

Praying through Anxiety

Lesson 1: Anxiety and the Brain

Vocabulary:

to beat (as in heartbeat)	to resolve (adj., resolved)	to labor	to be ruled by
to clinch	occasionally	to strive	self-identity
discomfort	to explode	to commit	conflict
to react	complicated	to reject	moral
stuck	region	supernatural	to activate (n. activation)
to process (n. process)	to shut down	to meditate	to balance
to analyze	strategy	standard	to impact
reasoning (v. to reason)	to recall (adj., recalled)	effectively	chemical
long-term memory	to qualify (adj., qualified)	to defend	mental capacity
automatic	to retrain	to equip	development
to deal with	to deserve	to recite	interaction
to hack (adj., hacked)	acceptance	logical	to draw near to

Discussion:

Anxiety is a normal, but uncomfortable emotion. When we feel anxious, we might notice our heart **beating** faster, our muscles tightening, or our teeth **clenching**. We may begin to breathe faster, and some of us may even stop breathing. Our minds can become confused, thinking becomes difficult, and perhaps we can't even speak. At night, we cannot stop our thoughts, and then we can't sleep. We may get angry, or our voice gets louder. Sometimes our bodies respond so quickly to these anxious thoughts, we don't have time to change our reaction. We feel a sudden **discomfort** that we cannot seem to overcome by ourselves.

How do you know when you are feeling anxious?

Although we might experience anxiety for medical reasons, oftentimes we feel anxious because negative thoughts, worry, or fear come into our minds. We may be **reacting** to real danger, or our minds imagine danger. We may feel anxious when someone is rude or angry toward us, or they are causing a problem in our lives. We have too many things to do, we fear that we cannot do everything by a certain deadline. We may be reacting to something in our present life or a memory from the past. Perhaps we are anxious about something in the future, and we fear what will or might happen. Our thoughts become a problem when we can't get them out of our mind. We're **stuck**. We try to think positively, think of something else, get busy doing something, but the negative, uncomfortable thoughts just come back.

Are there any thoughts; memories; present, past, or future situations; or people that cause you to feel anxious?

How often do you feel anxious? Always, often, sometimes, or rarely?

This study series *Praying through Anxiety* explores how the Bible gives us direction on how to handle our anxious thoughts and discusses how the scientific study of cognition [cog-NIH-shun] confirms that what God says is true and helpful in his Word. In a simple definition, *cognition* is how the mind thinks. Cognitive [COG-nih-tihv] neuroscience [NUR-o-sy-ents] is the study of cognition and explores how the brain receives, understands, learns, **processes**, and **analyzes** information¹ and can be studied to understand better how people learn and behave. Did you know that your brain can *learn* how to be anxious? Every day, we receive information into our minds through our eyes, ears, or other parts of our bodies. We see, hear, or experience something, and our mind begins to think about what we should do with that information. This is called **reasoning**. Different parts of the brain are involved in the reasoning **process** and work together on how to react or respond to information.

Once this response to information is complete in our minds, we store the information, as well as our reasoning process, response, and behavior in our **long-term memory**.² When new information comes in, our mind will refer to old memories to help us consider how we should respond to this new information. In other words, we have taught ourselves how to respond, and our minds remember that response. In fact, this process can become so quick, that our responses over time become **automatic**.³ When this happens, our mind no longer depends on reasoning to process the information because it has already learned how to respond and behave. This is wonderful when we are learning skills in life, but a challenge when we're dealing with anxiety.

Have you ever noticed a sudden, automatic, and overly anxious response to a situation or person? Discuss.

You might have experienced this type of anxiety in a classroom. The teacher calls on you for an answer. Even though you studied, you get nervous and forget everything you learned. Maybe your computer was **hacked**, and even though the situation is **resolved**, you feel fear every time you log into your email. Perhaps you have a bad memory or negative feeling about a situation that comes to your mind. All you feel is anger, hurt, pain, or anxiety, and you can't figure out how to feel differently. What's worse is that you can't seem to get the memory out of your mind! Maybe you think about this memory every day or **occasionally**. But every time you think about it, you feel bad inside, and the feeling never seems to change. You might even seem angry when you feel anxious. When you feel anxious, suddenly your anger **explodes**, and you have no idea why. Whatever the reaction, your mind has learned this response, and that response is stuck in your memory.

Have you ever felt so anxious you couldn't speak? Do you have a constant fear of something? Do you have a bad memory that just won't go away? Do you experience sudden anger when you are anxious? Explain.

¹ J.L. McClelland, "Cognitive Neuroscience" in International Encyclopedia of the Social & Behavioral Sciences, 2001, accessed June 26, 2022, <https://www.sciencedirect.com/topics/psychology/cognitive-neuroscience>.

² Georg Deutsh and Sally Springer. *Left Brain-Right Brain: Perspectives from Cognitive Neuroscience*. New York: W.H. Freeman and Company Worth Publishers, 1998, 204-10.

³ This concept of automaticity is discussed in the process of learning and reading in the following: Robert Sternberg and Jean Pretz. Ed. *Cognition and Intelligence: Identifying the Mechanisms of the Mind*. Cambridge UK: Cambridge University Press, 2005, 307-12. National Reading Panel (NRP). *Report of the National Reading Panel: Teaching Children to Read*. National Institute for Literacy, 2000, 3-7, 24.

What makes anxiety **complicated** is that during this uncomfortable, confusing experience, the **region** of the brain you need to use to change how you think and respond, also called your reasoning center, can **shut down**.⁴ With no way **to reason** through your feelings or stress at that moment, is there hope? Praise God there is! Over time, many people can use **strategies** that can calm the mind, train the brain to process the information in a new way, and then store that new information in a way that it can be **recalled** easily when we need it in the future.

While scientists have discovered amazing facts about how the brain works, no one is more **qualified** to help us with training our brains than the one who created us: God. In fact, if we know a little about the brain, we can often **retrain** our minds simply by using the Bible and prayer. Written between 1900 and 3500 years ago, long before neuroscience was developed, the Bible provides us not only with instructions on how to rest, think, and react, but also with God's truths that are important to remember when retraining our minds. Paul discusses the importance of this process when he writes a letter to his son in the faith, Timothy:

...train yourself to be godly. ⁸ For physical training is of some value, but godliness has value for all things, [with promises] for both the present life and the life to come. ⁹ This is a trustworthy saying that **deserves** full **acceptance**. ¹⁰ That is why we **labor** and **strive**, because we have put our hope in the living God, who is the Savior of all people, and especially of those who believe. (1 Timothy 4:8-10, NIV)

What does Paul say about training ourselves to think and respond in a way that pleases God?

One of the first things we learn from Paul is that training our minds and behavior *is possible* in Christ. That's good news! He then points us to scripture for that training, so we don't have to be brain scientists. That's great news! He even tells us to **commit** ourselves fully to this process. For if we do this, the Lord promises that we will see his goodness in this life and in the next. Is this process easy? No! It wasn't easy for Paul. Even though Paul was a Christian and leader among the churches, he had to labor and strive to practice this process in his life. Why? He did this because he believed that Jesus not only gave us the way to be saved but also the way to live faithful and fruitful lives, even with the mind that he created for us.

You might be thinking, why do I need to use the Bible and pray? Why can't I just *think* my way into change? Paul addresses this question in his letter to Timothy when he says this:

⁴ For everything created by God is good, and nothing is to be **rejected** if it is received with thanksgiving, ⁵ for it is made holy by the word of God and prayer. (1 Timothy 4:4-5, ESV)

According to this verse, why might we want to depend on God's Word and prayer to help heal our minds?

⁴ Patricia Alexander and Philip Winne. Ed. *Handbook of Educational Psychology*. Division 15 of the American Psychological Association. Mahwah: Lawrence Erlbaum Associates, Inc., Publishers, 2006, 333-77; Usha Goswami. "Neuroscience and Education." Mar. 2004. *British Journal of Educational Psychology* 74.10. 30 June 2008, <http://web.ebscohost.com>, 10.

According to Paul, since God created our minds, we are made holy in God's sight through his Word that came through Jesus Christ and through prayer. God's blessing for his creation *depends* on his Word and on prayer. When we seek healing for the body he created for us, using the holy tools he has given us, there is a **supernatural** blessing at work from God to heal us beyond what we can do by ourselves. This is a promise from God!

But are there any scientific reasons for using God's Word and prayer for healing our minds? Actually, there are many! Harvard University reviewed over 1100 studies on religion and the brain and selected twenty-five studies that they believe provide us with the most reliable information.⁵ Several of these studies revealed that praying, as well as reading, studying, and **meditating** on God's Word increases activity in parts of the brain that can help us to overcome anxiety. Scientists discovered that people who have a set of healthy beliefs and **standards** by which they live can more **effectively** process stressful situations and **defend** themselves from wrong thinking.⁶ From this study, we learn that the more we know and recall the truths found in the Bible, the more **equipped** we are to deal in a healthy way with situations that cause anxiety. One study also showed that **reciting** scriptures helps to develop the area of the mind responsible for planning, setting goals, focusing, and evaluating our thoughts and behavior.⁷ In other words, when we feel anxious, reciting scriptures that relate to our situation can help direct us to a more **logical** plan of action, rather than one **ruled by** our feelings. Another study showed that evaluating the truths of the scriptures increased areas of the brain responsible for managing emotions, **self-identity**, and resolving **conflicts** inside our minds.⁸ When questions about **moral** issues come into our minds, Christians who have based their moral standards on God's Word use more areas of the brain for processing this information than those who do not believe in God.⁹ As Christians evaluate themselves, through such standards as the Bible, they actually **activate** areas of the brain that are responsible for **balancing** negative emotions, including anxiety.¹⁰

Why is meditating on scriptures and considering how scriptures apply to our lives helpful for anxiety?

How do you read the Bible? Do you simply read passages, or do you take time to consider how the scriptures speak to your situation, to your thinking, or even to your behavior? Explain.

What **impact** does prayer have on the brain? Scientists found that prayer activates the area of the brain that produces a **chemical** called dopamine [DOH-puh-meen]. Dopamine helps us to feel motivated to

⁵ James I. Rim, Jesse Caleb Ojeda, Connie Svob, Jürgen Kayser, Elisa Drews, Youkyung Kim, Craig E. Tenke, Jamie Skipper, and Myrna M. Weissman. Current Understanding of Religion, Spirituality, and Their Neurobiological Correlates. *Harv Rev Psychiatry*. Author manuscript; available in PMC 2020 May 2. *Published in final edited form as:* Harv Rev Psychiatry. 2019 Sep-Oct; 27(5): 303–316. doi: 10.1097/HRP.0000000000000232.

⁶ Inzlicht M, McGregor I, Hirsh JB, Nash K. Neural markers of religious conviction. *Psychol Sci* 2009; 20:385–92.

⁷ Azari NP, Nickel J, Wunderlich G, et al. Neural correlates of religious experience. *Eur J Neurosci* 2001; 13:1649–52. For explanation of the frontal-parietal circuit and executive function, see E. Mezzacappa, *Executive Function*, in Encyclopedia of Adolescence, 2011, <https://www.sciencedirect.com/topics/psychology/fronto-parietal-network>.

⁸ Harris S, Kaplan JT, Curiel A, Bookheimer SY, Iacoboni M, Cohen MS. The neural correlates of religious and nonreligious belief. *PLoS One* 2009; 4:e0007272.

⁹ Christensen JF, Flexas A, de Miguel P, Cela-Conde CJ, Munar E. Roman Catholic beliefs produce characteristic neural responses to moral dilemmas. *Soc Cogn Affect Neurosci* 2014; 9:240–9.

¹⁰ This discovery was contrasted with Tibetan monks who did not experience this because of their lack of self-examination and the ignoring of "self." See Wu Y, Wang C, He X, Mao L, Zhang L. Religious beliefs influence neural substrates of self-reflection in Tibetans. *Soc Cogn Affect Neurosci* 2010; 5:324–31.

learn and to recall information¹¹ and is an important chemical for managing anxiety.¹² People who pray regularly and often also have a greater **mental capacity** for processing new information or managing, organizing, and analyzing a greater amount of information at the same time.¹³ One study showed that the more powerful the prayer experience, the greater the **activation** of multiple regions of the brain. As these regions work together, the experience creates a positive impact on the mind's **development**.¹⁴ This type of mental exercise helps to develop paths between different regions of the brain, which can lead to higher reasoning skills and cognitive abilities.¹⁵ While reciting pre-written prayers can also be a healthy experience, scientists discovered that prayers that are produced through the mind activate more areas of the brain responsible for social-emotional processing, positive behavior, and healthier social **interactions**.¹⁶ Some scientists even discovered that people who experience trust, honesty, and closeness with God have a greater ability to control the mind over people who experience fear when thinking about God.¹⁷ In all this, we can see that knowing the Word of God and **drawing near to** him through prayer can have powerful effects over anxiety. In the next few lessons, we will discuss strategies developed through prayer and scripture that you can begin using to help train your brain to think differently.

Describe your prayer life. Do you pray regularly and often? Do you usually read your prayers, pray from your mind, or do both? Do you experience trust, honesty, and closeness to God when you pray? Or do you usually feel more fear?

Have you ever had a powerful prayer experience? If yes, describe.

This Week:

Write in your journal:

1. Take some time this week reading the book of Philippians. Write what you learn and any scriptures that encourage you. Write these verses on cards and read them during the day.
2. Find a Psalm that encourages you, and begin your time of prayer by reading this Psalm. From there, begin to pray from your own mind. Talk with Jesus about your closeness, honesty, and trust in him. Pray about how you can grow in this area. Ask him to remove any spirit of fear of him in your heart.

¹¹ Schjoedt U, Stødkilde-Jørgensen H, Geertz AW, Roepstorff A. Rewarding prayers. *Neurosci Lett* 2008;443:165–8. For more information on the role of dopamine, see Oscar Arias-Carrión, Maria Stamelou, Eric Murillo-Rodríguez, Manuel Menéndez-González, and Ernst Pöppel, Dopaminergic reward system: a short integrative review, *Int Arch Med*. 2010; 3: 24. 2010 Oct 6. doi: 10.1186/1755-7682-3-24

¹² For the role of dopamine and anxiety, see Mohammad-Reza Zarrindast 1, Fatemeh Khakpai, The Modulatory Role of Dopamine in Anxiety-like Behavior, *Arch Iran Med*. 2015 Sep; 18(9):591-603.

¹³ Kober SE, Witte M, Ninaus M, et al. Ability to gain control over one's own brain activity and its relation to spiritual practice: a multimodal imaging study. *Front Hum Neurosci* 2017;11:271. For the role of theta/beta ratio, see Adam R Clarke, Robert J Barry, Diana Karamacoska, Stuart J Johnstone, The EEG Theta/Beta Ratio: A marker of Arousal or Cognitive Processing Capacity?, *Appl Psychophysiol Biofeedback*. 2019 Jun;44(2):123-129. doi: 10.1007/s10484-018-09428-6.

¹⁴ Beauregard M, Paquette V. Neural correlates of a mystical experience in Carmelite nuns. *Neurosci Lett* 2006; 405:186–90.

¹⁵ Sternberg and Pretz, 96.

¹⁶ Schjoedt U, Stødkilde-Jørgensen H, Geertz AW, Roepstorff A. Highly religious participants recruit areas of social cognition in personal prayer. *Soc Cogn Affect Neurosci* 2009;4:199–207.

¹⁷ Kapogiannis D, Barbey AK, Su M, Krueger F, Grafman J. Neuroanatomical variability of religiosity. *PLoS One* 2009;4:e7180; and Miller L, Bansal R, Wickramaratne P, et al. Neuroanatomical correlates of religiosity and spirituality: a study in adults at high and low familial risk for depression. *JAMA Psychiatry* 2014;71: 128–35.