Aviation Instructor's Handbook (FAA-H-8083-9)

Chapter 2: Human Behavior

Introduction

Derek's learner, Jason, is very smart and able to retain a lot of information, but has a tendency to rush through the less exciting material and shows interest and attentiveness only when performing tasks that he finds to be interesting. This concerns Derek because he is worried that Jason will overlook many important details and rush through procedures. For a homework assignment Jason was told to take a very thorough look at Preflight Procedures and that for his next flight lesson they would discuss each step in detail. As Derek predicted, Jason found this assignment to be boring and was not prepared. Derek knows that Jason is a "thrill seeker" as he talks about his business, which is a wilderness adventure company. Derek wants to find a way to keep Jason focused and help him find excitement in all areas of learning so that he will understand the complex art of flying and aircraft safety.

Learning is the acquisition of knowledge or understanding of a subject or skill through education, experience, practice, or study. This chapter discusses behavior and how it affects the learning process. An instructor seeks to understand why people act the way they do and how people learn. An effective instructor uses knowledge of human behavior, basic human needs, the defense mechanisms humans use that prevent learning, and how adults learn in order to organize and conduct productive learning activities.

Definitions of Human Behavior

The study of human behavior is an attempt to explain how and why humans function the way they do. A complex topic, human behavior is a product both of innate human nature and of individual experience and environment. Definitions of human behavior abound, depending on the field of study. In the scientific world, human behavior is seen as the product of factors that cause people to act in predictable ways.

For example, speaking in public is very high on the list of fears many people have. While no two people react the same to any given fear, fear itself does trigger certain innate responses such as an increase in breathing rate. How a person handles that fear is a product of individual experiences. The person who has never spoken in public may be unable to fulfill the obligation. Another person, knowing his or her job requires public speaking, may choose to take a class on public speaking to learn how to cope with the fear.

Human behavior is also defined as the result of attempts to satisfy certain needs. These needs may be simple to understand and easy to identify, such as the need for food and water. They also may be complex, such as the need for respect and acceptance. A working knowledge of human behavior can help an instructor better understand a learner. It is also helpful to remember that to a large extent thoughts, feelings, and behavior are shared by all men or women, despite seemingly large cultural differences. For example, fear causes humans to either fight or flee. In the public speaking example above, one person may "flee" by not fulfilling the obligation. The other person may "fight" by learning techniques to deal with fear.

Another definition of human behavior focuses on the typical life course of humans. This approach emphasizes human development or the successive phases of growth in which human behavior is characterized by a distinct set of physical, physiological, and behavioral features. The thoughts, feelings, and behavior of an infant differ radically from those of a teen. Research shows that as an individual matures, his or her mode of action moves from dependency to self-direction. Therefore, the age of the learner impacts how the instructor designs the curriculum. Since the average age of a learner can vary, the instructor needs to offer a curriculum that addresses the varying learner tendency to self-direct. *[Figure 2-1]*

By observing human behavior, an instructor can gain the knowledge needed to better understand him or herself as an instructor as well as the learning needs of learners. Understanding human behavior leads to successful instruction.

Instructor and Learner Relationship

How does personality type testing affect instructors and learners? Research has led many educational psychologists to feel that based on personality type, everyone also has an individual style of learning. In this theory, working with that style, rather than against it, benefits both instructor and learner. Although controversy often swirls around the educational benefits of teaching learners according to personality types, it has gained a large following and been implemented at many levels of education. Today's learner can visit any number of websites, take a personality test, and discover what type of learner he or she is and how best to study.

In a continuing quest to figure out why humans do what they do, the mother-daughter team of Katharine Cook Briggs and Isabel Briggs Myers pioneered the Myers-Briggs Type Indicator (MBTI) test in 1962. The MBTI was based on Jungian theory, previous research into personality traits, and lengthy personal observations of human behavior by Myers and Briggs. They believed that much seemingly random variation in human behavior is actually quite orderly and consistent, being due to basic differences in the ways individuals prefer to use their perception and judgment.

They distilled human behavior into sixteen distinct personality types. Inspired by their research, clinical psychologist and author, Dr. David Keirsey condensed their sixteen types into four groups he calls Guardian, Artisan, Rational, and Idealist. Others have either contributed or continued to expand personality research and its influence on human behavior. Personality type testing now runs the gamut from helping people make career choices to helping people choose marriage partners.

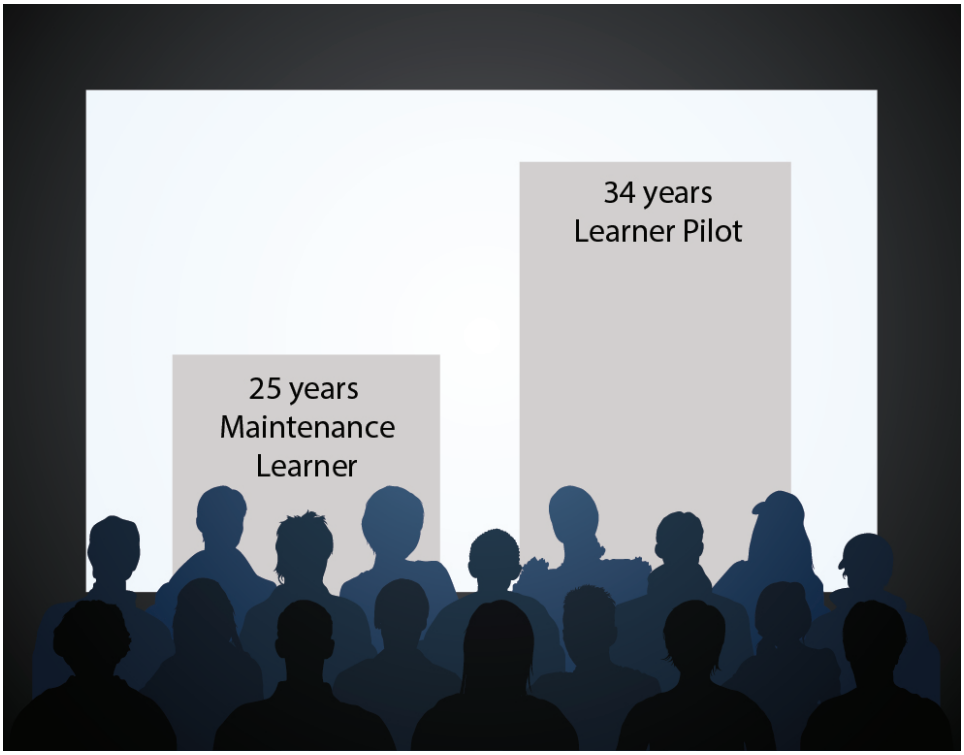

Figure 2-1. *The average age of a learner pilot is 34, while the average age of a maintenance learner is 25.*

Not only does personality type influence how one learns, it also influences how one teaches. Learning one's personality type helps an instructor recognize how he or she instructs. Why is it important to recognize personal instruction style? The match or mismatch between the way an instructor teaches and the way an individual learns contributes to instructional satisfaction or dissatisfaction. Learners whose styles are compatible with the teaching styles of an instructor tend to retain information longer, apply it more effectively, learn more, and have a more positive attitude toward the course in general. Although an instructor cannot change his or her preferred style of teaching to match a learning style, steps can be taken to actively bridge the differences.

Consider the Derek's dilemma with Jason described at the beginning of this chapter. Derek knows he is the type of instructor who provides a clear, precise syllabus and has a tendency to explain with step-by-step procedures. His teaching style relies on traditional techniques and he often finds himself teaching as he was taught. Observation leads Derek to believe Jason is the type of person who needs the action, excitement, and variation reflected in his career choice. In an effort to focus Jason on the need to learn all aspects of flight, Derek sets up a scenario for the day that features how to scout locations for future adventure tours.

By adjusting the flight scenario, Derek pushes himself out of his lock-step approach to teaching. He has also added an element of variation to the lesson that not only interests Jason, but is one of the reasons he wants to learn to fly.

Motivation

Motivation is the reason one acts or behaves in a certain way and lies at the heart of goals. A goal is the object of a person's effort. Motivation prompts learners to engage in hard work and affects learner success. Being smart or coordinated seldom guarantees success, but motivation routinely propels learners to the top. An important part of an aviation instructor's job is to discover what motivates each learner and to use this information to encourage him or her to work hard.

Motivation is probably the dominant force that governs the learner's progress and ability to understand and can be used to the advantage of the instructor. Motivation comes in many guises. It may be negative or positive. Negative motivation may engender fear, for example. While negative motivation may be useful in certain situations, characteristically it is not as effective in promoting efficient learning as positive motivation. *[Figure 2-2]* Positive motivation is provided by the promise or achievement of rewards. These rewards may be personal or social, they may involve financial gain, satisfaction of the self-concept, personal gain, or public recognition.

Figure 2-2. *Insecure and unpleasant training situations inhibit learning.*

Motivation may be tangible or intangible. Learners seeking intangible rewards are motivated by the desires for personal comfort and security, group approval, and the achievement of a favorable self-image. The desire for personal comfort and security is a form of motivation which instructors often forget. All learners want secure, pleasant conditions and a safe environment. If they recognize that what they are learning may promote these objectives, their attention is easier to attract and hold. Insecure and unpleasant training situations inhibit learning. Learners also want a tangible return for their efforts. For motivation to be effective on this level, learners know that their efforts are suitably rewarded. These rewards need to be constantly apparent to the learner during instruction, whether they are to be financial, self-esteem, or public recognition.

The tangible rewards of aviation are not always obvious during training. Traditional syllabi often contain lessons with objectives that are not immediately obvious to the learner.

These lessons may pay dividends during later instruction, a fact the learner may not appreciate and may result in less knowledge transfer than if the learner could relate all objectives to an operational need (law of readiness). The instructor should ensure that the learner is aware of those applications not immediately apparent. To reduce this issue, the instructor should develop appropriate scenarios that contain the elements to be practiced.

Everyone wants to avoid pain and injury. Learners normally are eager to identify operations or procedures that help prevent injury or loss of life. This is especially true when the learner knows that the ability to make timely decisions, or to act correctly in an emergency, is based on sound principles.

The attractive features of the activity to be learned also can be a strong motivational factor. Learners are anxious to gain skills that may be used to their advantage. If they understand that each task is useful in preparing for future activities, they are more willing to pursue it.

Another strong motivating force is group approval. Every person wants the approval of peers and superiors. Interest can be stimulated and maintained by building on this natural desire. Most learners enjoy the feeling of belonging to a group and are interested in accomplishment, which gives them prestige among their peers.

Every person seeks to establish a favorable self-image. In certain instances, this self-image may be submerged in feelings of insecurity or despondency. Fortunately, most people engaged in a task believe that success is possible under the right combination of circumstances and good fortune. This belief can be a powerful motivating force for learners. An instructor can effectively foster this motivation by the introduction of perceptions that are solidly based on previously learned factual information easily recognized. Each additional block of learning should help formulate insight, contributing to the ultimate training goals and promoting confidence in the overall training program. At the same time, it helps the learner develop a favorable self-image. As this confirmation progresses and confidence increases, advancement is more rapid and motivation is strengthened.

Positive motivation is essential to true learning. Negative motivation should be avoided with all but the most overconfident and impulsive learners. Slumps in learning are often due to declining motivation. Motivation does not remain at a uniformly high level. It may be affected by outside influences, such as physical or mental disturbances or inadequate instruction.

The instructor should strive to maintain motivation at the highest possible level. In addition, the instructor should be alert to detect and counter any lapses in motivation.

Where Does the Motivation to Learn Come From?

Motivation to learn can come from many sources. Some learners have a fundamental interest in aviation and experience sheer fascination with aircraft or with the experience of flight. Other learners may decide that aviation provides an opportunity to develop a wide variety of technical, physical, communication, and problem-solving abilities. Some see aviation as a way to boost their self-image or ego. Other learners are motivated by tradition and wish to follow in the footsteps of a relative or close friend. Some learners are motivated to pursue aviation training because it offers a promising career. To others, aviation offers prestige or acceptance within social groups. Some may think that aviation offers fun and excitement or simply a more convenient form of transportation. All of these sources of motivation have one thing in common: they all offer some type of reward in exchange for performing the hard work.

Aviation instructors should keep in mind that adult learners who are motivated to seek out an educational experience do so primarily because they have a use for the knowledge or skill being sought. Learning is a means to an end, not an end in itself. Based on this, it is important instructors determine why a learner enrolled in the course. Based on preference and/or class size, an instructor can conduct a brief personal interview with the learner or have them complete an information form. Asking questions such as “Why are you taking this course?” or “How do you plan to use the information you learn in this course?” may be all that is necessary.

Learner Questionnaire

A short questionnaire can be helpful in gathering additional background information. For example, it is helpful to know a learner’s familiarity with the subject matter. Questions such as “Have you ever taken a course in aircraft maintenance?” or “Have you ever flown a small airplane?” or “Have you had any on-the-job training in avionics?” should garner the type of information needed.

A short questionnaire also offers an instructor the chance to discover how different learning styles may improve knowledge transfer (small groups, independent study, etc.). Another possible way to gather information about a learner is to have him or her write a brief autobiography which includes any experience with the subjects being taught. However an instructor gathers information about learners, the information helps the instructor allow for not only personal learning goals for the course, but also the goals and motivations of the learners, their background in aviation training, as well as their preferences. An instructor armed with this information can make the experience beneficial to all involved.

Maintaining Motivation

Motivation is generally not something that can be transferred from one person to another. Instructors should become skillful at recognizing problems with motivation and at encouraging learners to continue to do their best.

Rewarding Success

Positive feedback encourages learners. Practice positive feedback frequently by:

- Praising incremental successes during training.
- Relating daily accomplishments to lesson objectives.
- Commenting favorably on learner progress and level ability.

For example, as the learner progresses through training, remark on the milestones. When a learner first performs a task alone, congratulate him or her on having learned it.

When that same skill reaches an intermediate level, point out that the learner’s performance is almost consistent with the requirements of the Airman Certification Standards (ACS), the set of standards detailing the knowledge and skills an airman needs to possess and demonstrate to obtain a pilot certificate. When performance is equal to the ACS requirements, comment favorably on the skill acquisition. When learner performance exceeds ACS requirements, point out what a benefit this will be when the learner performs under pressure during a practical test or on the job.

Presenting New Challenges

With each declaration of success, be sure to present learners with the next challenge. For example, when a learner begins to perform a skill consistently to ACS or PTS requirements, challenge him or her to continue to improve it such that the skill can be performed under pressure or when distracted. Instructors can also add new problems or situations to create a learning scenario.

Drops in Motivation

Instructors should be prepared to deal with a number of circumstances in which motivation levels drop. It is natural for motivation to wane somewhat after the initial excitement of the learner's first days of training, or between major training events such as solo, evaluations, or practical tests. Drops in motivation appear in several different ways. Learners may come to lessons unprepared or give the general sense that aviation training is no longer a priority. During these times, it is often helpful to remind learners of their own stated goals for seeking aviation training.

Learning plateaus are a common source of frustration, discouragement, and decreased learner motivation. A first line of defense against this situation is to explain that learning seldom proceeds at a constant pace—no one climbs the ladder of success by exactly one rung per day. Learners should be encouraged to continue to work hard and be reassured that results will follow.

Summary of Instructor Actions

To ensure that learners continue to work hard, the instructor should:

1. Ask new learners about their aviation training goals.
2. Reward incremental successes in learning.
3. Present new challenges.
4. Occasionally remind learners about their own stated goals for aviation training.
5. Assure learners that learning plateaus are normal and that improvement will resume with continued effort.

Human Needs and Motivation

Human needs are things all humans require for normal growth and development. These needs have been studied by psychologists and categorized in a number of ways. Henry A. Murray, one of the founders of personality psychology who was active in developing a theory of motivation, identified a list of core psychological needs in 1938. He described these needs as being either primary (based on biological needs, such as the need for food) or secondary (generally psychological, such as the need for independence). Murray believed the interplay of these needs produce distinct personality types and are internal influences on behavior.

Murray's research underpins the work of psychologist Abraham Maslow who also studied human needs, motivation, and personality. While working with monkeys during his early years of research, he noticed that some needs take precedence over others. For example, thirst is relieved before hunger because the need for water is a stronger need than the need for food. In 1954, Maslow published what has become known as Maslow's Hierarchy of Needs. *[Figure 2-3]* According to Maslow, human needs go beyond the obvious physical needs of food and shelter to include psychological needs, safety and security, love and belongingness, self-esteem, and self-actualization to achieve one's goals. Human needs are satisfied in order of importance. Once a need is satisfied, humans work to satisfy the next level of need. Need satisfaction is an ongoing behavior that determines everyday actions.

Since Maslow's findings, multiple psychological studies have proven that humans can experience higher levels of motivation while not having lower basic needs met. In a study from 2011, researchers at the University of Illinois found that Maslow's hierarchy was not universal and the order in which these needs were met did not have much impact on the satisfaction or happiness of an individual. Maslow's theory has little to no empirical data to support his findings on the five-need hierarchy (Whaba and Bridgewell, 1976).

Maslow's hierarchy states that each level has to be meet 100 percent before moving on to the next level of need. However, a person can still achieve what they were "born to do" while still being hungry.

What was apparent in multiple studies, however, was that humans have needs that affect their ability to focus on the task at hand. Learners tend to show little to no motivation or attention if most of their needs are not met. If a learner is hungry (physiological), their focus of perceptions (attention) will not be on the instructor and the subject being presented. Rather, it will be on satisfying the physiological need as soon as possible. The same can be said about an anxious learner attempting a fully-developed stall for the first time. If the learner feels unsafe (safety and security), their focus of perception is on their "flee" response and not the skill that the learner it trying to acquire. However, what is important here is the focus of perceptions, and the ability of the instructor to concentrate the learner's senses on the subject being presented.

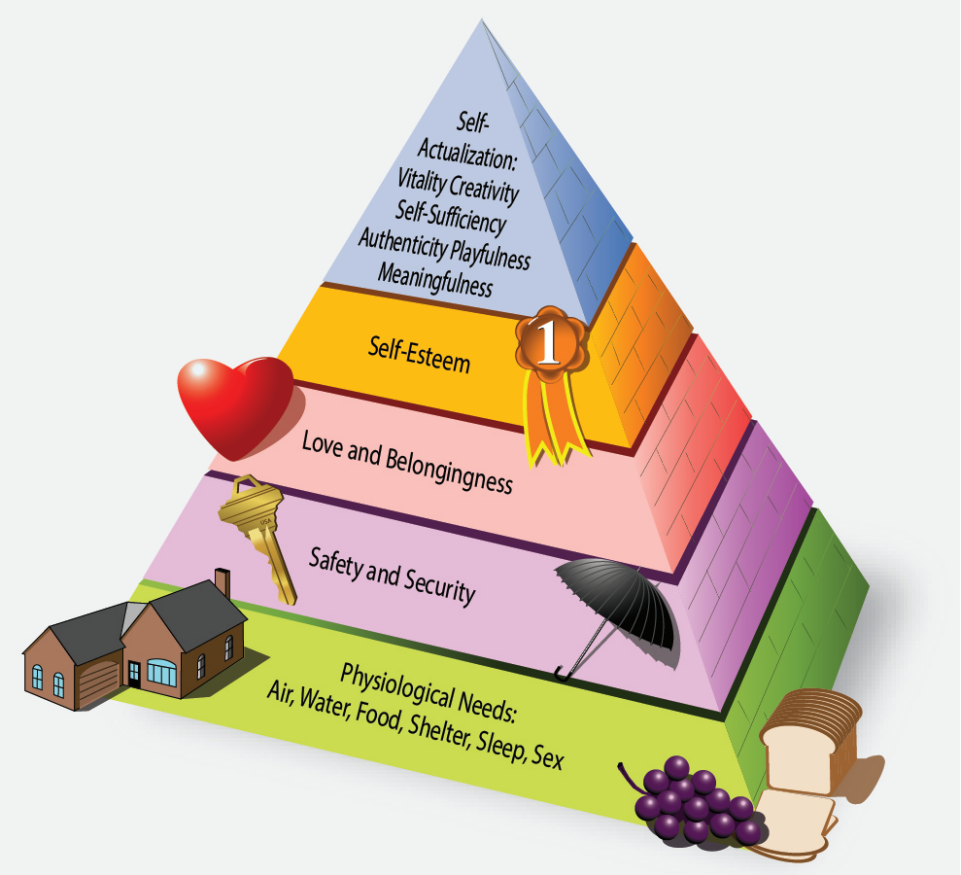

Figure 2-3. *Maslow's Hierarchy of Needs.*

Many learners are able to complete a maneuver or demonstrate knowledge while being hungry or thirsty, which means that for the most part, the entire need does not have to be fulfilled to 100 percent. What needs to be addressed is whether parts of each level have been met, which allows the focus of perception to be concentrated on the instruction given. It does not matter which order the needs are met, the order has little to no effect on the learner's learning ability. What matters is that the instructor verifies that most of the needs has been met (law of readiness) and is then able to focus the learner's senses (perception) on the lesson.

One of the main responsibilities of an aviation instructor is to help learners learn, which encompasses the law of readiness. To satisfy the law of readiness, an instructor can verify that a learner's needs have been met by conducting a thorough pre-assessment prior to beginning the lesson. The pre-assessment should verify whether the learner is physically and mentally ready to learn.

Meeting Human Needs to Encourage Learning

Physiological

These are biological needs. They consist of the need for air, food, water, and maintenance of the human body. If a learner is unwell, then little else matters. Unless the biological needs are met, a person cannot concentrate fully on learning, self-expression, or any other tasks. Instructors should monitor their learners to make sure that their basic physical needs have been met. A hungry or tired learner may not be able to perform as expected.

Security

Once the physiological needs are met, the need for security becomes active. All humans have a need to feel safe. Security needs are about keeping oneself from harm. If a learner does not feel safe, he or she cannot concentrate. The aviation instructor who stresses flight safety during training mitigates feelings of insecurity. A flight instructor should be aware of his learner's fear of certain flight regions and ease them into those situations carefully.

Belonging

When individuals are physically comfortable and do not feel threatened, they seek to satisfy their social needs of belonging. Maslow states that people seek to overcome feelings of loneliness and alienation. This involves both giving and receiving love, affection, and the sense of belonging. For example, aviation learners are usually out of their normal surroundings during training, and their need for association and belonging is more pronounced. Instructors should make every effort to help new learners feel at ease and to reinforce their decision to pursue a career or hobby in aviation.

Esteem

When the first three classes of needs are satisfied, the need for esteem can become dominant. Humans have a need for a stable, firmly based, high level of self-respect and respect from others. Esteem is about feeling good about one's self. Humans get esteem in two ways: internally or externally. Internally, a person judges himself or herself worthy by personally defined standards. High self-esteem results in self-confidence, independence, achievement, competence, and knowledge.

Most people, however, seek external esteem through social approval and esteem from other people, judging themselves by what others think of them. External self-esteem relates to one's reputation, such as status, recognition, appreciation, and respect of associates.

When esteem needs are satisfied, a person feels self-confident and valuable as a person in the world. When these needs are frustrated, the person feels inferior, weak, helpless, and worthless. Esteem needs not only have a strong influence on the instructor-learner relationship, but also may be the main reason for a learner's interest in aviation training.

Cognitive and Aesthetic

In later years, Maslow added cognitive (need to know and understand) and aesthetic (the emotional need of the artist) needs to the pyramid. He realized humans have a deep need to understand what is going on around them. If a person understands what is going on, he or she can either control the situation or make informed choices about what steps might be taken next. The brain even reinforces this need by giving humans a rush of dopamine whenever something is learned, which accounts for that satisfying "eureka!" moment. For example, a flight learner usually experiences a major "eureka!" moment upon completing the first solo flight.

Aesthetic needs connect directly with human emotions, which makes it a subtle factor in the domain of persuasion. When someone likes another person, a house, a painting, or a song, the reasons are not examined—he or she simply likes it. This need can factor into the learner-instructor relationship. If an instructor does not "like" a learner, this subtle feeling may affect the instructor's ability to teach.

Self-Actualization

When all of the foregoing needs are satisfied, then and only then are the needs for self-actualization activated. Maslow describes self-actualization as a person's need to be and do that which the person was "born to do." To paraphrase an old Army recruiting slogan, self-actualization is to "be all you can be."

Self-actualized people are characterized by:

- Being problem-focused.
- Incorporating an ongoing freshness of appreciation of life.
- A concern about personal growth.
- The ability to have peak experiences.

Helping a learner achieve his or her individual potential in aviation training offers the greatest challenge as well as reward to the instructor.

Instructors should help learners satisfy their human needs in a manner that creates a healthy learning environment. In this type of environment, learners experience fewer frustrations and, therefore, can devote more attention to their studies. Fulfillment of needs can be a powerful motivation in complex learning situations.

Human Nature and Motivation

Human nature refers to the general psychological characteristics, feelings, and behavioral traits shared by all humans. Consider Jason, who came to aviation because he wanted to participate more actively in another realm of his business. Derek needs to capitalize on this motivation to keep Jason interested in the step-by-step procedures that need to be learned in order to fly safely. There is a gap between Jason and his goal of earning a pilot certificate. It is Derek's job to close the gap. The successful instructor channels learner motivation and guides the learner toward the goal of obtaining aviation skills through education, experience, practice, and study.

The psychologist and Nobel Prize winner in Economics, Daniel Kahneman, summarized his findings of human behavior in his book titled, *Thinking, Fast and Slow*. Simply, he outlines that two systems of thought constantly compete for control over our behaviors that affect decision-making. The first system (fast) is the automatic reaction that individuals have developed through memory and experience. The second system (slow) relies on logic and reasoning to draw conclusions for the actions one takes. *[Figure 2-4]*

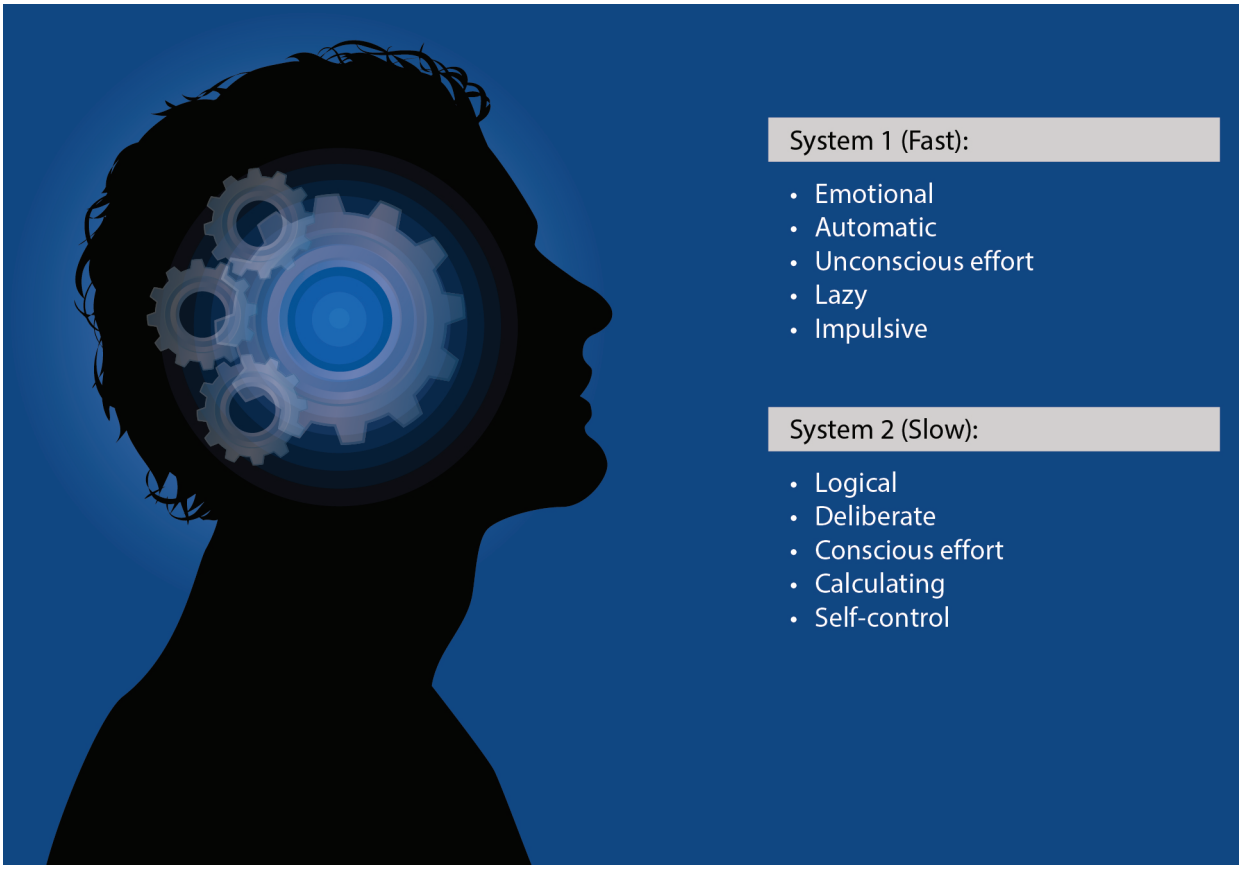

Figure 2-4. *Daniel Kahneman developed a two-system view of human behaviors that affect decision-making: System 1 (fast) represents the automatic responses, while System 2 (slow) represents the more logical and deliberate considerations used for decision-making.*

According to Kahneman's research, System 1 is primarily based in emotion and the unconscious mind. These are automatic "gut reactions" that require little thought or effort by the individual. For example, when presented with the simple math equation 2 + 2 = x, the individual can easily solve the problem where x = 4. The response is instant and likely correct in this example. The inherent risk in using this thought system is that, as Kahneman explains, we are inherently lazy. It is exhausting to put forth the effort required to deliberately concentrate on a problem, especially one that appears to be so easy. This can lead to poor decision-making due to the assumption that the task at hand is as simple as past, similar, experiences suggest it to be.

In contrast, individuals rely on System 2 less frequently as it requires conscious effort to calculate and reason through a problem, and because of this System 2 is comparatively slower than System 1. While someone can easily solve the equation 2 + 2 = x, the average person needs to pause and consider an answer if presented with a more difficult problem such as 48 × 76 = y. This system demands considerable effort and self-control of the individual and as a result, it is tempting to revert to the relative ease of System 1. In fact, once the immediate problem is solved, System 1 takes over again.

Understanding how these systems affect our decision-making can help instructors be more aware of learner pitfalls, such as assuming a complex problem is a simple one, or assuming that because a recent task led to a solution that the same solution can be used correctly for a similar task.

Since it is human nature to be motivated, the responsibility for discovering how to realize the potential of the learner lies with the instructor. How to mold a solid, healthy, productive relationship with a learner depends on the instructor's knowledge of human behavior and needs. Being able to recognize factors that inhibit the learning process also helps the instructor in this process.

Defense Mechanisms

Defense mechanisms can be biological or psychological. The biological defense mechanism is a physiological response that protects or preserves organisms. For example, when humans experience a danger or a threat, the "fight or flight" response kicks in. Adrenaline and other chemicals are activated and physical symptoms such as rapid heart rate and increased blood pressure occur.

For example, when an anxious learner pilot reacts to impending and full stalls during practice, the anxiety that the learner pilot may feel may resolve itself into a "fight or flight" response. There may be limited time to analyze the problem. Therefore, the learner needs the opportunity to experience and develop a comfort level that mitigates the anxiety.

The instructor needs to recognize the learner's apprehension about performing the recovery techniques and help them gain the necessary skill level to feel comfortable with the maneuver. In this case, the instructor could take the procedure apart and demonstrate each stage of an impending or full stall. Allowing the learner to then practice the stages in various realistic scenarios should instill the confidence needed to master the stall recovery.

Sigmund Freud introduced the psychological concept of the ego defense mechanism in 1894. The ego defense mechanism is an unconscious mental process to protect oneself from anxiety, unpleasant emotions, or to provide a refuge from a situation with which the individual cannot currently cope. For example, someone who blots out the memory of being physically assaulted is using a defense mechanism. People use these defenses to prevent unacceptable ideas or impulses from entering the conscious mind. Defense mechanisms soften feelings of failure, alleviate feelings of guilt, help an individual cope with reality, and protect one's self-image. *[Figure 2-5]*

When anxiety occurs, the mind tries to solve the problem or find an escape, but if these tactics do not work, defense mechanisms are triggered. Defense mechanisms share two common properties:

- They often appear unconsciously.
- They tend to distort, transform, or otherwise falsify reality.

Because reality is distorted, perception changes, which allows for a lessening of anxiety, with a corresponding reduction in tension. Repression and denial are two primary defense mechanisms.

Repression

Repression is the defense mechanism whereby a person places uncomfortable thoughts into inaccessible areas of the unconscious mind. Things a person is unable to cope with now are pushed away, to be dealt with at another time, or hopefully never because they faded away on their own accord. The level of repression can vary from temporarily forgetting an uncomfortable thought to amnesia, where the events that triggered the anxiety are deeply buried. Repressed memories do not disappear and may reappear in dreams or slips of the tongue ("Freudian slips"). For example, a learner pilot may have a repressed fear of flying that inhibits his or her ability to learn how to fly.

Denial

Denial is a refusal to accept external reality because it is too threatening. It is the refusal to acknowledge what has happened, is happening, or will happen. It is a form of repression through which stressful thoughts are banned from memory. Related to denial is minimization. When a person minimizes something, he or she accepts what happened, but in a diluted form.

For example, the instructor finds a water bottle under the rudder pedal of an aircraft the student took on a solo flight and explains the hazards of loose objects in the cabin. The learner, unwilling to accept the reality that his or her inattention could have caused an aircraft accident, denies having been inattentive on previous day. Or, the learner minimizes the incident, accepting he or she left the water bottle pointing out that nothing bad happened as a result of the action.

Figure 2-5. *Several common defense mechanisms may apply to aviation learners.*

Other defense mechanisms include but are not limited to the following:

Compensation

Compensation is a process of psychologically counterbalancing perceived weaknesses by emphasizing strength in other areas. Through compensation, learners often attempt to disguise the presence of a weak or undesirable quality by emphasizing a more positive one. The "I'm not a fighter, I'm a lover" philosophy can be an example of compensation. Compensation involves substituting success in a realm of life other than the realm in which the person suffers a weakness.

Projection

Through projection, an individual places his or her own unacceptable impulses onto someone else. A person relegates the blame for personal shortcomings, mistakes, and transgressions to others or attributes personal motives, desires, characteristics, and impulses to others. The learner pilot who fails a flight exam and says, "I failed because I had a poor examiner" believes the failure was not due to a lack of personal skill or knowledge. This learner projects blame onto an "unfair" examiner.

Learners who believe their instruction is inadequate, or that their efforts are not conscientiously considered and evaluated, do not learn well. In addition, their motivation suffers no matter how intent they are on learning to fly. Motivation also declines when a learner believes the instructor is making unreasonable demands for performance and progress. *[Figure 2-6]*

Assignment of difficult, but possible, goals usually provides a challenge and promotes learning. In a typical flight lesson, reasonable goals are listed in the lesson objectives and the desired levels of proficiency for the goals are included in statements that contain completion standards.

Rationalization

Rationalization is a subconscious technique for justifying actions that otherwise would be unacceptable. When true rationalization takes place, individuals sincerely believe in the plausible and acceptable excuses which seem real and justifiable. For example, a learner mechanic performs poorly on a test. He or she may justify the poor grade by claiming there was not enough time to learn the required information. The learner does not admit to failing to join the class study group or taking the computer quiz offered by the instructor.

Reaction Formation

In reaction formation a person fakes a belief opposite to the true belief because the true belief causes anxiety. The person feels an urge to do or say something and then actually does or says something that is the opposite of what he or she really wants. For example, a learner may develop a who-cares-how-other-people-feel attitude to cover up feelings of loneliness and a hunger for acceptance.

Figure 2-6. *The assignment of impossible or unreasonable goals discourages the learner, diminishes effort, and retards the learning process.*

Fantasy

Fantasy occurs when a learner engages in daydreams about how things should be rather than doing anything about how things are. The learner uses his or her imagination to escape from reality into a fictitious world—a world of success or pleasure. However, if a learner gets sufficient satisfaction from daydreaming, he or she may stop trying to achieve goals altogether. Perhaps the transitioning pilot is having trouble mastering a more complex aircraft, which jeopardizes his or her dream of becoming an airline pilot. It becomes easier to daydream about the career than to achieve the certification. Lost in the fantasy, the learner spends more time dreaming about being a successful airline pilot than working toward the goal. When carried to extremes, the worlds of fantasy and reality can become so confused that the dreamer cannot distinguish one from the other.

Displacement

This defense mechanism results in an unconscious shift of emotion, affect, or desire from the original object to a more acceptable, less threatening substitute. Displacement avoids the risk associated with feeling unpleasant emotions and puts them somewhere other than where they belong. For example, the avionics learner is angry with the instructor over a grade received but fears displaying the anger could antagonize the instructor. The learner might choose to direct the anger towards a different object without risking consequences related to the class.

Psychology textbooks or online references offer more in-depth information about defense mechanisms. While most defense mechanisms fall within the realm of normal behavior and serve a useful purpose, in some cases they may be associated with mental health problems. Defense mechanisms involve some degree of self-deception and distortion of reality. Thus, they alleviate the symptoms, not the causes, and do not solve problems. Moreover, because defense mechanisms operate on an unconscious level, they are not subject to normal conscious checks and balances. Once an individual realizes there is a conscious reliance on one of these devices, behavior ceases to be an unconscious adjustment mechanism and becomes, instead, an ineffective way of satisfying a need.

It may be difficult for an instructor to identify excessive reliance on defense mechanisms by a learner, but a personal crisis or other stressful event is usually the cause. For example, a death in the family, a divorce, or even a failing grade on an important test may trigger harmful defensive reactions. Physical symptoms such as a change in personality, angry outbursts, depression, or a general lack of interest may point to a problem. Drug or alcohol abuse also may become apparent. Less obvious indications may include social withdrawal, preoccupation with certain ideas, or an inability to concentrate.

An instructor needs to be familiar with typical defense mechanisms and have some knowledge of related behavioral problems. A perceptive instructor can help by using common sense and discussing the problem with the learner. The main objective should be to restore motivation and self-confidence. It should be noted that the human psyche is fragile and could be damaged by inept measures. Therefore, in severe cases involving the possibility of deep psychological problems, timely and skillful help is needed. In this event, the instructor should recommend that the learner use the services of a professional counselor.

Learner Emotional Reactions

While it is not necessary for a flight instructor to be a certified psychologist, it is helpful to learn how to analyze learner behavior before and during each flight lesson. This ability helps a flight instructor develop and use appropriate techniques for instruction yet to occur.

Anxiety

Anxiety is probably the most significant psychological factor affecting flight instruction. This is true because flying is a potentially threatening experience for those who are not accustomed to flying and the fear of falling is universal in human beings. While anxiety is a factor associated with aviation activities where lives depend on consistently doing the job right, the following paragraphs are primarily concerned with instruction and learner reactions.

Anxiety is a feeling of worry, nervousness, or unease, often about something that is going to happen, typically something with an uncertain outcome. It results from the fear of anything, real or imagined, which threatens the person who experiences it, and may have a potent effect on actions and the ability to learn from perceptions.

The responses to anxiety range from a hesitancy to act to the impulse to do something even if it's wrong. Some people affected by anxiety react appropriately, adequately, and more rapidly than they would in the absence of threat. Many, on the other hand, may freeze and be incapable of doing anything to correct the situation that has caused their anxiety. Others may do things without rational thought or reason.

Both normal and abnormal reactions to anxiety are of concern to the flight instructor. The normal reactions are significant because they indicate a need for special instruction to relieve the anxiety. The abnormal reactions are even more important because they may signify a deep-seated problem.

Anxiety can be countered by reinforcing the learners' enjoyment of flying and by teaching them to cope with their fears. An effective technique is to treat fears as a normal reaction, rather than ignoring them. Keep in mind that anxiety for learner pilots is usually associated with certain types of flight operations and maneuvers. Instructors should introduce these maneuvers with care, so that learners know what to expect and what their reactions should be. When introducing stalls, for example, instructors should first review the aerodynamic principles and explain how stalls affect flight characteristics. Then, carefully describe the physical sensations to be expected, as well as the recovery procedures.

Learner anxiety can be minimized throughout training by emphasizing the benefits and pleasurable experiences that can be derived from flying, rather than by continuously citing the unhappy consequences of faulty performances. Safe flying practices should be presented as conducive to satisfying, efficient, uninterrupted operations, rather than as necessary only to prevent catastrophe.

Impatience

Impatience is a greater deterrent to learning pilot skills than is generally recognized. For a learner, this may take the form of a desire to make an early solo flight, or to set out on cross-country flights before the basic elements of flight have been learned.

The impatient learner fails to understand the need for preliminary training and seeks only the ultimate objective without considering the means necessary to reach it. With every complex human endeavor, it is necessary to master the basics if the whole task is to be performed competently and safely. The instructor can correct learner impatience by presenting the necessary preliminary training one step at a time, with clearly stated goals for each step. The procedures and elements mastered in each step should be clearly identified when explaining or demonstrating the performance of the subsequent step.

Impatience can result from instruction keyed to the pace of a slow learner when it is applied to a motivated, fast learner. It is just as important that a learner be advanced to the subsequent step as soon as one goal has been attained, as it is to complete each step before the next one is undertaken. Disinterest grows rapidly when unnecessary repetition and drill are requested on operations that have already been adequately learned.

Worry or Lack of Interest

Worry or lack of interest has a detrimental effect on learning. Learners who are worried or emotionally upset are not ready to learn and derive little benefit from instruction. Worry or distraction may be due to learner concerns about progress in the training course, or may stem from circumstances completely unrelated to their instruction. Significant emotional upsets may be due to personal problems, emotional problems, or a dislike of the training program or the instructor.

The experiences of learners outside their training activities affect behavior and performance in training; the two cannot be separated. When learners begin flight training, they bring with them their interests, enthusiasms, fears, and troubles. The instructor cannot be responsible for these outside diversions, but cannot ignore them because they have a critical effect on the learning process. Instruction should be keyed to the utilization of the interests and enthusiasm learners bring with them, and to diverting their attention from their worries and troubles to learning the tasks at hand. This is admittedly difficult, but needs to be accomplished if learning is to proceed at a normal rate.

Worries and emotional upsets that result from a flight training course can be identified and addressed. These problems are often due to inadequacies of the course or of the instructor. The most effective cure is prevention. The instructor should be alert and ensure the learners understand the objectives of each step of their training, and that they know at the completion of each lesson exactly how well they have progressed and what deficiencies are apparent. Discouragement and emotional upsets are rare when learners feel that nothing is being withheld from them or is being neglected in their training.

Physical Discomfort, Illness, Fatigue, and Dehydration

Physical discomfort, illness, and fatigue will slow the rate of learning during both classroom instruction and flight training. Learners who are not completely at ease, and whose attention is diverted by discomforts such as the extremes of temperature, poor ventilation, inadequate lighting, or noise and confusion, cannot learn at a normal rate. This is true no matter how diligently they attempt to apply themselves to the learning task.

A minor illness such as a cold, or a major illness or injury interferes with the normal rate of learning. This is especially important for flight instruction. Most illnesses adversely affect the acuteness of vision, hearing, and feeling, all of which are essential to correct performance.

Airsickness can be a great deterrent to flight instruction. A learner who is airsick or bothered with incipient airsickness is incapable of learning at a normal rate. There is no sure cure for airsickness, but resistance or immunity usually can be developed in a relatively short period of time. An instructional flight should be terminated as soon as incipient sickness is experienced. As the learner develops immunity, flights can be increased in length until normal flight periods are practicable.

Keeping learners interested and occupied during flight is a deterrent to airsickness. They are much less apt to become airsick while operating the controls themselves. Blowing fresh air across the face also helps reduce symptoms of incipient sickness. Rough air and unexpected abrupt maneuvers tend to increase the chances of airsickness. Tension and apprehension contribute to airsickness and should be avoided.

Fatigue

Fatigue is one of the most treacherous hazards to flight safety as it may not be apparent to a pilot until serious errors are made. Fatigue can be either acute (short-term) or chronic (long-term). Acute fatigue, a normal occurrence of everyday living, is the tiredness felt after long periods of physical and mental strain, including strenuous muscular effort, immobility, heavy mental workload, strong emotional pressure, monotony, or lack of sleep.

Acute fatigue caused by training operations may be physical or mental, or both. It is not necessarily a function of physical strength or mental acuity. The amount of training any learner can absorb without incurring debilitating fatigue varies. Generally speaking, complex operations tend to induce fatigue more rapidly than simpler procedures do, regardless of the physical effort involved. Fatigue is the primary consideration in determining the length and frequency of flight instruction periods and flight instruction should be continued only as long as the learner is alert, receptive to instruction, and is performing at a level consistent with experience.

It is important for a flight instructor to be able to detect fatigue, both in assessing a learner's substandard performance early in a lesson, and also in recognizing the deterioration of performance. If fatigue occurs as a result of application to a learning task, the learner should be given a break in instruction and practice.

A flight instructor who is familiar with the signs indicative to acute fatigue will be more aware if the learner is experiencing them. The deficiencies listed below are apparent to others before the individual notices any physical signs of fatigue.

Acute fatigue is characterized by:

- Inattention
- Distractibility
- Errors in timing
- Neglect of secondary tasks
- Loss of accuracy and control
- Lack of awareness of error accumulation
- Irritability

Another form of fatigue is chronic fatigue which occurs when there is not enough time for a full recovery from repeated episodes of acute fatigue. Chronic fatigue's underlying cause is generally not "rest-related" and may have deeper points of origin. Therefore, rest alone may not resolve chronic fatigue.

Chronic fatigue is a combination of both physiological problems and psychological issues. Psychological problems such as financial, home life, or job-related stresses cause a lack of qualified rest that is only solved by mitigating the underlying problems before the fatigue is solved. Without resolution, human performance continues to deteriorate, and judgment becomes impaired so that unwarranted risks may be taken. Recovery from chronic fatigue requires a prolonged and deliberate solution. In either case, unless adequate precautions are taken, personal performance could be impaired and adversely affect pilot judgment and decision-making.

Dehydration and Heatstroke

Dehydration is the term given to a critical loss of water from the body. Dehydration reduces a pilot's level of alertness, producing a subsequent slowing of decision-making processes or even the inability to control the aircraft. The first noticeable effect of dehydration is fatigue, which in turn makes top physical and mental performance difficult, if not impossible. Flying for long periods in hot summer temperatures or at high altitudes increases susceptibility to dehydration. High altitude is an issue since dry air at high altitudes tends to increase the rate of water loss from the body. If this fluid is not replaced, fatigue progresses to dizziness, weakness, nausea, tingling of hands and feet, abdominal cramps, and extreme thirst.

Heatstroke is a condition caused by any inability of the body to control its temperature. Onset of this condition may be recognized by the symptoms of dehydration, but its recognition may occur too late if it results in a sudden complete collapse. To prevent these symptoms, it is recommended that an ample supply of water be carried and used at frequent intervals on any long flight, whether the pilot is thirsty or not. If the airplane has a canopy or roof window, wearing light-colored, porous clothing and a hat helps provide protection from the sun. Keeping the flight deck well ventilated aids in dissipating excess heat.

Apathy Due to Inadequate Instruction

Learners can become apathetic when they recognize that the instructor has made inadequate preparations for the instruction being given, or when the instruction appears to be deficient, contradictory, or insincere. To hold the learner's interest and to maintain the motivation necessary for efficient learning, instructors should provide well-planned, appropriate, and accurate instruction. Nothing destroys a learner's interest as quickly as a poorly organized period of instruction. Even an inexperienced learner realizes immediately when the instructor has failed to prepare a lesson. *[Figure 2-7]*

Instruction may be overly explicit and complicated, too elementary, or so general that it fails to evoke the interest necessary for effective learning. To be effective, the instructor teaches for the level of the learner. The presentation should be adjusted to be meaningful to the person for whom it is intended. For example, instruction in the preflight inspection of an aircraft should be presented quite differently for a learner who is a skilled aircraft maintenance technician (AMT) compared to the instruction on the same operation for a learner with no previous aeronautical experience. The instruction needed in each case is the same but a presentation meaningful to one of these learners might not be appropriate for the other.

Poor instructional presentations may result not only from poor preparation, but also from distracting mannerisms, personal untidiness, or the appearance of irritation with the learner. Creating the impression of talking down to the learner is one of the fastest ways for an instructor to lose learner confidence and attention. Once the instructor loses learner confidence, it is difficult to regain, and the learning rate is unnecessarily diminished.

Figure 2-7. *Poor preparation leads to spotty coverage, misplaced emphasis, unnecessary repetition, and a lack of confidence on the part of the learner. The instructor should always have a plan.*

Normal Reactions to Stress

As mentioned earlier in the chapter, when a threat is recognized or imagined, the brain alerts the body. The adrenal gland activates hormones, which prepare the body to meet the threat or to retreat from it—the fight or flight syndrome.

Normal individuals begin to respond rapidly and exactly, within the limits of their experience and training. Many responses are automatic, highlighting the need for proper training in emergency operations prior to an actual emergency. The affected individual thinks rationally, acts rapidly, and is extremely sensitive to all aspects of the surroundings.

Abnormal Reactions to Stress

Reactions to stress may produce abnormal responses in some people. With them, response to anxiety or stress may be completely absent or at least inadequate. Their responses may be random or illogical, or they may do more than is called for by the situation.

During flight instruction, instructors are normally the only ones who can observe learners when they are under pressure. Instructors, therefore, are in a position to differentiate between safe and unsafe piloting actions. Instructors also may be able to detect potential psychological problems. The following learner reactions are indicative of abnormal reactions to stress. None of them provides an absolute indication, but the presence of any of them under conditions of stress is reason for careful instructor evaluation.

- Inappropriate reactions, such as extreme over-cooperation, painstaking self-control, inappropriate laughter or singing, and very rapid changes in emotions.
- Marked changes in mood on different lessons, such as excellent morale followed by deep depression.
- Severe anger directed toward the flight instructor, service personnel, and others.

In difficult situations, flight instructors should carefully examine learner responses and their own responses to the learners. These responses may be the normal products of a complex learning situation but they also can be indicative of psychological abnormalities that inhibit learning or are potentially very hazardous to future piloting operations. *[Figure 2-8]*

Flight Instructor Actions Regarding Seriously Abnormal Learners

A flight instructor who believes a learner may be suffering from a serious psychological abnormality has a responsibility to refrain from instructing that learner. In addition, a flight instructor has the personal responsibility of assuring that such a person does not continue flight training or become certificated as a pilot. To accomplish this, the following steps are available:

- If an instructor believes that a learner may have a disqualifying psychological defect, arrangements should be made for another instructor, who is not acquainted with the learner, to conduct an evaluation flight. After the flight, the two instructors should confer to determine whether they agree that further investigation or action is justified.

- The flight instructor's primary legal responsibility concerns the decision whether to endorse the learner to be competent for solo flight operations, or to make a recommendation for the practical test leading to certification as a pilot. If, after consultation with an unbiased instructor, the instructor believes that the learner may have a serious psychological deficiency, such endorsements and recommendations should be withheld.

Figure 2-8. *A learner with marked changes in mood during different lessons, such as excellent morale followed by deep depression, is indicative of an abnormal reaction to stress.*

AMTs and Flight Instructors as Learners

Both AMTs and flight instructors sometimes deal with new or unfamiliar technology. For instance, an instructor flying a different aircraft may have to manage a particular system or avionics suite for the first time. Likewise, the AMT who is accustomed to working with one type of aircraft has developed analytical processes that may not transfer to another aircraft as well as expected. In both cases, the instructors may be very highly experienced, but change and its associated stress may have risk consequences.

Technological advances in aircraft, powerplants, and systems can outpace the knowledge of flight instructors and AMTs if they don't ensure they remain adequately trained. This ongoing training may remind instructors of their own tendencies to become vulnerable and less objective. By understanding their own training, instructors gain the insight to direct learners to think rationally and overcome stress. Instructors should understand that their own actions and care for others during the training they provide can frame the way a learner responds well into the future.

Diminishing stress and strengthening a learner's confidence and decision-making skills can be achieved by incorporating a risk assessment tool into a training program. Risk assessment tools should always be used to help determine the level of risk involved with any flight so that the pilot or other support person maintains a margin of safety in the activity they are involved. Key to any risk assessment is the individual's objectivity to ensure safety during their flight.

Teaching the Adult Learner

While aviation instructors teach learners of all ages, the average aviation learner age is 30 years old. This means the aviation instructor needs to be versed in the needs of adult learners. The field of adult education is relatively young, having been established in the late twentieth century by Dr. Malcolm Knowles. His research revealed certain traits that need to be recognized when teaching adult learners as well as ways instructors can use these traits to teach older learners.

Adults as learners possess the following characteristics:

- Adults who are motivated to seek out a learning experience do so primarily because they have a use for the knowledge or skill being sought. Learning is a means to an end, not an end in itself.
- Adults seek out learning experiences in order to cope with specific life-changing events—marriage, divorce, a new job. They are ready to learn when they assume new roles.
- Adults are autonomous and self-directed; they need to be independent and exercise control.
- Adults have accumulated a foundation of life experiences and knowledge and draw upon this reservoir of experience for learning.
- Adults are goal-oriented.
- Adults are relevancy oriented. Their time perspective changes from one of postponed knowledge application to immediate application.
- Adults are practical, focusing on the aspects of a lesson most useful to them in their work.
- As do all learners, adults need to be shown respect.
- The need to increase or maintain a sense of self-esteem is a strong secondary motivator for adult learners
- Adults want to solve problems and apply new knowledge immediately.

Instructors should:

- Provide a training syllabus (see Chapter 7, Planning Instructional Activity) that is organized with clearly defined course objectives to show the learner how the training helps him or her attain specific goals.
- Help learners integrate new ideas with what they already know to ensure they keep and use the new information.
- Assume responsibility only for his or her own expectations, not for those of learners. It is important to clarify and articulate all learner expectations early on.
- Recognize the learner's need to control pace and start/stop time.
- Take advantage of the adult preference to self-direct and self-design learning projects by giving the learner frequent scenario based training (SBT) opportunities
- Remember that self-direction does not mean isolation. Studies of self-directed learning indicate self-directed projects involve other people as resources, guides, etc.
- Use books, programmed instruction, and computers which are popular with adult learners.

- Refrain from “spoon-feeding” the learner.
- Set a cooperative learning climate.
- Create opportunities for mutual planning.

An aviation learner may be the retired business executive who always wanted to learn how to fly, an Army helicopter pilot who wants to learn how to fly an airplane, or a former automobile mechanic who decides to pursue avionics. These learners may be financially stressed, or they may be financially secure. They may be healthy but they may be experiencing such age-related problems as diminished hearing or eyesight. Whatever the personal circumstances of the learner, he or she wants the learning experience to be problem-oriented, personalized, and the instructor to be accepting of the learner’s need for self-direction and personal responsibility.

Chapter Summary

This chapter discussed how human behavior affects learning, the effect of human needs on learning, defense mechanisms learners use to prevent learning, how adults learn, and the flight instructor’s role in determining a learner’s future in the aviation community. For more information on these topics, it is recommended the instructor read a general educational psychology text or visit one of the many online sites devoted to education.