## 1.2 Basics of Human Behavior

Human behavior is at the center of our everyday experience; it shapes our lives and the lives of those around us. Behavior and its consequences influence what we learn, who we become, and what we will do. This is the essence and intent of teaching and learning.

Everyone has a vested interest in understanding behavior. Parents, partners, teachers, trainers, co-workers – we all attempt to demystify and influence the behavior of others. Our inherent interest in behavior is a good thing because it motivates us to discover the 'whys' of behavior. However, it can also be unfortunate because the multitude of available 'common sense' explanations for behavior are strong competition for less imaginative, scientifically valid explanations. Although the science of human behavior is complex, there are some basic principles that can help us to better understand not only why we do what we do, but what we can do to improve our knowledge and skills.
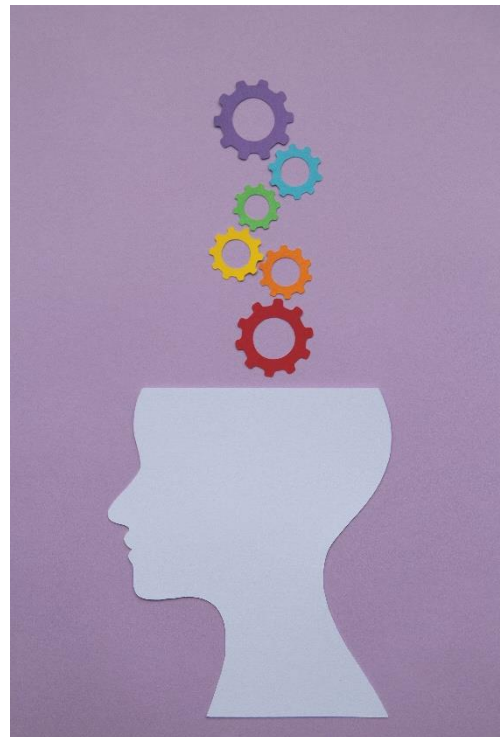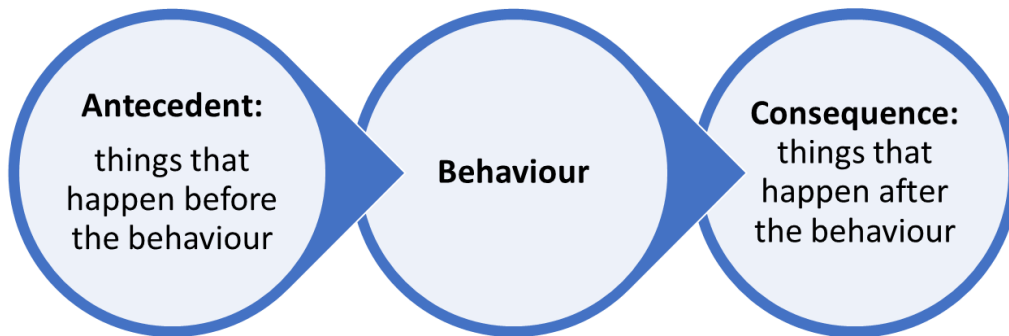
Basic principles

> *Behavior* is everything a person does, including overt behavior like moving and speaking as well as covert behavior like thinking, feeling, and decision-making.

Behavior is everything a person does, including overt behavior, like moving and speaking, as well as covert behavior like thinking, feeling, and decision-making. However, behavioral scientists view behavior not in isolation, but as a whole unit comprising behavior and context. Examining behavior involves understanding not just the action itself, but the important aspects of the context in which that action occurs. These aspects can be boiled down to the things that happen before behavior – the situation, or events and conditions that were present when an action occurred, and the results that happen after the behavior – the consequences, or events produced by that same action.

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Here are two simple examples of behavior in context:

Scenario 1

Situation	There is a red warning light indicating the kitchen stove is hot.
Behavior	I touch the stove.
Consequence	My finger is burned, and it is painful.
Future Behavior	Next time I see that red warning light, I won't touch the stove, so I don't get burned again.

Scenario 2

Situation	I'm at a bakery and I'm hungry.
Behavior	I purchase a slice of pink cake.
Consequence	I find the pink cake to be delicious and am no longer hungry.
Future Behavior	Next time I am hungry and nearby the bakery, I may very well purchase the pink cake again.

We are all (willing or unwilling, intentional, or unintentional) behavioral engineers, and we benefit from understanding that the only way to sustainably influence anyone's behavior, including our own, is by shaping the context in which it occurs. One way to influence behavior is to change the situation. Some examples of situations or things that happen before behavior include the physical environment, any form of training, job aid, checklist, cue or reminder. These things all occur before we behave and, in many cases, occur before we enter the operational environment. Let us see how this looks in practice.

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Suppose we aim to ensure first officers are comfortable pointing out a risky situation to the captain, so we provide training on the appropriate competency and observable behavior:

Scenario 3

Situation	The first officer (FO) and captain have received training on the relevant pilot competency and associated observable behavior; during today's flight the FO recognizes a risk worth reporting to the captain.
Behavior	The FO advises the captain of a risk.
Consequence	The Captain thanks the FO for their observation and the risk is mitigated.
Future Behavior	The FO will be happy to report all observed risks to the captain.

In the above scenario, the situation itself has an influence on behavior. Without prior training, the first officer and the captain may not have independently developed the competencies required to allow this behavior. Often, using interventions like training can cue the desired behavior, and no other interventions are necessary. However, there are limitations to influencing only the situation present before behavior. If these cues fail to match the real-world consequences we encounter, they will not be influential for long. Here is an example of how that might happen:

Scenario 4

Situation	The first officer and captain have had training on the pilot competency framework and associated observable behaviors, but the captain has simply played along during training and has not taken to heart the feedback received during training. During today's flight the FO recognizes a risk worth reporting to the captain.
Behavior	The FO advises the captain of the risk.
Consequence	The captain tells the FO to mind their own business and stop worrying.
Future Behavior	The FO may choose not to report risks to the captain.

Note how the situations and behaviors of the first officer in scenarios 3 and 4 are almost exactly the same. Viewed in isolation, the first officer's behavior itself does not say much about why it is occurring. In this case, any behavioral evidence of prior training may be completely absent in future behavior. In other words, despite having attended the same training, this FO may never challenge this captain again because of the consequences experienced in the 'real world'.

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It is the relationships that form between actions and contexts that explain and predict future behavior. In scenarios 3 and 4, it is the consequence applied by the captain that leads to the change in future behavior on the part of the first officer. It is important to understand the power of consequences; this is how sustainable learning happens. If consequences shape our future behavior, how can we use this idea to improve training and learning?

Defining Behavior

If we aim to influence behavior, we must first create a shared understanding of the desired or undesired behavior, and for that reason, behavior should be defined in a way that is as objective as possible. This helps to reduce the amount of interpretation required by others, ensuring most people observing the behavior would agree that it either has or has not happened. Here are some examples of the way we could define behavior:

Example 1

Statement 1: The captain has a great attitude.

Statement 2: The captain demonstrated exemplary Leadership and Teamwork.

Statement 3: The captain led and worked as a team member in an exemplary manner, by always demonstrating the following OBs, which enhanced safety .
- Encourages team participation and open communications
- Considers inputs from others
- Gives and receives feedback constructively

An example of this performance is when he responded to the first officer's concern by saying, "I really appreciate you bringing that to my attention. I agree that the safest course of action would be to wait until that weather clears".

Example 2

Statement 1: The cadet is a poor team member.

Statement 2: The cadet has trouble expressing thoughts and ideas in a team setting.

Statement 3: When the cadet made a suggestion during today's group exercise, he spoke so quietly that the other team members may not have heard, and they did not respond to his suggestion. Then the cadet backed away from the table and folded his arms. He did not make any more suggestions for the remainder of the exercise.

Most of us are accustomed to discussing behavior at the level of detail found in statement 1 of both examples. However, each of us will have a slightly different image

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in our minds after reading statement 1, and the image that comes to mind is a result of our unique personalities and histories. This is perfectly fine if we are not attempting to influence behavior, but which statement is most clear? Which statement would be the most helpful way to phrase feedback meant to shape behavior? In many cases, the level of detail found in statement 2 may be sufficient, but when providing or receiving feedback to an individual or in a training report, statement 3 is the best way to go. This level of detail minimizes the risk of miscommunication.

Kind and Wicked Learning Environments

Although 'common sense' may suggest that experience is enough to acquire knowledge and skills, the consequences that occur naturally after behavior are not always guaranteed to teach the 'right' lessons.

Sometimes, natural consequences are perfectly matched to encourage desired behavior. Psychologist Robin Hogarth[ii] refers to these situations as *kind learning environments*. In a kind learning environment, consequences link outcomes directly to the appropriate actions or judgements and tend to be both accurate and abundant. It is often the case that technical skills are acquired in a kind learning environment, like learning to swing a golf club or learning to land an aircraft. In these cases, consequences are quick, obvious, and always accurate. Any time your landing technique is correct, the outcome should be better than if it was incorrect. Our skills improve with repetition, reliably over time in these environments, as long as we are attentive to outcomes. These kinds of learning environments allow us to develop accurate, intuitive judgements about our own behavior.

> *Kind learning environments* are situations in which consequences link outcomes directly to the appropriate actions or judgements and tend to be both accurate and abundant.

However, not all learning environments are kind, and some are downright wicked. In a *wicked learning environment*, consequences in the form of outcomes of actions are poor, misleading, or altogether missing. Imagine a novice pilot, during simulator training, delaying the decision to land at the nearest suitable airport due to a fire warning, with no safety consequences. Without suitable feedback (for example uncontrollable smoke, or significant system failures), she might never appreciate the potential outcome of her poor decisions and wouldn't know how to react correctly, the next time; lessons learned in wicked environments are likely to be mistaken.

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> *Wicked learning environments* are situations in which consequences in the form of outcomes of actions are poor, misleading, or altogether missing.

Nontechnical skills, especially interpersonal skills, are often acquired in a wicked learning environment. The above scenario 4 is a good example of mismatched consequences. In this case, the first officer was behaving as he had been trained, but the captain inadvertently provided a consequence that does not encourage safe behavior. Scenario 3, on the other hand, is an example of a consequence that is likely to encourage safe behavior, despite occurring in the same unreliable, wicked learning environment. When there are mismatched, conflicting consequences for the same behavior (as in scenarios 3 and 4), it becomes difficult to acquire new skills. In these situations, it is important to ensure consequences, typically in the form of verbal feedback, are designed to encourage the acquisition of knowledge and skills.

Summary

- Behavior is everything a person does, including overt behavior like moving and speaking as well as covert behavior like thinking, feeling, and decision-making.
- The only way to sustainably influence anyone's behavior, including our own, is by shaping the context in which it occurs. This can be done by changing the things that happen before behavior (situation) or changing the things that happen after behavior (consequences). However, consequences are what maintain behavior change.
- Kind learning environments are situations in which consequences link outcomes directly to the appropriate actions or judgements and tend to be both accurate and abundant.
- Wicked learning environments are situations in which consequences in the form of outcomes of actions are poor, misleading, or altogether missing.
- To encourage learning, focus on creating kind learning environments where possible and arranging for the provision of helpful consequences in wicked learning environments.

References

[i] Cooper, J. O., Heron, T. E., & Heward, W. L. (2019). *Applied Behavior Analysis (3rd Edition)*. Hoboken, NJ: Pearson Education.

[ii] Hogarth, R. M., Lejarraga, T., & Soyer, E. (2015). The Two Settings of Kind and Wicked Learning Environments. *Current Directions in Psychological Science, 24*(5), 379–385.

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