiding salty water or the instructor's desire to send students home dry and happy aren't legitimate reasons not to develop this skill.

This training protocol helps students learn how and where to throw and disable their canopy to avoid down-planing and prepare for impact. It is designed to help pilots prepare for the unexpected and act decisively under pressure, increasing their likelihood of effectively deploying their reserve parachutes during an emergency. This protocol should be part of a comprehensive training regime that includes psychological preparation and scenario-based training.

Using Sensory Perception to Improve Motor Skill Learning

An SIV instructor should be able to design a teaching method that directs student attention by focusing on the different sensory feedback loops associated with each maneuver. For example, knowing where to look while working on pitch-pendulum maneuvers will increase spatial awareness, which is fundamental when flying a paraglider.

Pitch-pendulum, or surge control, is a very underrated tool. For those unfamiliar with the maneuver, the wing is initially slowed, and the pilot swings like a pendulum underneath and forward of the wing. At the limit of this swing, the wing is released and flies forward again. By repeating this cycle, energy builds, and the oscillations grow bigger and bigger. The pilot's inputs must be timed and controlled in such a way that the wing is never allowed to collapse.

Initially, the fundamental reason for teaching pitch pendulum was to allow the pilot to familiarize themselves with one of the three axes—the pitch—and learn how to check and control surges while learning about energy management. There is a new awareness of the importance of utilizing this underrated but incredibly useful maneuver. When taught and executed correctly, this exercise can significantly enhance a pilot's spatial awareness by emphasizing the importance of sensory perception. The exercise would require pilots to pay close attention to various sensory inputs, such as visual cues, the feeling of pressure changing in the harness, and the sound of the wind and wing. By focusing on these different aspects, pilots

learn to use their senses comprehensively to interpret the glider's state and their body position in space.

The instructor is pivotal in guiding pilots to shift their focus during different sessions to emphasize one sensory input at a time. For instance, one session might focus on visual inputs, such as observing the horizon or the wing's behavior. Another session could concentrate on tactile feedback, like feeling the pressure in the harness or the brakes. Another aspect of this new awareness is isolating and integrating these sensory cues. Pilots will develop a more nuanced understanding of how their actions affect the glider's behavior. This enhanced perception helps recognize spatial relations and the glider's orientation relative to space, which is crucial for maintaining control and stability. While improving reactivity, pilots become more attuned to their sensory inputs. They can react more quickly and effectively to changes in glider behavior. This enhanced reactivity boosts confidence and contributes to safer flying practices.

Continuous practice of the pitch pendulum exercise, with a shifting focus on different sensory inputs, allows pilots to integrate these perceptions into a coherent understanding.

This "shortcut" in training accelerates the development of spatial awareness, making pilots more adept at managing complex flight dynamics. Ultimately, this methodical approach to sensory training in paragliding harnesses the brain's ability to process and react to multiple streams of information, turning the pitch pendulum exercise into a powerful tool for enhancing a pilot's spatial awareness and overall flying skills. This creates the habits necessary for good reactions; the thinking process can skip steps as your body feels what to do.

Proprioceptive Awareness

Proprioceptive awareness is the body's ability to sense its position, movement, and orientation in 3D space, enabling coordination and balance without conscious effort. It relies on sensory receptors in muscles, tendons, and joints to provide information about body positioning and movement. Proprioceptive awareness is imperative when flying a paraglider because it allows for real-time assessment of one's body position. This is essential for maintaining balance and control while airborne. In paragliding, the pilot's body acts as a primary control initiator, manipulating the paraglider's canopy by shifting weight. This weight shift is not arbitrary; it requires precise movements to alter flight direction. It is a dance of the mind, body, and environment unparalleled by any other sport.

Proprioceptive awareness allows pilots to feel the position of their body in relation to the paraglider and make nuanced adjustments that are critical for a smooth and safe flight. For example, to initiate a turn, a pilot must lean into the desired direction of the turn. The amount of lean and the timing of the weight shift must be finely tuned based on the pilot's proprioceptive feedback. Too little, too much, or poorly timed shifts can lead to suboptimal turns or even loss of control. In dynamic aerial environments, where rapid responses are often needed, a well-developed proprioceptive sense ensures that these responses are both quick and appropriate, enhancing safety. Pilots with good proprioceptive awareness are more likely to handle unexpected situations calmly and efficiently, reducing the risk of accidents. Therefore, proprioceptive awareness is not just important—it is essential for the effectiveness and safety of

flying. A pilot cultivating well-developed proprioceptive awareness is on the right track to becoming an effective active pilot. Regular training and exercises that enhance body awareness can significantly improve a pilot's performance.

Proprioceptive Awareness Growth Tools

When pilots execute maneuvers like pitch pendulums and wingovers in a controlled environment, they are not just flying but engaging their brains in an arduous workout. The magic happens through a process called self-directed and adaptive neuroplasticity, which is the brain's incredible ability to rewire itself based on experiences and environmental stimuli.

It might feel frustrating or agitating when we make mistakes or encounter errors while trying to acquire new flying skills. However, these feelings are powerful signals to the brain to ramp up its neurochemical production, particularly acetylcholine and norepinephrine **(**Sam et al., 2023). For example, when you hit a snag or falter during a maneuver, your brain goes into overdrive, flooding the relevant regions with these neuromodulators (thanks to that frustration and agitation). This heightened chemical activity leaves a "chemical stamp" in those brain regions involved in learning.

Now, here is where the magic happens. During deep sleep cycles, the brain undergoes synaptic pruning, deactivating the surplus of unnecessary neural connections and refining and strengthening more useful ones (Wang et al., 2011). Those chemical stamps left behind by the heightened neurochemical activity help guide this pruning process **(**Smith et al., 2023). When you wake up after a restful sleep, your brain has sifted through all those experiences and errors, keeping only the correct sequences and refined movements necessary for mastering the movement one was working on. Your brain performs its quality control check, leaving you only with the essential connections for precise execution.

When pilots repeatedly perform these maneuvers, their brains kick into high gear, fine-tuning the neural pathways responsible for motor skills. When the vestibular sense (which governs balance and spatial orientation) is involved in the learning process (like during these maneuvers), there is an even higher level of plasticity at play (Cullen, 2012). The cerebellum, the brain's coordination center, is flooded with neurotransmitters like acetylcholine and norepinephrine (Cullen, 2012). These chemicals act like supercharged fuel for learning, making the brain more receptive to refining those flying skills at lightning speed. Pilots hone their proprioceptive awareness, increasing control of their paragliders and leveraging the brain's incredible ability to adapt and excel.

It is also important to mention that dopamine plays a role in enhancing plasticity. When learning a new skill, mistakes and errors are triggers to move forward and learn how to improve. The release of dopamine is an additional ingredient to the recipe for each positive outcome learned, no matter how minor or significant. Learning to embrace the frustration from mistakes could further increase dopamine release. It is like a perfect storm of skill-building in the sky, all thanks to the precise execution and teaching methods tailored to enhance proprioceptive awareness. Motivation remains the key ingredient to trigger any plasticity in the learning

process. How much you want and need it will always remain the leading catalyst when learning any new motor skill, regardless of age.

Cultivating Tools for Managing Fear In Paragliding

Interoceptive awareness is the mindful perception of internal bodily sensations**.** Cultivating interoceptive awareness in paragliding for effective fear management is vital for maintaining an appropriate state of autonomic arousal.

Paragliding demands high levels of mental and physical coordination, where pilots must interpret external conditions while also managing their internal emotional and physiological states. Fear is a common emotion in this sport since running off a mountain with a paraglider goes against all human instincts and evolution, which focus on survival and reproduction. This is why we enter fight or flight to a different degree (according to our experience and level of exposure) each time we step onto a takeoff. Fear can positively act as a protective mechanism or negatively as a performance inhibitor if not correctly managed.

Enhanced interoceptive awareness helps pilots understand the physiological signals of fear, such as an increased heart rate, rapid breathing, and muscle tension. By becoming more attuned to these cues, paragliders can differentiate between normal physiological responses to excitement and those signaling real danger. The sooner the pilot recognizes the early cues, the sooner they can act on them. This ability is crucial as it allows for appropriate fear responses, enabling pilots to recognize when it is safe to push limits and when it is wise to take conservative actions—furthermore, the development of interoceptive awareness aids in emotional regulation.

Practices such as mindfulness and focused breathing enable individuals to modulate their fear responses effectively. For example, controlled breathing not only aids in maintaining calmness but also stabilizes the heart rate and reduces panic, facilitating better decision-making while in flight. This skill is particularly significant in paragliding, where panic-induced errors can lead to severe accidents. Effective fear management through interoceptive awareness enhances critical cognitive functions in paragliding, such as attention, problem-solving, and decision-making. A paraglider in tune with their internal state is more likely to maintain focus, accurately assess risks, and make judicious decisions about navigation and managing unexpected challenges in the air. Additionally, training in interoceptive awareness can improve a paraglider's progression and learning.

By understanding and regulating their fear, pilots can approach learning with a more constructive and less avoidant attitude. This speeds up skill acquisition and assists in overcoming performance plateaus associated with fear-induced avoidance behaviors. Cultivating better interoceptive awareness offers substantial benefits for paragliders by enabling more effective fear management. Incorporating interoceptive training into regular preparatory routines could be profoundly beneficial for paragliders aiming to optimize their performance and enjoyment of the sport. A heightened interoceptive awareness also facilitates processing one’s intuition. It will help strengthen one’s ability to trust one's gut feelings, which is the fine bridge between the conscious and subconscious mind (Hamann, 2009). Through such practices, paragliders can transform fear

from a hindrance into a navigational tool that informs safer and more rewarding flying experiences.

Working on the Ideal SIV Mindset

Sense of Control

In several ways, a sense of control is our most potent ally while flying and can positively impact stress management during paragliding. When paragliders feel in control, they have a greater situational awareness—feeling in control results in more brain power to assess the current situation around them. They can evaluate potential hazards, which helps them anticipate and prepare for any challenges. This assessment reduces uncertainty and promotes a more focused and proactive mindset, reducing stress levels. Pilots can make informed decisions based on the situational assessment when in control. They can choose when and if to launch, select appropriate flight paths, and adjust their techniques accordingly. This ability to make decisions empowers pilots and gives them a greater sense of agency, reducing the anxiety and stress associated with feeling helpless or out of control.

When in control, pilots can maintain an ideal state of arousal where skills and challenges are well-matched, allowing full engagement in the flying experience. This focused mindset reduces distractions and promotes a sense of calm and control, mitigating stress levels. It also increases confidence and self-efficacy in paragliders. When one believes in one's ability to handle the demands of flying, one is more likely to approach challenges positively. This confidence reduces performance anxiety and promotes a sense of control over one's emotions, leading to better stress management.

It is important to note that a sense of control should be balanced with a realistic assessment of one's abilities and environmental conditions. Paragliders should prioritize safety and not take unnecessary risks based solely on a perceived sense of control. Regular training, self-awareness, and adherence to safety protocols are crucial for effective stress management in paragliding. Taking an SIV course does not reduce or eliminate the need for good flying decisions.

False Sense of Control and Associated Trauma

When people overestimate their skills or abilities (the well-known overconfidence topic and the danger deriving from it), they might take on tasks or situations beyond their capacity (Dunning–Kruger effect 2024). This mismatch can lead to accidents or failures, which are often unexpected and shocking. When reality sharply contradicts their self-perception, it can be traumatic. This trauma is not just from the accident itself but also from the realization that their beliefs about their abilities were incorrect. This experience can undermine their confidence and sense of control, leading to more distress.

Reappraising our stress responses

Pilots often face high-stress situations that can trigger physical symptoms such as a racing heart, sweaty palms, and a churning stomach. This is a heightened fight-or-flight state. It is easy to interpret these signs as harbingers of impending failure, a viewpoint that can further

exacerbate stress. Viewing stress as a debilitating belief can undermine performance by convincing you that if you were genuinely competent and well-prepared, you would not be experiencing such anxiety. That could also throw a pilot into a metacognitive loop of being stressed about being stressed.

Psychologist Alia Crum's "stress-can-be-enhancing" theory (Crum, 2024) provides an empowering alternative way to view these physical responses. This perspective encourages seeing stress symptoms as indicators that your body is energizing to meet a challenge. For instance, a racing heart is your body pumping more oxygen-rich blood to the brain and muscles, priming them for peak performance.

Using Elizabeth Crum's theory, the following is a guide to help pilots reappraise their stress.

Reappraising Stress: A Guide for Pilots

1. **Recognize Your Stress Signals:** Understand that physiological responses like a racing heart or sweaty palms are natural and familiar. They are your body's way of preparing you for action, not signs of incompetence.

2. **Reframe the Experience**: Instead of viewing these symptoms as threats, interpret them as your body's support in rising to the challenge. This shift from a threat mindset to a challenge mindset can reduce the fear of stress and transform your experience.

3. **Implement the "Stress-is-Enhancing" Belief:** Embrace the idea that stress can improve cognitive and physical performance by providing additional energy and sharper focus. Remember, stress is a tool that can help you perform under pressure.

4. **Prepare with Positive Action:** Rather than withdrawing to avoid stress, engage in proactive behaviors that prepare you for the task. Use your stress as a cue to concentrate on preparation and practice.

5. **Practice Mindfulness and Controlled Breathing:** Develop mindfulness meditation or controlled breathing protocols to manage stress responses and maintain calm. These techniques can help you stay centered and composed.

6. **Reflect on Past Successes:** Think about times you have successfully managed challenging situations. Reflecting on these can boost your confidence and reinforce the belief that you can handle stress effectively.

Remember, being prepared and confident includes harnessing the energy that stress provides. That said, even after applying all the strategies mentioned, if you still cannot gain the relaxed but alert state of autonomic arousal, you should step aside until you are ready.

Harnessing Stress for Growth - A Paraglider's Perspective

Harnessing stress for growth, understanding, and reinterpreting stress response can significantly improve our performance in paragliding, particularly during demanding situations

like those we face in SIV training. This strategy was introduced in Let Fly Paragliding's SIV course five years ago, and it has proven highly beneficial for students.

In physical exercises, such as weightlifting or running, the body signals its growth in tangible ways, like muscle soreness from lifting or the burn in your lungs from a hard sprint up a hill. These sensations are not just signs of exertion; they are indicators of adaptation. Our bodies are gearing up to perform better the next time under similar stress. The brain works similarly, though it could be more intuitive. When faced with mental challenges—learning a new maneuver in paragliding, mastering turbulent conditions, or handling emergencies—our initial confusion and feeling overwhelmed are not signs of failure. Instead, they are signs that we are pushing our mental capacities and triggering growth through neural plasticity.

Bridging Physiology and Mindset

Just as our muscles adapt to physical stress, our brain adapts to cognitive and emotional stress. This adaptation is central to developing what we refer to as a "growth mindset." Carol Dweck, a psychologist, highlighted the importance of "effort beliefs" in her research on growth mindsets. Effort beliefs are the understanding that difficulty does not imply incapability but rather an opportunity for development. Navigating terrain in a vibrant environment or executing a tricky recovery maneuver during an SIV could feel overwhelming. That feeling is your 'lung burn' and your brain signaling it is time for adaptation and learning.

Practical Application in SIV Training

During SIV courses, you might repeatedly fail to execute a maneuver correctly. Each failure, however, is not a signal to quit but a cue to persevere. Just as a runner pushes through the burn to increase stamina, a pilot should embrace these challenging moments, understanding that this stress sculpts their skills and instincts while increasing their resilience.

Reappraising Stress in Flight

When confronted with intense situations, the typical response might be to retract or feel defeated by the anxiety and confusion. However, by reappraising these responses—as growth signals, we can transform them into learning moments.

First, you want to acknowledge the challenge and recognize when you feel overwhelmed—your brain's way of noting that you are facing something challenging. Next is to normalize the stress. Understand that stress is a normal response, not a deterrent. This perspective shift is crucial—it's not a red flag but a marker of where your limits lie and where growth can occur. Last, embrace the effort and push through the difficulty with the knowledge that this effort is expanding your capabilities, just as lifting more weights builds muscle.

In this sport, every flight is a lesson, and every challenging condition is a question nature poses. How you answer these questions, by engaging with the challenge or retreating from it, shapes your flying skills and overall approach to any stressor in life. Remember to approach each stressful moment with the question, "What can I learn from this?" rather than, "Can I do this?" Shift from a fixed to a growth mindset and watch not only your skills expand but also your enjoyment of every flight.

A Call to Action for All Pilots

Taking a certified SIV course incorporates the holistic approach of adapting the sympathetic nervous system and developing proprioceptive and interoceptive awareness. Cultivating this awareness through SIV training not only equips pilots with the skills to discern and regulate their emotional and physiological responses in real time but also enables them to make informed decisions that affect their performance and safety. Therefore, SIV is not just supplementary but integral to comprehensive paragliding training, providing a structured environment where theoretical knowledge is tested and applied practically. This blend of awareness and applied practice helps paragliders transform their approach to the sport, turning potential fears into powerful allies that inform better, safer flying practices.

All paragliding pilots are strongly encouraged to complement their theoretical studies with robust, practical training. They should regularly engage in structured, hands-on practice sessions and enroll in continuing education courses such as SIV training and flight clinics with qualified and certified instructors, not pilots who are merely self-proclaimed experts.

Ultimately, this holistic approach combines physical skills with cognitive and emotional management techniques. Such an approach promotes enhanced safety and performance and contributes to the overall professionalism and enjoyment of the sport, encouraging pilots to fly with insight and control.

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