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Addressing the Target Outcomes, Functional Objectives and Functional Skills of Aspiring Aviators in Individualized Education Plans and Section 504 Plans

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Abstract

The Federal Aviation Administration (FAA) has very specific requirements for individuals with Attention Deficit Hyperactivity Disorder (ADHD) that center around the executive function abilities of individuals without the aid of ADHD medications, which are forbidden for use by the FAA. These abilities are evaluated by the FAA's medical examination process, which involves a background investigation into a person's history. K-12 Administrators and educators can assist young aspiring pilots with ADHD by placing aviation-specific functional educational goals in their Individualized Educational Plans (IEPs) and Section 504 Plans.

Keywords: ADHD, FAA, pilot, Individualized Education Plans, Section 504 Plans, FAA medical exam

Introduction

Becoming a professional pilot requires many years of training and study in addition to completing multiple milestones. Those steps are laid out by the Federal Aviation Administration (FAA) in Federal Aviation Regulation 14 C.F.R. Parts 61 and 141 (Certification: Pilots, Flight Instructors, and Ground Instructors, 1997; Pilot Schools, 1997). The very first step is to acquire a private pilot license. This step is often the hardest step for aspiring pilots and many pilots do not complete it. Common reasons include the rigors of flight training and extremely high costs. Flight training can pose a barrier to aspiring pilots with Attention Deficit Hyperactivity Disorder (ADHD), who can struggle with completing tasks that take large amounts of patience and focus. However, there are challenges in becoming a professional pilot that are unique to neurodivergent student pilots with ADHD that are not commonly understood by special education case managers (which can even include those at K-12 schools with an aviation career focus), as well as by most

Certified Flight Instructors (CFIs). Furthermore, the FAA has a very unique set of neurological testing requirements for pilots that have been diagnosed with ADHD, the results of which have resulted in some certificated pilots losing their licenses.

The FAA's aeromedical regulatory framework regarding ADHD is completely motivated by preventing accidents. NTSB investigations have shown a disproportionate number of pilots exhibiting ADHD symptoms with plane crashes (Laukkala et al., 2017). Other research has shown that teens and young adults with ADHD are 14 times more likely to be involved with motor vehicle accidents than other teens (Chang et al., 2017). However, there are active pilots with ADHD diagnoses in the civilian, military, ultralight, small unmanned aerial systems (sUAS), and light sport aircraft communities that are safe pilots. This is evidence that people with ADHD can become pilots with the right set of coping/management mechanisms and strategies.

This paper will attempt to identify all issues that can cause aspiring pilots with ADHD to encounter setbacks that keep them from both completing flight training and getting certificated. It will then seek to identify aviation-specific strategies and accommodations that should become a part of the Individualized Educational Plan (IEP) or the Individuals with Disabilities Education Act (IDEA, 1990) Section 504 Plans of students with diagnosed ADHD that take into account that the student is an aspiring pilot and that prepares the student for flight training, FAA certification, and the subsequent steps to becoming a professional pilot. It will be intended to serve as a guide to special education teachers, curriculum planners, school administrators, CFIs, pediatricians not familiar with FAA requirements, professors, and department chairs of colleges with 14 C.F.R. Part 141 certified flight training programs, FAA administrators, and students with ADHD (Pilot Schools, 1997).

The focus will be on the student that aspires to become an airline pilot. But there are other pathways to flying professionally, and some of them are more "ADHD-friendly." For example, commercial glider pilots and flight instructors of light sport aircraft do not require a medical exam and therefore would not have the same medication considerations as becoming an airline pilot.

List of Abbreviations

ADHD - Attention Deficit Hyperactivity Disorder

ATC - Air Traffic Control

CFI - Certified Flight Instructor

CFR - Code of Federal Regulations

DWI - Driving While Intoxicated

DNF - Do Not Fly (A list of prohibited FAA medications)

DNI - Do Not Issue (A list of prohibited FAA medications)

FAA - Federal Aviation Administration

14 CFR – Title 14 of the Code of Federal Regulations: Aeronautics and Space

IDEA - Individuals with Disabilities Education Act

IEP - Individualized Education Plan

sUAS - Small Unmanned Aerial Systems

An Overview of the FAA's Aeromedical Requirements for People with ADHD

The FAA requires all individuals that are seeking a license to fly general aviation aircraft, which includes airplanes, helicopters, gyroplanes, hot air balloons and airships, to take a medical exam. The medical exam is designed to determine whether a person is physically and mentally fit to safely operate an aircraft. The medical exam requirement is not necessary for people

pursuing a rating in a glider or people with driver's licenses that are pursuing a rating for light sport aircraft. The FAA once allowed pilots to become certified to fly hot air balloons without a medical certificate but changed its position after the deadliest hot air balloon incident in history occurred in 2016 (Sumwalt et al., 2017). Hot air balloon pilots are now required to get at least a second-class medical certificate. This incident involved a pilot with an ADHD diagnosis that was taking prescribed medication and will be discussed in the following section of this paper.

The FAA has requirements for people with ADHD. The FAA prohibits the use of ADHD medication. First, a person must not have taken any ADHD medication for at least 90 days prior to the initial medical exam. The FAA may require individuals with ADHD to get a second examination with an FAA designated neuropsychologist, who must specifically be trained in aeromedical neuropsychology, after acquiring all necessary documentation from their initial medical examiner (FAA, 2018). Recent changes in the FAA's evaluation of individuals with ADHD no longer require a full neuropsychological testing battery if the manifestations of ADHD are not severe (Hattrup, 2020).

The FAA Neuropsychologist interviewing someone with ADHD will conduct an initial testing and, if necessary, a secondary testing battery. The initial testing battery will compose of a comprehensive background review and a review of collateral information from references, such as school counselors, employers, parents, and flight instructors. The neuropsychologist will then administer several psychological tests. Finally, the neuropsychologist will collect or arrange for the collection of a drug testing sample that detects ADHD medications and psychostimulants. If the neuropsychologist has no additional concerns, then additional testing is not necessary. If additional concerns remain, then additional tests will be conducted in the secondary testing battery (FAA, 2020).

Retired medical examiner Warren Silberman (2015) provides the following elaboration on the extensive tests done by the FAA:

> The complement of tests provides an objective way for the clinical psychologist to test for ADHD and any other underlying pathology that affects one's memory, ability to multitask, understand instructions, and many other executive tasks. The psychologist can compare one's scores to "normal" functioning individuals. Many young folks are placed on these medications without being tested. They are given them based solely on a history. In many cases they do not even have the condition, which is one reason why the FAA requires the testing.

FAA Neuropsychologists Chris Front and Randy Georgemiller (2022) in the FAA's Office of Aerospace Medicine summarize how and if the FAA issues medical certificates to individuals with ADHD as the following:

> Upon review, the FAA will either deny the pilot's application or grant an unrestricted or Special Issuance (SI) medical certificate. If the pilot receives a time-limited SI, further monitoring and assessment may be required. While time-consuming and costly, based on the safety risks posed by the symptoms of ADHD, the FAA has established this evidence-based risk assessment protocol to safeguard both the pilot and the national airspace system.

ADHD Pilots and Safety Issues

There is a correlation between vehicle operator ADHD and accidents documented in multiple studies. Adolescents with ADHD often get their driver's license at a later age than adolescents without ADHD and are more likely to get into a car crash sooner than adolescents without ADHD (Curry et al., 2017). The FAA's focus on ADHD deals with both the condition itself, as well as the medication. The central questions are:

1. Does the applicant take ADHD medication?
2. Can applicant function on a neurocognitive level that is safe for aeronautical decision making without ADHD medication?

It should be noted that while the FAA will disqualify a student pilot for taking ADHD medication, a study of 2,319,450 people revealed that individuals with ADHD were less likely to be in a car crash if they were taking medication (Chang et al., 2017).

Tanja Laukkala et al. (2017) reviewed the NTSB database for incidents involving ADHD and aviation accidents and found that only 4 fatal accidents out of 4894 accidents (0.08%) involved pilots with ADHD, and only 5 nonfatal accidents (0.1%), totaling only 9 out of 4894 accidents (0.18%). How many pilots are currently flying with undiagnosed ADHD? Thomas et. al. (2015) estimate that about 7.5 percent of adults worldwide have ADHD. There was a total of 756,928 certificated pilots in the United States in 2022 (FAA, 2023). If we use the estimate of Thomas et al. al (2015), then there are approximately 56770 pilots with ADHD. This falls greatly short of evidence needed to cause alarm over the dangers of allowing pilots with ADHD to operate aircraft, but there have been some incidents where manifestations of ADHD could clearly be seen as a role in an accident.

The 2016 hot air balloon crash in Lockhart, Texas was the most fatal hot air balloon crash

in aviation history, with 16 people being killed (including the pilot) after the balloon crashed into a powerline and caught fire. The NTSB investigation found that the pilot was diagnosed with ADHD and depression and was prescribed numerous medications for both (Sumwalt et al., 2017). In addition, the pilot was also prescribed medications for diabetes and blood pressure. The majority (5 out of 6) of the medications found in the pilot's toxicology report were either on the FAA's "Do not Issue" or "Do not Fly" list and have been found to have side effects that can impair judgment. One of those medications was Methylphenidate (most known under the brand name Ritalin), which was prescribed for ADHD and is on the FAA's "Do Not Issue" list (Sumwalt et al., 2017).

Methylphenidate was not the only potentially judgment altering medication that the pilot was taking, and it is impossible to tell which of the medications made the biggest impact on the pilot's aeronautical decision making. Nevertheless, we cannot ignore the warnings that are given regarding not operating vehicles or heavy machinery while taking Methylphenidate until a person knows how their dosage affects them. We also cannot ignore the adage in the ADHD community, "pills do not teach skills." The pilot's criminal history is consistent with some people that struggle with ADHD and might indicate trouble with managing his symptoms that should have been resolved before getting into the cockpit of an aircraft.

Oppositional Defiant Disorder (ODD), a condition that causes angry and defiant behavior towards authority figures, is a common comorbidity of ADHD and can be seen in people with ADHD whose symptoms cause them to frequently get into trouble with the law. ADHD/ODD comorbidities can be seen in ADHD cases of people that get into frequent trouble with the law, and about 50 to 60 percent of children with ADHD (Phelan, 2017; Watson, 2022). The pilot of the 2016 Lockhart, Texas hot air balloon crash had frequent incidents with the law that dated

back to a possession of drugs in 1987 and continued getting into trouble , including a total of three DWIs. The pilot failed to disclose his criminal history on FAA documentation (Sumwalt et al., 2017).

Data recovered from electronic devices onboard (which included pictures and video from passengers and the tablet used by the pilot for navigation), in addition to interviews of the ground crew, revealed that the pilot relied solely on the visual appearance of the weather to make a decision to fly and did not take the time to do a thorough weather analysis that would have revealed that weather conditions were going to deteriorate within the time window of the flight. During flight, the pilot made numerous attempts to make an emergency landing when weather conditions started to deteriorate and did not do so. This was critically important, as there is no lateral controlling a hot air balloon and piloting a balloon depends on climbing and descending to altitudes where wind direction corresponds to a pilot's flight plan (Sumwalt et al., 2017).

Poor planning, impulsivity, and lack of follow through are symptoms of ADHD. ADHD is treatable through social skills training, psychotherapy, and executive function coaching. Executive function coaching has been shown to improve the executive functioning of ADHD adults (Kubik, 2009; Parker et al., 2011; Ahmann et al., 2018). Many people are unable to access executive function coaching because of the inability to afford it. But if K-12 institutions with adequate human resources for special needs students can identify aspiring aviators with ADHD, then they can be of invaluable assistance to utilizing their resources to assist students with developing the executive functions skills that are necessary for good aeronautical decision making.

Gender differences exist in both ADHD and in aviation accidents. While symptoms are generally the same in all gender expressions, women and girls with ADHD tend to be diagnosed

as predominantly inattentive subtypes, where men and boys are more likely to be predominantly hyperactive subtypes (Rucklidge, 2008; Ramtekkar et al., 2010; Slobodin & Davidovitch, 2019). Women are more likely to have internal manifestations of ADHD, such as eating disorders and anxiety, whereas men are more likely to have external manifestations of ADHD, such as alcoholism and risk-taking behaviors (Stibbe et al., 2020). In comparison, aviation accidents caused by pilot error vary in causality. Male pilots were more likely to have accidents due to poor judgment, whereas female pilots were more likely to have accidents due to mishandling the aircraft (Walton & Politano, 2016). Male pilots with lower flight time are less likely to have an accident than female pilots with lower flight time, whereas experienced female pilots are less likely to have an accident than experienced male pilots (Walton & Politano, 2016; Burgess et al., 2018). Could the prevalence of ADHD among pilots account for some of the gender differences in air accidents caused by pilot error?

Executive Function and Aeronautical Decision-Making

Lara Honos-Webb (2018) defines executive function as "the cluster of advanced cognitive skills - including working memory, organization, and emotional control - that acts as your 'command center' as you navigate all of the complicated tasks of daily life" and identifies five core skills: Focus and Attention, Planning and Organization, Cognitive Flexibility, Emotional Regulation, and Impulse Control. The FAA's Aeronautical Decision-Making training syllabus identifies five hazardous attitudes: Anti-Authority, Impulsivity, Invulnerability, Macho, Resignation (FAA, 2022a). Each of the FAA's Five Hazardous Attitudes happens to be exacerbated by ADHD executive function deficits and examining the connections between each of the hazardous attitudes, and the associated executive function, can provide insight on how executive function coaching could be done from an aeromedical psychology perspective (see

Table 1).

Table 1

Comparison of Core Skills & Hazardous Attitudes

Honos-Webb's Five Core Skills of Executive Function (2018)	**The FAA's Five Hazardous Attitudes (2022)**
Impulse Control: The ability to override a stimulus to take an immediate action when there are more important things at hand, respecting rules, and boundaries, and practicing mindfulness.	**Impulsivity:** The sudden urge to do something right away without taking the time to think about it.
Focus & Attention: The ability to follow instructions, remember what is about to be done, and see a task through to completion.	**Anti-Authority:** The disregard for rules, regulations, and instructions from authority figures (i.e. Air Traffic Control, FAA Administrators, Flight Instructors, etc.)
Emotional Regulation: The ability to put feelings into context and to keep the intensity of feelings in check.	**Macho:** The overestimation of your level of knowledge and abilities and the constant feeling of needing to prove yourself to others.
Planning & Organization: The ability to operate in time and space in an orderly manner.	**Invulnerability:** The feeling that nothing bad will happen.
Cognitive Flexibility: The ability to transition from one task to the next.	**Resignation:** The tendency to think that a situation is hopeless and to stop attempting to take corrective action.

Cognitive Flexibility is "moving between different tasks simultaneously, applying concepts from one context toward solving a problem in another unrelated or new situation. It's also about evaluating strategies and generating novel solutions" (Verdolin, 2019). It is highly necessary in flying, as there are multiple events that occur between the start and the finish of a flight. For example, cognitive flexibility allows a hang glider pilot that flew two previous aerotow flights with smooth winds to suddenly adjust to unexpected turbulence on takeoff during the third aerotow. Micrometeorological conditions can adjust quickly and require adaptations and sometimes entire changes in a flight plan. Communicating and receiving instructions from Air

Traffic Control in regulated airspace can add to the many different adjustments that a pilot needs to make.

Pilots have to multi-task, and learning to multi-task properly and efficiently is both one of the struggles of being a pilot and struggles of operating in everyday life with ADHD. In flying, the phrase "task saturation" refers to when a pilot has too many things to do to operate efficiently and thus loses situational awareness.

> Like, when while flying IFR, you get an unexpected flurry of directions from a busy controller, or, when motoring along under VFR conditions, you encounter a cloud deck exactly where you don't want it to be while trying to get the information for landing at some strip you're having a hard time finding… Maybe instead of clarifying that last strange instruction, the controller keeps them coming, two or three simultaneously while you were in the middle of straightening out that strange thing the autopilot just did… And then the unthinkable happens. As you struggle under the deluge of too much to process with even more on its way as the controller's voice crackles into your headset with yet another admonishment, your brain does what brains do under such circumstances. It does what brains do no matter how smart you are, no matter how clever, how experienced or how diligent. Your brain starts shutting down. Locking up. You stop thinking. You just sit there, gazing forward blankly (Goyer, 2017).

Studies show that people with ADHD drive better and are more attentive when they are driving a car that has a manual transmission instead of an automatic transmission (Barkley, 2020). In addition, multitaskers with ADHD have been shown to have better moods and motivation when

the tasks are done in a non-interleaving manner (Gawrilow et al., 2011). These studies might imply that the ability of ADHD pilots to multitask would vary from one aircraft to another and that some aircraft may be more ADHD-friendly than others. Autopilot features have been shown to cause the minds of pilots to wander (Gouraud et al., 2017) in addition to causing their skills to deteriorate due to lack of practice (Federal Aviation Administration, 2013). The ADHD pilot should use autopilot with caution and rely on stick-and-rudder skills, being that ADHD can increase the risks of forgetting skills and losing situational awareness.

Some career pilot roles are possibly more ADHD friendly than others. Retired US Army aviator Nathaniel Swain (whose personal experience with ADHD is mentioned later) believes that international flights, spying and reconnaissance flights, and long cargo flights are the least ADHD-friendly ADHD pilot professions, whereas the ADHD pilot would thrive in pilot roles involving short domestic flights, agricultural, news and traffic, police, and medevac flying (Booker & Swann, 2023). This should be further investigated through additional scientific testing, as it could guide aviation businesses and the military with making accommodations for ADHD diagnosed pilots.

Risk management in all forms, including while flying, is made more difficult when a person is prone to risk-taking behavior. For many people with ADHD, risk-taking behavior can be the result of bravado. People with ADHD can feel ostracized as children when their peers as youth and can be attracted to social groups that appear to be “cool” and “in control,” and begin displaying engaging in risk taking behaviors to fit in with said groups. Many of these emotionally vulnerable ADHD adolescents continue to have this attitude into adulthood (Kelly & Ramundo, 2006). This behavior matches that “Macho” attitude in the FAA’s five hazardous attitudes, where pilots make risky decisions because of a constant need to prove themselves to

others (FAA, 2020).

Perfectionism is both a trait of ADHD and an issue with pilots. Perfectionism is often a coping mechanism of people with ADHD, who strive to be great at everything to compensate for their feelings of inadequacy in addition to being chronic overthinkers with difficulty managing anxiety, often to the point of burning themselves out (Kelly & Ramundo, 2006; Hallowell & Ratey, 2017; Saline, 2018). Certified Flight Instructor Julie Halen (2021) tells the following story about a student pilot with perfectionism issues:

> There is one student in particular I remember having to fail because he was one of the first I failed... and it ate at me because I knew he could have passed. The ground portion went well, but when we got into the air things started going downhill. He messed up on a simple maneuver and couldn't move on mentally. I told him it was fine and that he could make a few mistakes, as long as he stayed safe and performed the rest of the maneuvers well, he would pass just fine. However, he kept beating himself up about that one little mistake.
>
> Because his mind was still on the last maneuver, he screwed up on the next one, and the next one, and before we were even halfway through the maneuvers, he was mentally gone from the test. He'd already told himself he couldn't do it, that he had failed, that he had met with me before he was ready, etc. I wanted to pass him so badly, but I hadn't seen satisfactory performance and didn't feel safe letting him move on to the next phase of training without flying with him again.

Perfectionist pilots can increase the risk of a flight by staying fixated on previous errors and

mishaps at the expense of situational awareness, leading to more anomalies during flight.

Self-Regulation issues in people with ADHD can stem from lacking the self-awareness (metacognition) necessary to hold themselves accountable for their actions, which stems from a lack of mindfulness. Hazardous attitudes of anti-authority, impulsivity and invulnerability can coincide with the absence of self-awareness in the ADHD pilot. The FAA encourages pilots to use the IMSAFE checklist, where IMSAFE is a mnemonic for Illness, Stress, Medication, Alcohol, Fatigue, and Emotion (FAA, 2022a). Fatigue is exacerbated by ADHD (Ramsay, 2021), and people with ADHD are at a greater risk of binge drinking (Howard et al., 2015).

Hyperfocus is the tendency of people with ADHD to devote extreme focus to things. ADHD isn't just about the absence of focus. It can also lead to much higher-than-normal levels of focus, which can lead to much higher levels of productivity (Ashinoff & Abu-Akel, 2021). Retired US Army Rotary Wing Aviator Major Nathaniel Swann had this to say about his experience as a military pilot with ADHD:

> I believe my ADHD, even if I didn't know it at the time, probably helped me perform at my best when flying or directing the units and teams I oversaw. I could hyperfocus when necessity required it in high-stress environments, and I was able to jump from one thing to the next — fast. Fellow combat-tested soldiers have told me they had never seen someone respond to events as quickly as I did and get it right each time.
>
> Everyone freezes to some degree in moments of extreme stress, as they analyze and weigh "fight or flight." Maybe it's the way I'm wired, but I've found that my freeze response is more stunted than most everyone else's. A stressor, I also learned, can trigger intense concentration and

quiet everything else around me (Swann, 2021).

Hyperfocus has been the subject of many ADHD specialists that discuss harnessing hyperfocus as a positive of ADHD to help individuals with ADHD increase flow and productivity. A study of fourteen entrepreneurs showed that both their impulsivity and hyperfocus have been drivers of both positive and negative changes (Wiklund et al., 2016). The key to making ADHD hyperfocus an advantage lies in the person with ADHD learning to prioritize tasks (Saline, 2022).

Impulsivity can also be turned into an advantage. Functional Impulsivity is the ability to act on impulse with positive consequences. Catalina E. Kopetz et al. argue that impulsivity is subjective, strategic and varies from one thing to another; therefore, identifying and addressing the need that a person is attempting to fulfill may be more productive than pathologizing a person's impulsive behavior (2018). Dopamine, which is the brain chemical that is associated with the pleasure that is felt from impulsive actions, is also involved in a different brain circuit that allows an organism to immediately stop what it is doing and focus on a sudden danger at hand (Menegas et al., 2018).

Dysfunctional Impulsivity, which is acting on impulse with negative consequences, can be unlearned by overriding the reward associated with the dysfunctional impulsive behavior with instead focusing on the rewards associated with a larger goal at hand and developing emotional intelligence (Jimura et al., 2013; Merchán-Clavellino et al., 2019; Peyton et al., 2019). Professional Counselor Raychelle Lohman (2015) recommends the following 5 strategies for balancing out eliminating dysfunctional impulsivity and allowing functional impulsivity: 1) Increasing self-awareness, 2) Taking a "self-imposed time out," 3) Finding an accountability partner, 4) Putting alternative strategies into place, 5) Practicing mindfulness to relax.

How IEPs and 504 Plans Can Assist with Mitigating Executive Function Issues for Flight Training and Aeronautical Decision-Making

Executive Function Coaching can lead a young person with ADHD to develop into an adult s able to successfully manage their ADHD-symptoms. School counselors are not meant to provide long-term mental health benefits for students. Instead, the school counselor's role is to advise students about their academic, professional/vocational, and social/emotional needs (American School Counselor Association, 2020). However, a school counselor can be invaluable in helping young aspiring pilots with ADHD to put together a plan to get from their current state of being to a professional pilot that is able to manage their ADHD well enough to safely operate an aircraft.

The school counselor should first begin with a frank conversation about what it will take to become a professional pilot and the realities of how the student's condition will make the process more challenging (M. Archer, personal communication, December 29, 2022). The counselor can even explain how other aerospace professionals have limiting requirements, such as flight attendants having to meet the physical requirements of being able to walk through a door, move throughout the cabin, and reach the overhead bins (M. Archer, personal communication, December 29, 2022; Klein, 2022). ADHD is not necessarily a dealbreaker, but every case of ADHD is different, and not every person with ADHD will be able to manage their symptoms.

The School Counselor helps the school provide additional services to a student as provided by their IEP or 504 Plan. These may include one-on-one meetings to assist a student with organization, task portioning, usage of a planner, color coding items, and other strategies to help the student with ADHD (G. Hawkins, personal communication, December 30, 2022).

The IEP is written by a team. The Individuals with Disabilities Education Act (IDEA, 1990) says that the following individuals must be present on an IEP team:

1. Parents of the child
2. At least one general education teacher
3. At least one special education teacher
4. A person that can interpret the results of an evaluation
5. A representative of the school/district that is knowledgeable of the resources that are available to the student, knowledgeable of the curriculum, and is qualified to provide and/or supervise the supervision and provisions of instruction for special needs students.

Optionally, the IEP team can contain advocates and subject matter experts to provide perspective (2004). If the child is seriously committed to becoming a pilot, then a CFI should be invited to be on the IEP team, as most special education professionals know little to nothing about FAA regulations and operating an aircraft (M. Archer, personal communication, December 29, 2022; G. Hawkins, personal communication, December 30, 2022). The CFI's presence can help to prevent accommodations that are counterproductive in the long run. Furthermore, inviting an FAA aeromedical psychologist can help assist with the IEP psychologist (who might not have aeromedical psychology training) interpreting the results of testing from the FAA's point of view.

The Rehabilitation Act of 1973 prohibits discrimination against individuals based upon disability. Section 504 of the Rehabilitation Act of 1973 explicitly forbids exclusion of individuals from services because of a disability and requires equal access to all opportunities. Like IDEA (1990), Section 504 of the Rehabilitation Act (1973) calls for elementary and secondary schools to assemble a team of experts to write the 504 Plan. Unlike IDEA, the rules

for who must be on the Section 504 team are not as specific. Nevertheless, the aforementioned suggestions of bringing in CFI's and FAA qualified aeromedical psychologists for IEP teams also apply to 504 Plan teams.

An IEP becomes irrelevant after a student leaves high school and does not provide protection anywhere else. However, section 504 applies to universities and workplaces, so a professional pilot can have the pilot's union advocate for accommodations on the pilot's behalf. If portioned workloads were a provision of a 504 plan, then the pilot with ADHD could consider mirroring this accommodation by having their employer schedule them for short flights and avoid placing them on longer flights over 3 hours (G. Hawkins, personal communication, December 30, 2022). This is especially easier to do when K-12 504 Teams familiarize themself with the different types of professional pilots that exist and do not solely focus on the airline pilot profession. There are many ways to be a career pilot, and all of them have different requirements. Some of those career paths requirements are more ADHD-friendly than others.

Functional Goals are IEP/504 Goals that are not necessarily academic, but they allow for a student to be more functional in an academic setting; and they are developed by functional skills, which are the practical skills that are related to the outlined functional goal (Herr & Bateman, 2012). IEP goals vary greatly from one student to another, depending on the student's disability. For the aspiring pilot with ADHD, functional goals should help to develop skills that will translate from the classroom to the cockpit.

The first functional goal that will need to be clear to the student is the importance of being coachable and accepting criticism without taking it personally. Developing self-awareness to self-correct and listen to feedback will be critical for an ADHD pilot, as vehicle operators with ADHD can sometimes be heedless to the dangers of their vehicle operation habits. ADHD

specialist Russell Barkley (2021), whose work has been cited earlier in previous sections, had a brother with ADHD that was killed in a car crash that he partially attributes to his brother's failure to manage his ADHD symptoms while driving and said the following:

> My brother, Ron, had ADHD in his early childhood, and it continued all his life — which ended abruptly, six years ago, when he was 56, in a single-car accident in Keene, New York. That accident can be attributed to his ADHD and its impact on his driving habits — speeding, risk-taking, distractibility, use of alcohol, and disdain for the seat belt.…ADHD symptoms always stood in the way of [Ron] taking my advice. Research suggests that adults with ADHD do not judge themselves as being different in their driving performance than adults without attention deficit disorder, despite their history to the contrary. And those with ADHD are less likely to use information and skills for self-improvement than someone without the disorder.
>
> Ron knew what a seat belt is for. He got tickets for not wearing one. Yet his failure to use a seat belt led to his death. So I ask: Why don't people with ADHD do what they know to be good for them?

Rejection Sensitive Dysphoria, a term used to describe hypersensitivity to criticism, accompanies many people with ADHD; and RSD is treated with emotional regulation coaching and stress management (Bedrossian, 2021). The majority of CFI's do not have knowledge of pedagogy and/or ADHD and may not necessarily know how to give important feedback with tact. In fact, many CFIs are not particularly interested in really understanding pedagogy and are only teaching because they are trying to build their required hours to become airline pilots (Thompson, 2017).

It will be important for the ADHD student pilot to:

1. Be open to objective and constructive criticism
2. Not take objective and constructive criticism as a personal attack

Therefore, listening to feedback will need to be a stated goal for the ADHD student. Their life could depend on it.

Learning to differentiate between constructive and destructive criticism is the first skill. Students should be taught about the different types of feedback, which include task feedback, process feedback, self-regulation feedback, and feedback about the person. Teachers should avoid feedback about the person because it is ineffective (Frey et al., 2019). Furthermore, the other types of feedback should contain both things that the student did correctly as well as areas of improvement to be received by the student (Buckingham & Goodall, 2019; Frey et al., 2019). In addition, the student should participate in lessons where this type of feedback is practiced. The student should also be given examples of both constructive and destructive criticism and taught to differentiate between the two. During check-ins, the student should be asked about moments throughout the week about how feedback was given to them, how they felt about it, and what they did about it.

Good IEP and 504 Plans are contextually mediated, measurable, observable, repeatable, and take into account both the end objectives and the current states of the child's being before being written and are not made from templates where the child's name is just swapped (Petersen, 2018). A student with ADHD that is aspiring to be a pilot can have target outcomes that take into account what would be expected of them as a pilot as the end goal, while constructing objectives that consider their current state as a starting point to work towards those goals. As mentioned earlier, all five of the FAA's five hazardous attitudes are symptoms of ADHD. The FAA's five

hazardous attitudes can be used as a reference point. The anecdotes to these five hazardous attitudes can all be functional goals in which functional skills can be developed (G. Hawkins, personal communication, December 30, 2022). This could be done as with the following examples in Table 2 (which is by no means an exhaustive list).

Table 2

Examples of Functional Goals for the FAA's Five Hazardous Attitudes

FAA's Five Hazardous Attitudes & Their Anecdote	**Associated IEP/504 Plan Functional Goals and Skills**
Anti-Authority - Person is not interested in following instructions and behaves as if the rules only apply to everyone else Anecdote - Remember that the rules exist for your safety (FAA, 2022)	This functional goal and its accompanying functional skills would apply to students that need support with following rules and authority figures. Target Outcome: A pilot that follows FAA regulations, when applicable, instructions from authority figures such as ATC. Functional Goal: The student will be able to adhere to rules and regulations ● Functional Skill: Student will be able to respond to attention commands ● Functional Skill: Student will be able to repeat back instructions after receiving them
Impulsivity - The tendency to act on urges immediately without any forethought. Anecdote - Slow down and take a moment to think things through (FAA, 2022a)	The following target outcomes, functional goals, and functional skills are intended for students with impulse control issues. Target Outcome: A pilot that exhibits checklist discipline and utilizes decision loops to make choices. Functional Goal: The student will be able to exhibit follow a checklist ● Functional Skill: The student will be able to utilize a checklist to complete a task from start to finish without

	skipping items. Functional Goal: The student will delay gratification by setting short term, medium term, and long-term goals ● Functional Skill: The student will be able to identify a 1-hour reward that allows them to remain on task and identify distracting behaviors to abstain from until the 1-hour mark has passed. ● Functional Skill: The student will be able to identify a 1-week reward that allows them to remain on task and identify distracting behaviors to abstain from until the 1-week mark has passed. ● Functional Skill: The student will be able to identify a 1-month reward that allows them to remain on task and identify distracting behaviors to abstain from until the 1-month mark has passed. Functional Goal: The student will be able to delay instant gratification ● Functional Skill: The student will be able to describe their actions using the OODA loop ○ Functional Sub-Skill: The student will be able to describe what he/she/they observed before taking a course of action. ○ Functional Sub-Skill: The student will be able to describe the meaning and significance ("Was this really important?") of what he/she/they deserved before taking a course of action. ○ Functional Sub-Skill: The student will be able to describe how their action was a response to their observations and analysis of their observations. ○ Functional Sub-Skill: The student will be able to play and increase skill in games that increase decision loop thinking and decrease impulsivity, such as chess and sudoku.
Invulnerability - The belief that	The following target outcomes, functional goals, and functional

nothing can or will happen to you. Anecdote - It can happen to you	skills are intended for students with invulnerability issues. Target Outcome: To produce a pilot that understands that dangerous things can happen and are best prevented with safe behavior Functional Goal: The student will be able to make informed choices based on awareness of potential danger ● Functional Skill: Student will be able to identify a reward for safe behavior ● Functional Skill: The student will be able to identify and describe potential hazards for an activity in personal terms that relate to him/her/them and identify ways to prevent identified hazards from happening. ● Functional Skill: The student will be able to create personalized plans for safe behavior and execute such plans.
Macho - The constant urge to prove oneself capable and not being aware and/or respecting one's own limitations. Anecdote - Taking unnecessary chances doesn't accomplish anything. (FAA, 2022a)	The following target outcomes, functional goals, and functional skills are intended for students with macho issues. Target Outcome: To produce a pilot that balances humility with confidence and knows his/her/their limitations. Functional Objective: The student will be able to regulate feelings of inadequacy ● Functional Skill: The student will be able to set reasonable expectations for himself/herself/themselves. ● Functional Skill: The student will be able to articulate why both positive and negative emotions must be regulated ● Functional Skill: The student will be able to identify unnecessary risks that he/she/took to impress friends/peers after reflecting upon previous choices.
Resignation - The tendency to give up and accept fate before all options for corrective action have been exhausted. Anecdote - Keep trying to solve the problem until something works.	The following target outcomes, functional goals, and functional skills are intended for students with learned helplessness issues. Target Outcome: To produce a resilient pilot that will not cease to stop looking for ways to solve unexpected problems as they arise.

(FAA, 2022a)	Functional Goal: The student will be able to continue solving difficult problems without giving up after failed efforts. ● Functional Skill: The student will be able to differentiate between a growth mindset and a fixed mindset. ● Functional Skill: The student will be able to identify statements that reflect a growth mindset vs. statements that reflect a fixed mindset. ● Functional Skill: The student will be able to revisit situations where the student did not continue to attempt to solve a problem and reflect upon why, and what could have been done to solve the problem.

Checklist discipline is a term used in Aviation to refer to the professional's ability to move through every item on a checklist in sequential order and not neglect any of the steps. United States Air Force Colonel Gary Goldstone (2010) says, "Having the discipline to follow procedures—even when we know them by heart—is at the heart of working toward sustainable processes that will not only serve us during the inspection, but also in our day-to-day mission". He goes on to say "Checklist discipline covers many aspects of our daily mission. Whether it's pre-flighting an aircraft, preparing for an event, or running a recall, using a checklist not only makes [sure] all the steps are completed but can also rapidly identify when something isn't right so that actions can be taken to resolve the problem" (Goldstone, 2010). Including this as a target outcome in an IEP connects the checklists as a tool that are used by counselors with ADHD to the checklists they will be expected to use as aviators. The school counselor assisting the student can modify many of the checklists already used in aviation (such as IMSAFE) with the intent of making these checklists familiar to the student.

High school programs with staff that have access to technology teachers that are familiar with 14 CFR Part 107 and themselves are Remote Pilot Certified may (and perhaps should) work in conjunction with career and business education teachers at the school to use the FAA's

Remote Pilot Certification as a form of scaffolding the student into the FAA's other licenses (Small Unmanned Aircraft Systems, 2016). A student must be at least 16 years old to be certified by the FAA as a commercial sUAS operator but may take the exam at age 14 (FAA, 2022b). Acquiring the remote pilot certification and then working as a professional drone pilot in their spare time while maintaining good grades can demonstrate that the student is able to manage their ADHD-symptoms enough to fly professionally and maintain the other aspects of their life.

Pursuing the remote pilot certification should be a planned and documented act in which the IEP or Section 504 team and the child's pediatrician/psychiatrist should participate. Although no medical exam is required to be a remote pilot, FAA airmen are still prohibited by 14 C.F.R. Part 61 from taking all medications on the FAA's Do Not Issue (DNI) or Do Not Fly (DNF) lists (Certification: Pilots, Flight Instructors, and Ground Instructors, 1997). Since this includes *all* ADHD medication, students will need to coordinate a controlled and supervised stoppage of ADHD medication usage. The before and aftereffects of discontinuation of ADHD medication usage should be documented at the next IEP or 504 Plan team meeting.

High School students can also pursue private pilot licenses, along with single engine and multi-engine ratings while in high school. Some high schools with aviation magnet programs allow for this. In addition to assisting with controlled ADHD medication discontinuation, the IEP and 504 teams now have data from the student's first FAA Medical exams to use as needed. A successful passing of the FAA Medical Psychological Exams and issuance of an FAA medical certificate (which would occur in 10th grade at the soonest) might be an indicator that it is time to terminate IEP services.

Conclusion

Becoming a professional pilot with ADHD is not impossible, but there are a series of

restrictions that the FAA has placed upon individuals with ADHD that choose to pursue licenses to fly single and multi-engine airplanes, helicopters, balloons, and airships. These restrictions center around acquiring a medical certificate, which is required for all airmen to fly solo. Acquiring these certificates requires applicants to

1. Not take ADHD medication
2. Be able to pass the FAA's tests of executive function administered by an FAA registered aeromedical psychologist

The first examination takes many things from the applicant's background into account, including the student's IEP or 504 plan.

K-12 institutions with students that are aspiring career pilots can utilize their resources to help the student prepare for managing their ADHD symptoms inside of the cockpit of an airplane. IEP and Section 504 teams that collaborate with CFI's and aeromedical psychologists can provide pilot-specific services, functional goals, functional skills, and accommodations that can help to have the student ready to become certificated pilots after graduation. Recipients of Section 504 plans, which are also applicable to workplaces, may also be able to use such 504 plans to advocate for workplace accommodations in conjunction with pilot unions.

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