

isolate and withdraw) and those upsetting thoughts would go away.

While this is an alluring and common thought process, it is a dangerous way to approach deceptive brain messages. The truth is you really are not in control of your deceptive brain messages or uncomfortable sensations—your brain is! This means that you cannot make your thoughts or urges disappear by using willpower alone. Trying to do so is a surefire prescription for discouragement, disappointment, and demoralization.

We see many people making this same error—much to their detriment. When Steve and Sarah believed they could control their unconscious thoughts and urges, they would mentally beat themselves up for not being stronger or better. The reality of the situation is that the brain generates these deceptive brain messages—not the mind—and none of us has a say in when or where those false messages will show up.

To help them understand that they are not to blame for their deceptive brain messages, we taught Steve and Sarah about Free Won't, a term popularized by the well-known neuroscientist Benjamin Libet. In a series of carefully executed scientific experiments completed in the 1980s, Libet studied how people decide whether and when to move their own bodies and what generated the *initial* desire to move. While the meaning of what he discovered is still the subject of passionate disagreement in academic circles, the bottom line for you is this: *Your brain—not your mind—generates the initial desires, impulses, thoughts, and sensations, but you can veto almost any action before it starts.* This means that while you are not responsible for the emergence of thoughts, desires, impulses, urges, or sensations, you *are* responsible for what you do with them once they arise.

Libet himself interpreted his results in this way and emphasized that you have a *choice* in whether or not to respond when your brain puts out the call—this is the essence of Free Won't. As he described it in one of his landmark papers:⁷

The role of conscious free will [aka Free Won't] would be, then, not to initiate a voluntary act but rather to control whether the act takes place. We may view the unconscious initiatives for voluntary actions as “bubbling up” in the brain. The conscious will then selects which of these initiatives may go forward to an action and which ones to veto and abort, with no act appearing.

In other words, what Libet was saying is that you really can't decide or determine what will *initially* grab your attention—your brain does. However, his research also indicated that once your *initial* attention is grabbed, you can determine whether you keep your attention focused on that object (and act on it)

or *veto it* based on the principle of Free Won't.

Free Won't turns out to be of the utmost importance because it tells us that we have, in essence, the power to *veto* almost any action, even though the desire to perform that action is generated by brain mechanisms entirely outside of our conscious attention and awareness. How might that Free Won't express itself? Through Veto Power.

VETO POWER

The ability to *not* act on a deceptive brain message, uncomfortable sensation, or intended habitual response.

Using Veto Power, *our minds can influence our actions* after the brain generates the initial signals and grabs our attention. For you, this means that the *brain* generates the deceptive thoughts, urges, cravings, impulses, and sensations below the level of your consciousness—and that these deceptive brain messages almost literally grab your focus. It's like when something shiny glints in the sun—you didn't cause the object to shine at that moment, but if your eye catches it, you look. It's natural and automatic—mediated by your brain—and not under your control. The same holds true for unwanted thoughts, urges, desires, and impulses: *deceptive brain messages grab your attention, and you are not responsible for that initial attention-grabbing moment.*

While that's true, Veto Power tells us you *can* and *must* veto detrimental actions generated by your brain (i.e., things that will make you feel better momentarily but that are harmful to you) if you want to sculpt a brain that works for you. This is why Step 3: Refocus aims to have you *consciously focus your attention* on wholesome, beneficial actions. Doing so not only helps rewire your brain in positive ways, it also ensures that you *do not act* on the deceptive brain messages that are harmful to you.

Veto Power, not surprisingly, is at the core of our Four Step program because it reassures you that when the brain puts out a false call, you have the power to withhold acting on that seeming command.

Armed with this knowledge, Steve began to take a hard look at his actions and his deceptive brain messages. He realized that his stress level got out of control because he could not see the deceptive brain messages—those telling him everyone else was helpless, that the only way he would be adored was if he gave

people advice, and that he was drinking because everyone else was so needy—for what they were. The reality, of course, was far from what his brain was telling him. In fact, his coworkers and family could make decisions on their own and they did take responsibility for many things throughout the day—things that Steve never saw them doing. As for his drinking, he accepted that he alone was responsible for making the decision to escape reality in this way, rather than talking with people about how he was feeling or what his deceptive brain messages were falsely telling him.

Steve vowed to stop giving in to the urges and to find constructive ways of dealing with his frustration and anger. Rather than taking a drink, he would express when he was feeling stressed and would look at the situation from the more loving, rational perspective of his Wise Advocate. With time and considerable effort, Steve was able to stop drinking and stop taking on everyone's problems. Instead, he actively directed his attention toward things that mattered to him, such as going to the gym, expressing how he felt, and spending more quality time with his family.

In the next chapter, we'll revisit Kara, whom you met in chapter 1. Through her story, you will learn more about the powerful brain biology that generates the uncomfortable sensations and habitual responses associated with deceptive brain messages.

Summary

- Hebb's law: Neurons/brain regions that fire together wire together.
- Quantum Zeno effect is the glue that holds brain regions in activated states long enough for them to wire together.
- Attention density is the key ingredient to getting the quantum Zeno effect to work.
- When you repeatedly focus your attention on specific behaviors, Hebb's law and the quantum Zeno effect create brain circuits associated with those actions.
- When you repeat the behavior numerous times, neuroplasticity helps it become the preferred action for similar situations.
- Combined, Hebb's law, the quantum Zeno effect, and neuroplasticity explain how habits get wired into your brain and why they are so

difficult to change once they are established.

- How *often* (how repetitively) you focus on something determines which habits stay and which ones go.
- Cravings get stronger because these maladaptive brain circuits are being used more often.
- Free Won't tells you that you are not causing these thoughts, impulses, and urges—your brain is!
- Veto Power encourages you to resist the destructive messages and urges coming from your brain.
- When you focus your attention on constructive, healthy behaviors, your brain is rewired via Self-Directed Neuroplasticity to make those actions the preferred ones—this is how you change your brain!

CHAPTER 4

Why These Sensations Feel So Real

The Biology of Deceptive Brain Messages

In chapter 1, you met Kara, a twenty-five-year-old woman who held negative beliefs about her body image. From her story, you learned about the cycle of deceptive brain messages and began to identify how these negative communications are affecting you.

You also learned that your mind is your biggest ally. It gives you the capacity to choose where to focus your attention so that your actions align with your true self. As you've seen from the stories we've shared with you, recruiting and directing the mind is difficult, especially when you are dealing with anxiety, depression, addiction, or unhealthy habits. Why is it so hard to engage your mind and overcome the habits fueled by deceptive brain messages? The answer lies in your brain—in the way it is wired and how it functions. In this chapter, we will follow what happened inside Kara's brain whenever a deceptive message struck. Through her story, you will learn the brain areas involved and how the cycle of deceptive brain messages is maintained by some powerful brain biology.

To remind you, Kara had been dieting, bingeing, and purging since her teens. Her deceptive brain messages usually began with a negative thought about her appearance and an assertion that she was unlovable unless she was physically perfect. These thoughts caused uncomfortable emotional sensations in her—a feeling that she was “disgusting”—and she experienced a strong physical sensation to diet excessively or purge. Her distress rose until she could no longer tolerate the sensations. At that point, she gave in to the deceptive brain message by severely limiting her intake or purging. Once she did, her distress dissolved and all felt right in the world again—until another deceptive brain message

struck.

Those moments of relief were few and far between because Kara's deceptive brain messages would strike often. As you now know, the more she gave in to the deceptive brain messages, the stronger the brain circuits supporting those uncomfortable sensations and habitual responses became. Kara's struggle really was about dealing with the incredibly intense and uncomfortable sensations she experienced and the habitual responses she engaged in whenever a deceptive brain message surfaced. We have referred to the process of doing almost anything to get rid of the uncomfortable sensations by automatically responding with detrimental actions as *feeding the monster* because this phrase perfectly encapsulates what is happening in the brain.

As you learned in chapter 3, the monster gets fed whenever Hebb's law and the quantum Zeno effect are working together. Learning how to make these laws work *for* you, and not *against* you, is a key to better functioning and better health. The question that remains is this: How does the monster generate these horrendously uncomfortable sensations and why do they cause you to act in ways that are detrimental to you?

Figure 4.1 depicts the process of how a deceptive brain message progresses to unhealthy behaviors and habits. After a deceptive brain message arises, you experience intensely uncomfortable sensations that can be physical (such as rapid heartbeat, shallow breathing, sweating, or cravings) or emotional (such as fear, anger, anxiety, or sadness). Because of how unpleasant and powerful the sensations are, you feel an urgent desire to make these sensations go away. As a result, you respond in an *automatic* (habitual) way that is ultimately unhelpful or unhealthy for you.

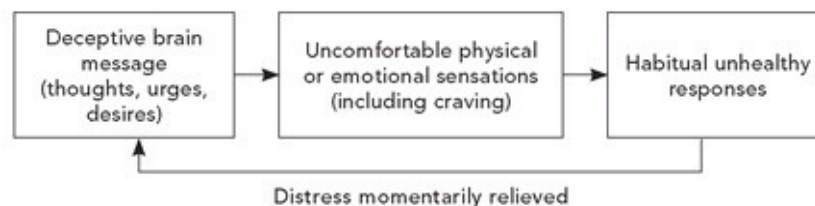


Figure 4.1. Cycle of Deceptive Brain Messages

Biology Underlying Deceptive Brain Messages and Habits

Kara described experiencing a deceptive brain message followed by an intensely uncomfortable sensation that she desperately wanted to go away. Her response to this sensation was to engage in purging, bingeing, or excessive dieting to alleviate her distress. What caused Kara's deceptive brain messages? While it is not clear exactly how deceptive messages originate in the brain, they likely have some roots in these brain areas:

- *Frontal cortex*—the part of the brain involved in strategy, organization, detecting errors, and more, also known as the *Executive Center*
- *Hypothalamus*—the part of the brain involved in hunger, thirst, sex, and other basic bodily drives, also called the *Drive Center*

Note: It is *much* less important that you know the names of where the deceptive brain messages emanate from and more important to realize why you feel the way you do once the thought emerges. We simply want to stress that the brain has a lot to do with causing these upsetting sensations—and that these sensations are not the real you.

As the deceptive brain message arose, Kara's feeling of distress intensified because one or both of the following brain areas were activated:

- *Amygdala*—responsible for generating feelings of fear and physical sensations, such as rapid heartbeat, shortness of breath, and sweating.⁸ The amygdala also assesses threats and sends signals that indicate that “this is something to fear and/or to avoid” or “this is safe.”
- *Insula*—responsible for generating “gut-level responses,” such as dread or what many would describe as a “pit in my stomach,” “gut-wrenching pain,” and similar sensations.

Along with either the amygdala or insula, an adjacent area in Kara's brain was activated: the *anterior cingulate*. When the anterior cingulate is active, you can get a rapid sense that something is wrong (one famous brain researcher calls this the “Oh Shit!” area of the brain), because this brain region is intimately involved with detecting errors and assessing risks and rewards.⁹

Collectively, you can think of the amygdala, insula, and anterior cingulate as the warning center of the brain, or what we like to call the *Uh Oh Center*. When these areas are active, you can get an overwhelming sensation that something is wrong or off. As that overpowering sensation of “uh oh!” arises, you experience

an incredibly uncomfortable state in which you will do almost anything, including following your old ways—your habits, avoidance, whatever it is that you normally do when confronted with a situation similar to the one presently in front of you—to rid yourself of the distress. This is when the *basal ganglia* kick into action.

The basal ganglia are responsible for your *automatic* thoughts and actions—your habits, both physical and mental. In reality, the basal ganglia are composed of two major structures: the *caudate* (responsible for automatic thoughts) and the *putamen* (responsible for automatic actions/ movements). For the purposes of this book, we have chosen to talk about the basal ganglia as one unit because it is responsible for your habitual ways of thinking *and* your habitual actions. You can think of this as the *Habit Center* of the brain. In the case of deceptive brain messages, this means that every time you have an uncomfortable sensation that you want to get rid of, the basal ganglia are going to play a significant role in determining what you do next.

Note: As we mentioned in chapter 1, we consider the repetitive, automatic thoughts generated by the basal ganglia to be habitual responses. Therefore, when we talk about the Habit Center and habitual responses, we are referring to repetitive thoughts, actions, or inaction—anything that you do repeatedly that is caused by a deceptive brain message and takes you away from focusing on something that is beneficial to you.

Once Kara's Habit Center responded in an *automatic* way to her distress, the uncomfortable sensation very briefly resolved. This created a vicious feedback loop in her brain between the Habit Center and the *frontal cortex* (*Executive Center*). The frontal cortex *passively* assembled the useless information provided by this feedback loop (i.e., the information was not sent to the attentive mind) and created a repetitive association between the uncomfortable sensation, action, and relief. The result was that the circuit supporting those actions was further strengthened and became even more automatic.

Obviously, the brain is quite complex and the intricacies of its functioning can be confusing. Distilling it down to the most important parts, figure 4.2 outlines how deceptive brain messages result in unhealthy habits (including inaction and repetitive thoughts). This figure illustrates the pattern Kara described in which deceptive brain messages result in harmful actions that bring momentary relief and strengthen harmful brain circuits. Below the descriptions are the centers involved and their associated brain regions. The arrow at the bottom of the figure demonstrates how the repeating circuit is activated over and over when the attentive mind is not engaged or recruited to make new choices.

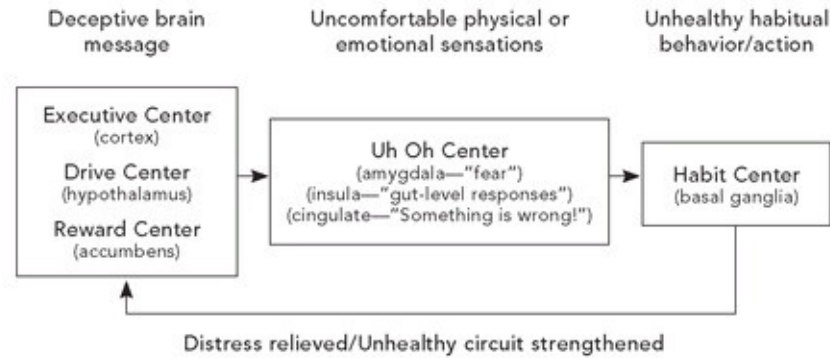


Figure 4.2. Brain Regions Involved in the Cycle of Deceptive Brain Messages

The Executive Center is composed of many brain areas that are involved in strategy, planning, organization, and detecting errors. The Drive Center is where many of our instinctual (life-preserving) drives are generated, whereas the Reward Center is involved in pleasure and obtaining rewards. The Uh Oh Center includes the amygdala (fear, including the related physical sensations of rapid heartbeat, shortness of breath, and so on), insula (gut-level responses, like the sensation of gut churning or a “pit in my stomach”), and cingulate (“Something is wrong!”—assigns emotional significance to events). The Habit Center is where the basal ganglia are located; they are responsible for automatic thoughts and actions.

ACTIONS THAT BRING US MOMENTARY PLEASURE

In this chapter, you learned how Kara’s deceptive brain messages caused her to experience incredibly upsetting emotional and physical sensations that led to unhealthy habits. Her actions were mostly driven *by a desire to rid herself* of these horrible sensations. She was trying to get away from how she was feeling—to avoid feeling so bad.

What about the opposite—when you are craving something that will make you feel good (momentarily), such as candy, fried foods, alcohol, cigarettes, drugs, video games, sex, or shopping? The pattern shown in figure 4.2 is the same regardless of whether you are trying to approach

something to satisfy a desire or avoid something upsetting.

Remember, we defined craving as an uncomfortable sensation and acknowledged that it is difficult for people to see how craving something that brings pleasure and feels good also is an uncomfortable sensation or experience. When people are so focused on the reward, they don't recognize the pain that precedes it. However, if you really stop and experience it, the actual craving *is* painful—your body feels off, your emotional sensations are unpleasant, and you want those sensations to go away, so you do something that makes you feel better. Once you act, you experience a rush or flood of satisfaction. It's the same process that happened in Kara's brain, but the associated relief is far more pleasurable and gratifying—which makes it all the harder to stop the behavior. This means that you truly have to see how detrimental the behavior is for you to change your ways.

The biology generating pleasure is strong for a reason—nature wants us to take care of ourselves, so it developed a region of the brain (the accumbens, also known as the *Reward Center*) to make sure you kept engaging in important survival-based activities, like eating, by making them pleasurable. The problem is many of the things we do, while pleasurable, are not good for us in the long term. Since the Reward Center is intimately connected with the Habit Center, this can mean trouble if the Habit Center is left to its own devices and we do not manage our responses in helpful ways. This is precisely how addictions and other unhealthy behaviors can spiral out of control.

Refusing to Feed the Monster

One of the most upsetting and distressing parts of deceptive brain messages is that the physical and emotional sensations feel so real and overwhelming. When your sense of self is tied to these sensations, you believe that you are the problem and that you are causing these sensations to exist because of who you are or what you crave. As you now know from learning about Free Won't, that simply is not the case. Your brain is responsible for generating these uncomfortable sensations, not you. Even more to the point, these *emotional and physical sensations are not true*. Rather, they are generated as a result of

deceptive brain messages. Knowing that these sensations are false and that acting on them with habitual responses makes you worse—by strengthening the underlying brain circuitry supporting those actions—empowers you to dismiss these false sensations and urges whenever they strike. You now have a compelling reason to refuse to feed the monster each time it appears.

In the next chapter, we will introduce you to John, a man whose sense of self had fused with his deceptive brain messages to the point that he was constantly looking for reassurance that his girlfriend loved him and was committed to their relationship. Through his story, you will learn how he applied the Four Steps to overcome his deceptive brain messages, uncomfortable sensations, and habitual responses.

Summary

- Each time a deceptive brain message arises, it triggers uncomfortable sensations (physical and/or emotional) and a strong urge to engage in a habitual response.
- Acting in a habitual way in response to a deceptive brain message causes the uncomfortable sensations to subside and generates a sense of relief, but almost always causes worsening problems to develop.
- Each time that cycle of deceptive brain message → uncomfortable sensation → habit → momentary relief occurs, the underlying brain circuits are strengthened.
- As the brain circuits strengthen:
 - The deceptive brain messages occur more frequently
 - The uncomfortable sensations become more intense
 - The habits become more entrenched and harder to resist
- The brain centers supporting this cycle include:
 - Uh Oh Center, which sends out a false alarm that “something is wrong!” and generates the uncomfortable physical and emotional sensations

- Habit Center, which is responsible for generating all automatic thoughts and actions
 - Executive Center, which organizes information, plans, and detects errors
 - Drive Center, which generates basic bodily drives
 - Reward Center, which generates pleasure and facilitates urges to seek out pleasurable activities
- When you are able to see that the uncomfortable sensations are generated by the brain, and not by you, you are empowered to make new choices and refuse to give in to the deceptive brain messages.

CHAPTER 5

A New Sense of Self

Overcoming Your Deceptive Brain Messages with the Four Steps

In chapter 4, you learned how the cycle of deceptive brain messages plays out on a biological level. You saw that most deceptive brain messages originate in the Drive, Reward, and Executive centers and that these false messages cause the Uh Oh Center to sound the alarm—generating the uncomfortable physical and emotional sensations you experience. You also learned how those overpowering sensations lead your Habit Center to respond in automatic, repetitive ways that are detrimental to you. The end result is that the brain circuits supporting these thoughts, sensations, and habits are strengthened, making it much harder for you to resist them when they strike again.

John, a thirty-eight-year-old English teacher, knows this cycle all too well. For him, the deceptive brain messages relate to his relationship with his girlfriend, Alicia, whom he has been dating for the past two years. By all standards, they have a loving relationship and each of them is fully committed and faithful to the other. John plans to ask Alicia to marry him soon, but he has nagging—and unfounded—doubts that she might leave him at any moment.

Throughout their relationship, John's deceptive brain messages kept telling him that Alicia is “too good” for him and it is only a matter of time before she figures this out. The false messages told him that to keep her love, he needs to put her first and take care of her above all else (including himself). If he can do whatever will make her happy, maybe then she will stay. His brain has also told him that he cannot be himself, that he is not worthy of Alicia's love the way he is, and that anytime she is upset, it always is his fault.

Because of these incessant deceptive brain messages, John would experience a

surge of nervous energy in his body—a heightened awareness of feeling shaky, anxious (like butterflies in his stomach), and slightly nauseated. When those physical and emotional sensations struck, John would immediately go check his e-mail or call Alicia. Why? He was looking for any evidence he could find that would prove or dispute the deceptive brain messages. Since he believed she was going to leave at any minute, checking e-mail and seeing that she sent him a message would make him feel calmer. He would relax for a few minutes and could go back to focusing on his work—at least until another round of deceptive thoughts would strike.

However, if Alicia did not respond to his most recent e-mail, John would engage in a series of mental rituals to determine if the lack of a response signified anything of importance. He would try to remember what she was doing that day in an attempt to come up with reasons for why she was not getting back to him. If he came up with a plausible reason, he would calm down. If that did not work, he would keep worrying about whether this was a sign that Alicia was about to end their relationship. These concerns would prompt him to check his e-mail again or go down the intellectual path of finding excuses for why she was not communicating with him at that moment.

John was locked in a series of habitual responses that got him nowhere and tormented him. He would keep checking e-mail or compulsively try to come up with reasons for why Alicia was busy—all the while experiencing extremely upsetting physical and emotional sensations. No matter what he did, he was never at peace and never felt reassured that Alicia was committed to the relationship. In short, John had fused his sense of self with the deceptive brain messages so that those false messages became his reality and his truth. In this chapter, we will review how this happens biologically and show you how John overcame his bad brain wiring with the Four Steps.

A (False) Sense of Self

We have been telling you that part of the reason you cannot stop engaging in unhealthy behaviors is that you have bought into your deceptive brain messages and assimilated them into your sense of who you are. Although it may be surprising, integrating your sense of self with deceptive brain messages actually has roots in your brain. Remember the Executive Center we talked about in

chapter 4—the part of your brain that is involved in planning, strategy, organization, detecting errors, and making assessments? It turns out that the Executive Center has specialized regions that focus on information pertaining to “self” versus “non-self.”

The middle part of your Executive Center, called the *medial prefrontal cortex*, is involved in many functions related to thinking about yourself, including your “inner monologue,” envisioning your future, remembering your past, and inferring other people’s states of mind. Nearby is the closely related brain structure called the *orbitofrontal cortex*, which is particularly involved in error messages and obsessions. We call this whole area the *Self-Referencing Center*, because it is focused on internal processes related to you. A key point is that the Self-Referencing Center can act in helpful or unhelpful ways. For example, when the unhelpful aspects of the Self-Referencing Center are active, you might react in an *automatic*, unhealthy way to emotional information, such as Steve drinking to dissolve stress, Ed avoiding auditions, or John repeatedly checking e-mail. You may also take things too personally.

In contrast, the helpful aspects of the Self-Referencing Center are crucial in choosing how to respond in a voluntary way to situations. This part of the brain is intimately involved in social interactions and relating to others—we use the helpful aspects of the Self-Referencing Center to grasp the inner life of both ourselves and others. Thus, there are times when we really need to use the helpful aspects of the Self-Referencing Center to relate to and understand where other people are coming from.

Compare this with the outer part of your Executive Center, known as the *lateral prefrontal cortex*, which is involved in *voluntarily* modulating the responses coming from your Uh Oh Center and overriding actions that your Habit Center wants to initiate. A key job of this part of the brain, which we call the *Assessment Center*, is to help the Self-Referencing Center not take information too personally. The Assessment Center is able to do this because it has the capacity to regulate and calm other areas of the brain, such as the Uh Oh Center, on the basis of information external to yourself and your sensations. In essence, the Assessment Center is distanced from thoughts about yourself, which makes it a very important ally of the Self-Referencing Center. In fact, when the Assessment Center combines with the helpful aspects of the Self-Referencing Center, you are better able to evaluate your deceptive brain messages from a clear perspective, which enables you not to take them too personally.

An analogy that might help put these two areas into perspective comes from the business world. Imagine a junior executive who has never worked anywhere else and who only focuses on what he knows from his experiences at this

company—this is the Self-Referencing Center. Compare this with an experienced senior partner who has worked extensively in the outside world and can rationally evaluate the entire organization because of her wide array of knowledge and experience. This is the Assessment Center. When they combine and balance their perspective and knowledge, they can powerfully shape the company in beneficial ways.

Figure 5.1 reviews these two brain areas in more detail.

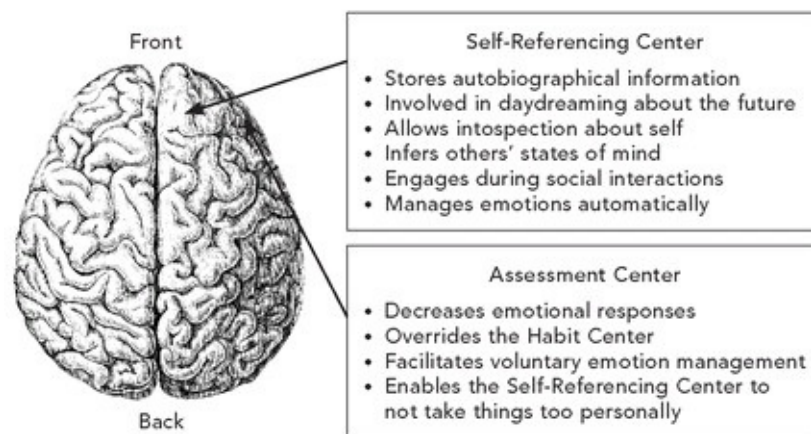


Figure 5.1. Self-Referencing and Assessment Centers

These Emotional Sensations Are Not You!

How is it that your sense of self has been linked so tightly with your deceptive brain messages? One likely reason is that the brain wiring for the Self-Referencing Center is *strongly tied* to the Uh Oh Center. Although this relationship between the Self-Referencing Center and the Uh Oh Center is beneficial in many respects, when these two areas are too tightly connected, you have trouble seeing yourself as distinct from your deceptive brain messages and emotional sensations. Remember what Ed and Sarah talked about—that inability to see life and what is happening as it truly is? The intense connection between the Self-Referencing Center and the Uh Oh Center likely is responsible for that sensation or belief.

When the brain wiring for the Self-Referencing Center and Uh Oh Center becomes too tightly locked together *in an unhelpful way*, it becomes difficult to evaluate reality from an outside perspective (like the Assessment Center can do with the Wise Advocate's help and direction). This means that when the Uh Oh Center's alarm goes off, telling you something is terribly wrong, the unhelpful aspects of the Self-Referencing Center cause you to conclude that the problem is with or about you. (Note: This includes threats in your environment, both emotional and physical.) This happens because the Self-Referencing Center is constantly referring back to you and acts automatically. When it is acting in unhelpful ways, it is not taking in all the information from the environment or processing things in a purely rational way; consider, for example, when John's brain incorrectly assumed that Alicia was leaving him.

The intense connection between the unhelpful aspects of the Self-Referencing Center and Uh Oh Center causes you to believe that your physical and emotional sensations are true. As this happens, you begin to think, "These thoughts and feelings *are me . . . this is who I am.*" The problem with this approach is that you are unable to incorporate other relevant information, consider alternative explanations, or conclude that the situation has nothing to do with you—ultimately limiting your options and responses.

For example, when Sarah was at work, she would often find herself thinking, "Wow, I really didn't like how that person talked to me," or "That was inconsiderate." When supervisors were "abrupt, abrasive, or a little blunt" in offering her feedback, Sarah would feel attacked. She'd leave the interactions feeling confused and shaken up, thinking that people were being cruel for no reason. In most cases, she would then replay the botched interaction over and over in her head, hoping to come to some sort of resolution. She never did. Instead, she would become anxious and conclude that something was wrong with her.

In those moments, Sarah was not considering the possibility that her boss was having a bad day and that his reaction had nothing to do with her at all. Why did she ignore this possibility? The unhelpful aspects of her Self-Referencing Center were filtering out any information that could have helped her reach an alternate conclusion about why he was acting that way. At the same time, her Uh Oh Center was pumping out strong sensations that something was terribly wrong. In reality, nothing was wrong with her. The Uh Oh Center was generating a *false alarm* based on deceptive brain messages. However, because Sarah's deceptive brain messages were making her take things too personally, she concluded that the overpowering sensations coming from her Uh Oh Center had to be real and correct and that the problem must be with her.

With the unhelpful aspects of the Self-Referencing Center in charge, Sarah's Assessment Center could not help her see the larger picture and take in other pieces of information that would have been relevant to her, such as the fact that her boss had just finished having an argument with his girlfriend on the phone and was upset about that interaction. With the mind-set that she was the problem and that the deceptive brain messages and sensations defined her reality, Sarah was not using her Wise Advocate and therefore was not able to use her Assessment Center to its fullest potential. Rather than acting in a voluntary way and choosing the best course of action, Sarah's natural instinct was to alleviate her discomfort. This caused her Habit Center to kick in. As a result, she repetitively thought about ways to make things better (an automatic and habitual response), when in reality there was nothing she could do because she was not the problem.

This same process occurred in John, too. Rather than being able to remember all the ways Alicia had demonstrated her love and commitment to him and believe what he knew in his heart to be true—that she loved him and wasn't going anywhere—John constantly checked e-mail and doubted reality. The unhelpful aspects of his Self-Referencing Center took over and his Uh Oh Center made him feel horrendously anxious and scared most of the time. As a result, he responded in automatic and harmful ways.

We've depicted the process of the unhelpful aspects of the Self-Referencing Center taking over in figure 5.2. Here you can see that when the deceptive brain messages are in full force, the unhelpful aspects of the Self-Referencing Center are active, whereas the Assessment Center is relatively passive or dormant (shown as dashed boxes and dashed arrows).¹⁰ When this happens, it is difficult to use your Assessment Center to calm the Uh Oh Center or to stop the Habit Center from engaging in a behavior that is unhelpful to you. Instead, you respond to the deceptive brain messages because you perceive that these sensations are a part of you, who you are. Your Uh Oh Center's alarm goes off and your Habit Center acts in its usual, unhealthy automatic ways.

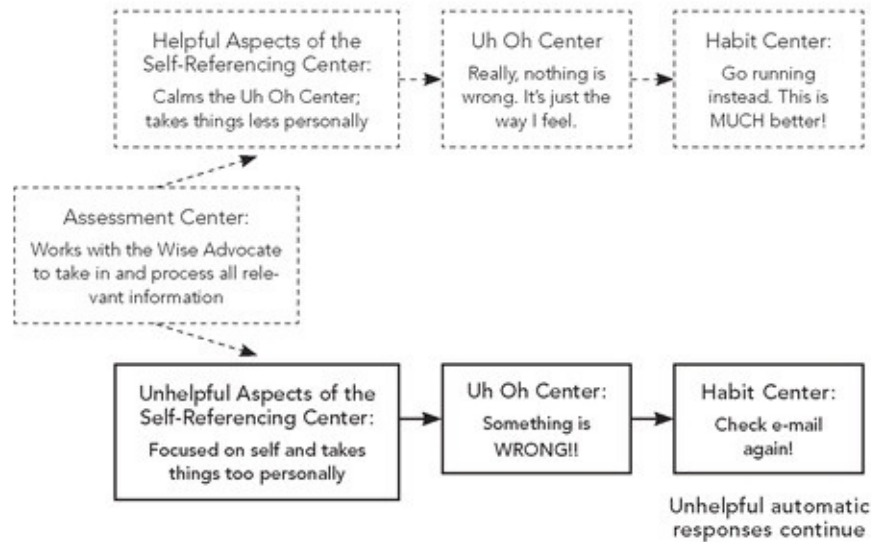


Figure 5.2. Unhelpful Aspects of the Self-Referencing Center in Charge

Figure 5.2 demonstrates how the unhelpful aspects of the Self-Referencing Center can drive the Uh Oh Center and Habit Center to perform unhealthy actions in an *automatic* way when the Assessment Center is quiet. In John's case, the deceptive brain messages made him constantly check his e-mail. Once his Habit Center responded in this way, the brain circuit supporting these deceptive brain messages, sensations, and habitual responses strengthened and checking e-mail whenever he thought Alicia was leaving became his brain's preferred, automatic response.

As figure 5.2 indicates, as long as you rely on the automatic responses coming from your Self-Referencing and Habit centers, this cycle will repeat over and over, resulting in the same unhealthy behaviors. Worst of all, because of underlying principles governing the brain that you learned about in chapter 3 (i.e., Hebb's law and the quantum Zeno effect), repeating the behaviors causes the circuits associated with those deceptive brain messages to get stronger and stronger. This is why it is so hard to break a habit once it gains a foothold in your brain.

How can you overcome this problem? Let's return to John and find out what he did.

THE FOUR STEPS

Step 1: Relabel—Identify your deceptive brain messages and the uncomfortable sensations; call them what they really are.

Step 2: Reframe—Change your perception of the importance of the deceptive brain messages; say why these thoughts, urges, and impulses keep bothering you: They are *false brain messages* (It's not ME, it's just my BRAIN!).

Step 3: Refocus—Direct your attention toward an activity or mental process that is wholesome and productive—even while the false and deceptive urges, thoughts, impulses, and sensations are still present and bothering you.

Step 4: Revalue—Clearly see the thoughts, urges, and impulses for what they are, simply sensations caused by deceptive brain messages that are not true and that have little to no value (they are something to dismiss, not focus on).

Not Taking Your Deceptive Brain Messages at Face Value

Although John was not aware of the processes occurring inside his brain, he knew he was miserable, felt powerless, and wanted to find a solution. He was often in a state of fear and was spending most of his time thinking about and taking care of Alicia, even though she did not want him doing this. He never spent time or energy on himself and led a very unbalanced life. John's problem, as you now know, is that he had no idea how to engage his Wise Advocate to recruit his Assessment Center so that it could make decisions that were in his overall best interest.

Then, as luck would have it, John was introduced to the Four Steps. He learned how to identify his deceptive brain messages (Step 1: Relabel) and became more curious about and open to whatever thoughts passed through his head. By becoming more aware, John was able to be increasingly attentive to the thoughts and began to notice the deceptive brain messages when they emerged. With time, he could see the links between the negative messages telling him Alicia was about to leave, the distress these thoughts caused, and his response of

constantly checking e-mail as a way to reassure himself.

As he continued using the Four Steps, he began to change his relationship with the deceptive brain messages and was able to see these false messages for what they were—“useless chatter, not reality” (Step 2: Reframe). When those uncomfortable feelings would emerge and instigate an urge to check his e-mail, John would remind himself that these physical and mental sensations were the result of deceptive brain messages and were not a reflection of his true self, reality, or the kind of relationship he wanted to have with Alicia.

How did he accomplish this? John’s ability to step outside what his deceptive brain messages were telling him and believe in himself so that he could make better decisions was due to believing ever more strongly in his Wise Advocate. You can think of the Wise Advocate as an inner guide and friend that you can use to help determine which information to pay attention to and which information to disregard—especially when doubt or other strong sensations are overwhelming you. In many ways, the Wise Advocate is supported by the Assessment Center. Indeed, you can think of the Assessment Center as the Wise Advocate’s executive arm. The major difference between them is that the Assessment Center is a physical brain region that processes information, whereas the Wise Advocate is a cognitive construct and mental aide to help you determine what information is truly relevant and important. In these ways, the Wise Advocate and Assessment Center support decision-making processes by first ensuring that all possible explanations are considered and erroneous messages are discarded.

What happened in John’s brain when he used his Wise Advocate? John started recruiting his Assessment Center and quieting the unhelpful aspects of his Self-Referencing Center, the area that was generating all the “useless chatter” and was so strongly linked to his Uh Oh and Habit centers. As the Assessment Center lessens the Uh Oh Center’s alarm system, the activity in the unhelpful aspects of the Self-Referencing Center and Uh Oh Center decrease. This means that John does not take things so personally. As this happens, the Habit Center’s automatic response to engage in an unhealthy behavior is partially blocked. The result is that the brain circuit supporting those automatic responses is weakened and John is more frequently able to veto the urge to check his e-mail.

Overcoming Your Deceptive Brain Messages: Making Choices

and Rewiring Your Brain

At the beginning, John's Wise Advocate was weak and not fully formed. After all, John had been paying attention to the content of his deceptive brain messages and the false alarm coming from his Uh Oh Center for years. It was only when he became adept at recognizing the deceptive brain messages and learned how to pay less attention to the Uh Oh Center when it set off that false alarm that things began to change. Although it was difficult, John learned not to fight the uncomfortable sensations and he did not try to make them go away. Instead, he let those sensations exist, paying as little attention to them as possible, while he continued with his day.

His final breakthrough occurred when he realized that checking e-mail often fueled the thoughts and escalated his behaviors, rather than decreasing them. With this insight, he finally understood why Step 3: Refocus emphasizes engaging in another behavior that *requires you to focus your attention* while the uncomfortable sensations are present. He could not do anything about the fact that the anxiety was there, but he could choose how he responded by not giving in. That's when he made a commitment to quit engaging in these behaviors altogether. He replaced those unhealthy habits with constructive actions, such as meditating, taking walks, and focusing on things that were important to him. As he learned to focus his attention in new, healthy ways, his brain rewired accordingly. He was able to focus on his work or spending time with Alicia, rather than worrying about what her intentions were. In short, he wired new healthy responses into his Habit Center.

Now, John's brain responds more like what is shown in figure 5.3 on page 94.

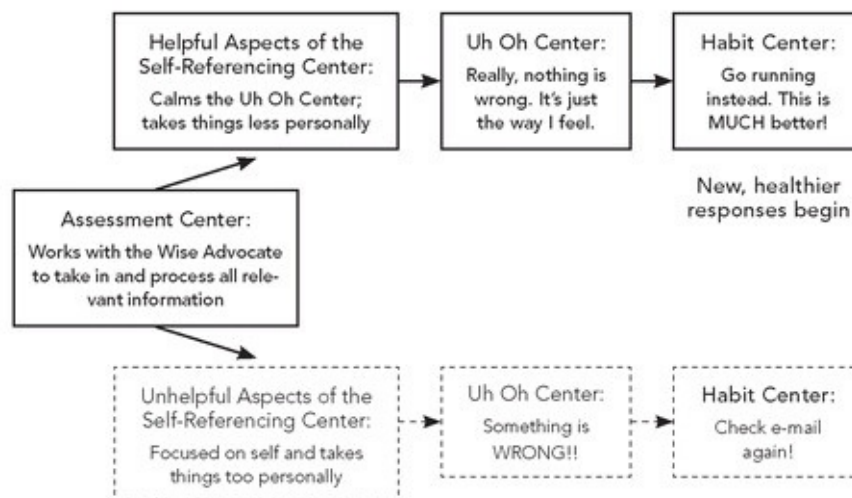


Figure 5.3. Wise Advocate Strengthened and in Control

As shown in the figure, the Assessment Center is now ordering new healthy behavioral responses—based on decisions made by the mind with the help of the Wise Advocate. The unhelpful aspects of the Self-Referencing Center and the Uh Oh Center have quieted down, which means the frequency and intensity of the alarms coming from the Uh Oh Center have decreased.

John's commitment to himself paid off. Now, whenever that old message comes along telling him that Alicia is leaving and that he must check his e-mail immediately, with Step 4: Revalue, John rapidly identifies it as nothing but a deceptive brain message, and he moves on. As he explains, once he is able to see what's happening, he uses Step 4 to remind himself that he does not have to let the deceptive brain messages "run my life or take over anymore." So now even if he has an uncomfortable feeling or urge to act on a deceptive brain message, John uses his mind to direct his attention elsewhere and deflate the importance of the nagging thoughts and urges. With the help of his Wise Advocate and the Assessment Center, John's mind is in charge, not his brain. He has begun to act in ways that make his Habit Center work *for* him, not *against* him.

Self-Directed Neuroplasticity: A Basis for Hope and Motivation

John's triumph over his deceptive brain messages is amazing because it actually

rewired his brain in the process. By choosing different responses and learning how not to take his deceptive brain messages at face value, John utilized *Self-Directed Neuroplasticity*, just as Connie did, to heal himself.

How can you apply Self-Directed Neuroplasticity to your situation? Let's review what you have learned about the brain and identify what approaches work from a biological perspective.

The goal of Self-Directed Neuroplasticity is to weaken brain circuits associated with unhealthy habits and strengthen those that support healthy actions. To lead a healthier life and weaken those unhealthy brain circuits, you need to break the cycle Kara described in chapter 1 and that hopefully you now easily recognize:

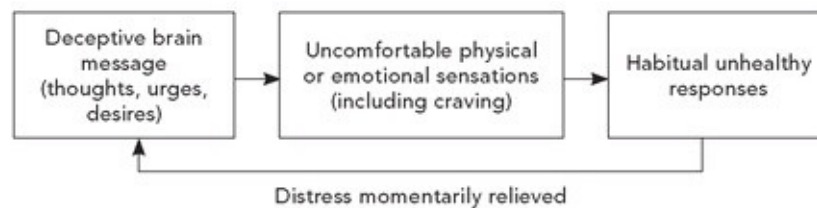


Figure 5.4. Cycle of Deceptive Brain Messages

Of course, you could attempt to break the chain anywhere along the line—at the level of deceptive brain messages or uncomfortable sensations or behaviors. However, as you have already learned, it is virtually impossible to stop your thoughts from coming or not experience a physical or emotional sensation once they arise because your brain is generating them. In fact, one of the central tenets of our Four Step program is this: *You should not try to stop the thoughts or sensations from arising—instead you should learn how to work around them.*

How do you work around the thoughts and sensations? By concentrating on the one thing you have the most control over: your actions and your ability to focus your attention on things that matter to you. As you have seen, paying attention to or responding to the deceptive brain messages makes them occur more frequently and results in your experiencing more intense physical and emotional sensations. If instead of responding to the negative messages you learn how to dismiss and not act on them, as John did, you will weaken the strength of those brain circuits and build healthier circuits in their place. That is the goal of the Four Steps—to teach you how to disregard the erroneous messages coming from your brain and instead *focus your attention on things that are genuinely important to you.*

Easier said than done—we know that from a vast amount of real-life experience with people who have successfully worked to conquer their own “bad

brains.” When the deceptive brain messages and sensations are strong, as they usually are at the beginning of using the Four Steps, it is extremely difficult to change the meaning and significance of these messages. That’s why focusing your attention on adaptive alternative behaviors, and not the messages or sensations, is so important.

The Four Steps and Emerging Research

John succeeded because he was able to use the Four Steps to become aware of his deceptive brain messages and consistently change his behaviors. John healed himself using the Four Steps and so will you. In this way, John’s story is yours and his journey is the same one you will be embarking on.

Let’s review the keys to John’s success:

- He used awareness (mindfulness) to *identify* (Step 1: Relabel) and *reevaluate* (Step 2: Reframe) the content of his deceptive brain messages as “useless chatter.”
- He chose to stop engaging in unhelpful behaviors that were hurting him and replaced them with healthy ones (Step 3: Refocus).
- He learned to *focus his attention away* from the erroneous content of his deceptive brain messages (Step 3: Refocus) and deflate their meaning (Step 4: Revalue).

Most important, John did all of this while experiencing significant distress: At first and for quite awhile, his Uh Oh Center was wildly firing, trying to tell him something was terribly wrong. That is, until he was able to use his Wise Advocate to reliably recruit his Assessment Center and diminish the importance he placed on the Uh Oh Center’s alarm and its corresponding unsettling sensations. His perseverance and commitment to change worked. With time, his deceptive brain messages decreased in intensity and frequency because he had weakened the brain circuits associated with them and had learned how to see the deceptive brain messages as a nuisance, rather than a harbinger of the truth.

Let’s review what John learned:

WHAT DOESN’T WORK