



The Atonement of Christ is meant for the growing experience of adolescence.

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The Adolescent Brain and the Atonement: Meant for Each Other, Part 1: The Dilemma

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Abstract

Adolescence is a challenging developmental period in consequence of both internal (endogenous) development and external (exogenous) conditions that influence teens' emotional experience, cognitive processing, and attendant behavior. The adolescent brain has not yet fully developed or matured, resulting in significant and specific developmental limitations. This brain, not yet fully developed, collides head-on with sexual maturation, also occurring during the teen years, further complicating adolescent behavior. Additionally, spiritual awakening is common during adolescence as cognitive development fully enables grappling with life's existential questions. Spiritual awakening, too, collides with the teen brain and sexual drive. These internal developments are complicated by two external conditions—a sexually saturated environment and potentially shaming parental responses to adolescent shortcomings. In this first paper, we document these developmental challenges and external conditions and offer a portrait of acute emotional, mental, behavioral, and spiritual vulnerabilities accompanying adolescence.

In a companion article in the next issue, we consider how the Atonement is perfectly fit to adolescents' spiritual needs attending their developmental experiences and these environmental conditions.

Keywords

Adolescence; development; brain development; puberty; sexual drive; spiritual awakening; emotional, cognitive, and behavioral complications and limitations; developmental patience

The Dilemma

The tabernacle of our immortal spirit is a mortal body, subject to all manner of weakness and infirmity. We labor in the spirit to give expression to our divine nature *through* our physical body. This is a developmental journey.

Adolescence is often a period of especially heightened vulnerability as a consequence of potential disjunctions between developing brain, behavioral and cognitive systems that mature along different timetables and under the control of both common and independent biological processes. Taken together, these developments reinforce the emerging understanding of adolescence as a critical or sensitive period for a reorganization of regulatory systems, a reorganization that is fraught with both risks and opportunities.¹

Just as an infant is not instantly adult and must grow even into the physical capacities to see and move and think, so adolescence is a period where we are still growing into adult emotional, cognitive, and behavioral potential. If we lack, or forget, developmental perspective and patience, "growing up" can be fraught with frustration.

His retreat developed gradually. At first, Caleb² simply sought out a secluded area of the chapel where he hoped he wouldn't be seen.³ After a while, he began sitting in the foyer until the sacrament was over. Then one day he didn't come in at all. His father got up and left the chapel in search of his son. He found him behind the acoustic curtain, on the stage, where no one could hear him. He was on his knees, bent over to the floor, sobbing. Despite the centrality of spiritual things in his life, Caleb felt isolated and alienated, putting him at risk for emotional, psychological, and spiritual *dis-integration*, an "unraveling" of his life.

Like many Latter-day Saint youth, Caleb was spiritually sincere and wanted to be faithful and true in all his actions. But he was growing up in a society saturated with evil enticements that play directly to human weakness

and prey upon adolescent vulnerabilities. Caleb was exposed to pornography—in today's saturated environment, exposure is nearly inevitable. Like so many of our youth, Caleb was at first repulsed by what he saw. Yet, over the following days and weeks, a curiosity developed and drew him back to sexually arousing material. In spite of his spiritual desires, Caleb yielded to a physical enticement he didn't fully understand. It wasn't long before Caleb discovered the powerful experience of arousal. Each successive experience dulled spiritual sensitivity and intensified other, powerful physical feelings and thoughts. Before long, Caleb had developed a habit of pornography viewing and masturbation.

Nevertheless, Caleb's spiritual awakening and desires were equally real for him. Nothing changed in terms of Caleb's spiritual goals—mission, marriage, family. His whole life, Caleb had been taught right from wrong. Consequently, he felt terrible about this problem and was dragged down by feelings of guilt and shame. Caleb began wondering, then doubting, if he could or would change.

Unlike too many youth, Caleb had shared his struggle with his parents, with whom he had a close, loving relationship. That Sunday on the stage at church, Caleb's father knelt beside him, wrapped his arms around him, and just held him. What Caleb most needed right now, his father sensed, was love.

Still, despite Caleb's best efforts, he was unable to get the better of his passion. For some, the season of repentance is brief, while for others it may be years, notwithstanding their spiritual sincerity and striving. Nephi and Paul voiced similar anguish and would certainly feel compassionate understanding for Caleb's trial (see 2 Nephi 4:16–35; Romans 7:10–25). Young men like Caleb are vulnerable to first isolating *themselves* and then quickly coming to feel alienated *from* the fellowship of the Saints and estranged from Christ's Church. Already despondent and downtrodden, spiritually sincere teens' vulnerability is magnified when they separate themselves from protective influences and allies. Satan exploits this opportunity.

Caleb's story is one that is all too common among spiritually sincere, striving youth. In fact, this experience of a spiritually sincere, striving youth "hitting the wall" of mortal weakness and limitations is so common that we even find it in the scriptures. For example, we find comparable experiences in the narrative accounts of Nephi, Paul, Enos, Alma the Younger, and, in the latter days, Joseph Smith. And in their narratives we will also find the resolution of their spiritual struggle and answers for our teens. First, though, we

need to better understand the developmental circumstances of all young men and young women.

Caleb is our concern. We need to understand him and then use that understanding to help him. How did Caleb get to that stage? Why is he bowed down, sobbing, and full of despair in spite of the goodness of his heart? How many other young men and young women are similarly lost to our view? To more fully comprehend Caleb's experience, we need to grasp the developmental reality and experience of adolescence—the not yet fully mature brain, juxtaposed with the onset of sexual maturity and drive, colliding with spiritual awakening, all occurring in today's uniquely challenging environment. After we better understand the adolescent experience, we will turn our attention to the task of providing comfort, assurance, and strength through the doctrine and witness of the Atonement. The Atonement of Christ is meant for the growing experience of adolescence. The plan for our happiness now and in the eternities is anchored in the Atonement. The purpose of this article and the companion papers is to assist parents and leaders in conveying to their teens how Christ's Atonement and God's redeeming love are perfectly "fit" to teens' developmental challenges. Always, the goal is repentance, for only righteousness brings peace as well as joy.

In this series of articles, part of the *Spiritual Exodus*⁴ project, our four learning objectives are (1) understand the vulnerabilities of the adolescent brain and body; (2) understand the spiritual awakening of adolescence and how it comes into contact with the adolescent brain—often as a stumbling block;⁵ (3) gain an appreciation of the Atonement's perfect fit to these developmental realities of adolescence (in "Part 2: The Rescue"); and (4) understand how to interact with teens around impulsive, including potentially addictive, behaviors (in "Part 3: Works Meet for Repentance").

Development on a Collision Course

How Caleb got to that stage is our first question. Of course, the immediate answer is the sin, but there is deeper understanding to be gained. Mortality is a period of opposition, testing, experience, and growth. The adolescent years are a peak period of development—physically, mentally, emotionally, socially, and spiritually—and some of the forces bearing down on our teens are set on a collision course. In contemplating how Caleb got there, we focus on three internal developmental events and two external conditions that, for many, collide disastrously during adolescence (see figure 1). In a companion paper,

we consider how an underdeveloped comprehension of the Atonement and its proper application to our mortal weaknesses can turn spiritual awakening toward deep spiritual anguish, and, potentially, spiritual alienation. We encourage parents and leaders to emphasize instruction and testimony con-

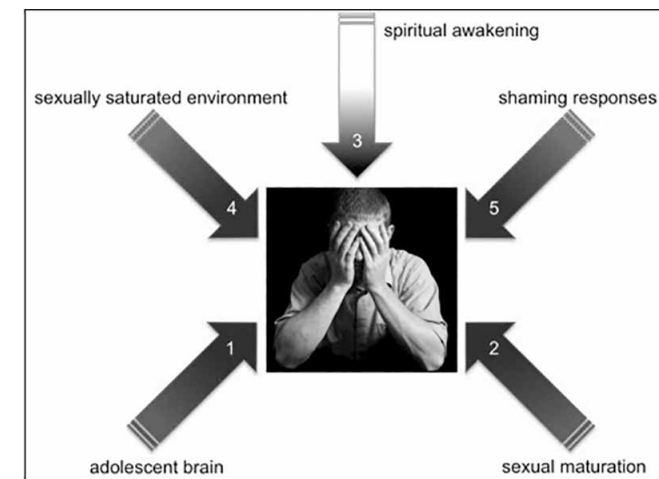


Figure 1. Internal (endogenous) forces and external (exogenous) pressures bearing down on adolescents.

cerning the Atonement because of how it can help struggling teens weather these difficult experiences.

The adolescent brain—developmentally limited

Life is a developmental experience, and parents and leaders need to have developmental understanding and developmental patience for what is, after all, a stepping-stone journey (see 2 Nephi 2:111; Alma 12:24; Alma 42:10). Just as parents need to understand infant development so that they can have developmentally appropriate expectations and responses, it is equally critical to understand development during adolescence and the unique limitations and challenges that occur as a result of teens' still incomplete development. New knowledge about adolescent brain development has led to a different portrait of psychological development with significant implications for how we relate to teens.⁷ Just as our bodies grow, so our brains grow too, and

with this growth will come increased capacity to overcome the natural man. However, the brain's immaturity during adolescence impairs decision-making and compromises behavior⁸ in ways that are critical for parents and leaders to understand if they are to set forth developmentally appropriate expectations, help teenagers wrestle with their weaknesses and in time overcome them, and be patient and compassionate along the way.

The Adolescent Brain—A Work in Progress

The human brain's crowning achievement is the frontal cortex. The frontal cortex is where our executive control over the other areas of the brain, our emotions, and our behavior develops.⁹ Anchored in rational thinking, executive control consists in part of reasoning, judgment, and planning that links past, present, and future experiences and goals. This thinking, in turn, can be used to generate appropriate action and inhibitory responses, including impulse control. The frontal cortex is where we gain regulatory control over our emotions, allowing us to choose our behavior in response to emotions rather than be triggered by emotions. We are able to direct behavior down healthy pathways—away from impulsive, unrestrained responses that emotions alone often produce.

In the mature brain, emotions, appetites, and passions, as well as pleasure and pain responses, are mediated and regulated through the frontal cortex and associated regions of the brain, giving us power both to action and to inhibitory responses as needed.¹⁰ Thus, in a very real sense, the development and strengthening of the frontal cortex represents the seat of moral discipline. The frontal cortex coordinates and unites emotion and reason into the uniquely human whole that defines us morally and spiritually as children of God.

Yet these important portions of the brain aren't fully online during adolescence or completely wired up with the rest of the brain.¹¹ As Steinburg notes, "the development of an integrated and consciously controlled [fully online] 'executive suite' of regulatory capacities is a lengthy process. Yet adolescents confront major, emotionally laden life dilemmas from a relatively early age,"¹² an age that has become increasingly younger over time.

Brain development continues throughout adolescence¹³ and into the mid-twenties.¹⁴ The brain, as well as the body, experiences a growth spurt right before puberty, particularly in the frontal cortex and associated regions of the brain. During the growth spurt, there is a thickening of the gray matter

in this front part of the brain.¹⁵ With that growth, all the gray matter is in place, but it isn't wired up yet or plugged in to the rest of the brain. Some researchers estimate that the teen brain is about 80 percent wired up¹⁶ and connected—each part of the brain with the rest—yet the very last portion of the brain to get wired up and plugged in to the rest of the brain is the frontal lobe.¹⁷ As parents of teens can attest, that last 20 percent apparently makes a huge difference!

The frontal cortex of the adolescent brain isn't at full capacity yet, nor has it achieved executive control.¹⁸ Consequently, the structures and connections necessary to fully capacitate adult-like behavior are not yet in place.¹⁹ Thus teens aren't completely online when it comes to reasoning, judgment, and planning, or managing their emotional experience,²⁰ all of which help comprise regulatory control. Limited engagement of the prefrontal cortex, where these executive functions reside, appears related to less impulse control (or *response inhibition*).²¹ To the extent the adolescent brain is not fully wired up, then, teens are likely to struggle to assert executive control.²² Until this brain development occurs, compared to adults, teens are likely to have diminished capacity for response inhibition or impulse control.²³

Experience and observation teach us that, from infancy through old age, our immortal spirits are constrained by our mortal tabernacles, including our brains. Among teens, the result is that early on the immortal spirit, which operates *through our mortal body and brain*,²⁴ is at a disadvantage working with an adolescent brain and inhabiting a teenage body. Just as infants are limited in function—even though the infant body houses an immortal intelligence and powerful spirit—so also adolescents experience real limitations in what they are capable of cognitively, emotionally, and behaviorally, resulting from brain and body development not yet realized. While brain development is in progress, behavior will most certainly be a work in progress!

During the teen years, the choices adolescents make wire up all this new brain matter.²⁵ Later on, growth is followed by pruning—or, in other words, unused connections are discarded.²⁶ Together, brain growth, wiring up, and pruning profoundly influence our behavior in an enduring way.²⁷ Therefore, when we speak about adolescence as the formative years, perhaps more than we previously realized, that is exactly what they are! The inherent risk is that because executive functions take relatively longer to fully develop, there is ample opportunity for "suboptimal trajectories" to develop.²⁸ Striving for correct choices is vital during adolescence because these choices will impact the

Adolescent Brain Limitations and Vulnerabilities In Judgment, Reasoning, And Behavioral Mastery

Poor Planning/Prognostication

- Absence of forward thinking
- Failure to perceive risk/perceived invulnerability

Poor Impulse Control/Self-Control

- Short time horizon for decision-making
- Underdeveloped capacity for delaying gratification
- More easily distractible from long-term goal-striving/moral ideals

Powerful/Compelling Experience of Emotion, Passion, Pleasure

- Emotional intensity, fervency
- Activated more by emotion than by reason
- (Which contribute to) impulsive behavior
- High arousal-seeking behavior

Extreme Thinking and Emotionally Skewed Experiencing

- Polarized, dichotomous thinking, in “black-and-white” extremes
- Overgeneralization or globalized thinking
- Emotional reasoning/emotionally biased processing of experience

(See Jensen & Kirwan, 2015; ACT for Youth Upstate Center of Excellence, 2002; L. Steinberg, 2005; Yurgelun-Todd, 2007)

Table 1. Adolescent Brain Vulnerabilities

brain and behavior in a lasting way.²⁹ Yet, to repeat, that striving is also hindered and limited by the adolescent brain.

The Teen Brain at Risk

What are the risks for teen thinking, emotional experience, and behavior in consequence of the adolescent brain? Limitations and attendant liabilities

of the adolescent brain can be organized into four categories: (a) poor planning/prognostication; (b) poor impulse control/self-control; (c) powerful, “compelling” experience of emotion, passion, and pleasure; and (d) extreme thinking and emotionally skewed experiencing (see Table 1).

Every parent and leader who has worked with youth has observed that, more than most adults, teens are prone to impulsive, poorly thought-out behavior³⁰—behavior that leaves adults scratching their heads and asking, “What were you thinking?” Understanding brain development helps us know that adolescents *don’t* think in the same way adults *become* capable of thinking. With reasoning, judgment, and forward thinking not fully online yet, teens manifest a short time horizon for decision making. Living in the moment, teens’ immediate impulses aren’t readily or persistently countered by consciousness of consequences down the road.

As we counsel with our youth in the home or as they study in Church settings, adolescents can readily follow adult reasoning and be entirely on board with it; they can be committed and fully intending to do the right thing. Indeed, adolescent fervor often produces a “we here highly resolve” type of determination. Thus parents and leaders assume that the matter is taken care of and are often incredulous (and frustrated) when, not much later at all, the entire plan they thought was in place seems to have been entirely forgotten! Judging from their behavior, it would seem that the adolescents had, indeed, forgotten. Yet, when parents ask, teens typically remember quite well their earlier resolve. Teens are as perplexed as their parents and unable to explain how they lost focus and got off track. They can’t make sense of it either. Hence they’re prone to severe self-blame for their “senseless” behavior. Some of the explanation for their behavior lies with the adolescent brain, which puts teen behavior at risk for impulsivity, risk taking, and sensation seeking with an absence of forethought or prior reflection.³¹ These risks combine to create a tendency toward immediate gratification.

In addition to differences in thinking, teens experience and process emotion differently than adults.³² The teen brain doesn’t process experience or produce behavior through reference to the “reasonable” parts of the brain. Experience is processed more in the emotional center of the brain than the reasoning center.³³ Functional Magnetic Resonance Imaging (fMRI) has shown that adults engage the frontal cortex—the seat of judgment and reasoning—in processing and responding to experience, while in teens the amygdala, an older portion of the brain associated with impulsive, instinctive responses,

lights up.³⁴ Teens' emotional experience is acute and their physical experience is potent—all of which contributes to impulsivity and a harder time resisting physical gratification. In time, we can learn to delay gratification, but during the teen years that capacity is underdeveloped. Delaying gratification is a struggle in part because the brain is still under construction. In consequence of these differences, teens struggle both with reining in their emotional experience as well as the behaviors that flood from their emotions and passions.³⁵ Cognitive, emotional, and behavioral systems of the brain develop "at different rates and under the control of both common and independent biological processes."³⁶ Thus, as one developmental neurobiologist put it, "adolescence is a heightened period of vulnerability specifically because of gaps between emotion, cognition and behavior."³⁷ These gaps have important implications for how we view teens' capacities and how we approach teen behavior. Additionally, research suggests that boys' brain maturation associated with increased cognitive abilities and impulse control lags about two years behind girls' maturation.³⁸ This lag is likely to be reflected in a more prolonged maturational struggle for boys.

With the frontal cortex and temporal lobes not entirely online or wired up yet,³⁹ the teen brain, left on its own, is set in motion by emotion and fails to think ahead or think back before it acts. Because executive functions are not fully developed during adolescence and the early young adult years, there is ample opportunity for "suboptimal trajectories" to develop.⁴⁰ The adolescent brain leaves teens vulnerable to being distracted from long-term goal striving and achievement of moral ideals when they are triggered by powerful emotions and physical urges that lead to impulsively engaging in high arousal-seeking behavior. Teens can be easily derailed by here-and-now impulses that, to everyone's astonishment, entirely override earlier intentions and undermine sincerely held future aspirations—all due in part to these limitations of the still-developing adolescent brain.

Teens' best intentions can thus seem like mere sandcastles of ambition that can be washed away by one wave or successive waves of emotional impulse. Parents can sometimes provide breakwaters against the tides and waves—setting up structures that provide some protection against impulse—but not always. Parents should not be dismayed that complete protection is impossible; ultimately, teens must create their own protection just as their parents have done.

While the work of self-mastery is under way, it is important for parents to remember that we weren't any different when we were young. We weren't "all put together." This repeated experience each generation is a developmental fact of life and brain development—in any generation, teens aren't yet completely capable of thinking or especially *behaving* like adults.

Now, what kinds of behaviors do we know that a lack of judgment and reasoning, a here-and-now mental horizon, a tendency toward instinctive and impulsive actions, and an experience of emotion, arousal, and pleasure that *feels* compelling and overwhelming make adolescents vulnerable to? If you answered, "passion, appetite, immediate rewards, and some recklessness," you're on track to identifying behaviors to which adolescents are developmentally susceptible. With that in mind, note that all of the carnal appetites offer immediate reward—the thrill, the rush, the pleasure, the intoxication, the escape—and thus prey upon the underdeveloped adolescent brain. The teen brain leaves adolescents exposed and vulnerable.⁴¹ It is no wonder that purveyors of all sorts of addictions market to adolescents.⁴² Immediate gratification and an escape from overwhelming experiences are hard for teens to resist. Separately and combined, these brain-based limitations make teens vulnerable to significant behavioral stumbling, including substance abuse, pornography viewing, and other behavioral problems and addictions.

So we see that part of Caleb's struggle is developmental—he's still growing, including his brain. Just as he needs to grow into an adult body, so also are *time*, *patience*, and *effort* required to grow into adult brain capacity. This includes adult capacity for forward thinking, reasoning, resolve, impulse control, and increasing ability to bridle emotions and subdue passions to the governance of higher will. As we approach Caleb now, wondering how to respond as we see him there on the stage, on his knees, trying to figure *himself* out—why he does the things he does and why it seems he "cannot change"—our developmental understanding of the adolescent brain helps us have compassion for him, and it helps us see ways we can help. We realize how confused and frustrated *he* feels, which is probably the first important thing for *us* to grasp.

Understanding the developmental realities of the adolescent brain does not mean we should let go of our standards or abandon our expectations, but it does invite compassion, patience without permissiveness, and taking the long view of life's developmental experience. The Atonement of Jesus Christ is formed and fitted to life's developmental journey, and nowhere is

it more needed than during these adolescent years. Parental comprehension of the Atonement is as important as adolescents' understanding of it. The Atonement of Jesus Christ was prepared for our lost and fallen condition here in mortality and for our developmental journey toward exaltation. Before we turn our attention to discussing the Atonement in more detail, though, there are additional elements of the adolescent experience to bring into our view.

The awakening of the natural man and physical desire—developmentally tested

Doctrinally, young children are not spiritually accountable until they reach the age of accountability, understood to be the age of eight. At age eight, we become spiritually accountable, and, with the onset of puberty a few years later, our own experience of the tendencies and temptations of “the natural man” begins in earnest. The onset of puberty marks the “coming of age” of the natural man as we experience the full formation and full force of our carnal nature. Perhaps most significant is the awakening of sexual interest and development of sexual drive that accompanies puberty.⁴⁴ Puberty occurs in early adolescence and “heightens emotional arousability, sensation-seeking, [and] reward orientation.”⁴⁵ Yet, as we now understand, this occurs at a time when the brain is still not fully developed and therefore not completely capable of taking on the struggle against the natural man. Regulatory competence only begins to develop in late adolescence⁴⁶ and into the young adult years. As Steinberg expresses, “Changes in arousal and motivation brought on by pubertal maturation precede the development of regulatory competence in a manner that creates a disjunction between the adolescent’s affective experience and his or her ability to regulate arousal and motivation.”⁴⁷ Thus, the adolescent brain encountering puberty is not yet completely capable of adult self-discipline and self-mastery, creating “a period of heightened vulnerability to problems in the regulation of affect and behavior.”⁴⁸ In the teen years, in consequence of the adolescent brain, reasoning and judgment, impulse control and self-control are works in progress, while puberty isn’t waiting around at all. Sexual maturation and drive don’t wait for a mature brain. Thus, the very capacities essential to successfully managing sexual drive are in limited supply at the very time sexual drive is nearing its peak.

We’ve all observed teenagers whose coordination hasn’t caught up with their fast-growing bodies. Just as adolescents are physically a bit uncoordinated—still figuring out how to get their full-size bodies to do what they

want—so also their brains are a bit uncoordinated and not yet skilled in handling the new and powerful impulses that come with puberty. Normative development is all about coordinating the cognitive, emotional, and behavioral structures of the brain.⁴⁹ Specifically, emotion and reason are often uncoordinated, clashing antagonistically rather than cooperating synergistically.⁵⁰ This clash results in inconsistent, unpredictable behavior that frustrates and confuses teens and adults alike.

Just as the brain has to catch up with the body’s dramatic physical development, almost relearning physical coordination, so also will the brain—for years—be playing catch-up with sexual maturation and sexual drive brought on by the hormonal flood of puberty. Just as physical growth is dramatic and outstrips physical coordination, so also sexual maturation occurs quickly and outpaces brain development—the brain won’t finally catch up until around age twenty-five!⁵¹ For years, brain development lags behind these other developments. Consequently, even though teens “know better,” their behavior lags behind their own learning and physical maturation. The brain is simply behind the curve.

The gangly adolescent brain collides quite clumsily with puberty. Some neuroscientific research suggests that reward sensitivity may peak during puberty,⁵² thus conferring heightened susceptibility and vulnerability to physical gratification among teens. Consequently, the adolescent years can feel like asking an inexperienced teenager to jockey a high-spirited stallion. Because teens’ physical desires develop before their brains are ready, the adolescent brain is disadvantaged in the struggle against the natural man at the very time the natural man is “bulking up.” Picture a gangly teen facing Goliath and you’ve fairly well captured the situation and the essential divine intervention, which for most of us is developmentally incremental, not monumental as it was for young David.⁵³

We already grasp the developmental vulnerabilities of the adolescent brain. Add puberty to that and we have two developmental trajectories prone to collide head-on. Hormonally charged sexual maturation produces romantic motivation, sexual interest, and emotional motivation and intensity.⁵⁴ Not surprisingly, then, the onset of puberty is correlated with increased risk-taking, novelty-seeking, and sensation-seeking behaviors.⁵⁵ However, the adolescent brain is, as yet, underdeveloped in its capacity to grapple with all this.

Consequently, these are challenging years during which teens are vulnerable to emotional and behavioral problems.⁵⁶ No wonder they often feel confused and overwhelmed—unable to explain even to themselves some of their actions. Never mind that these experiences may seem so manageable from an adult perspective down the road a decade or more. The need for Christ's Atonement during the developmental years and difficult experiences of adolescence is clear. And there is yet more to the picture.

Spiritual awakening—spiritually sensitized

The adolescent years are a time of spiritual awakening—a personal awakening independent of and differentiated from parents' and leaders' faith. The Savior himself was found in the temple at twelve years of age, fully engaged in his own spiritual awakening and development. Adolescent search for personal identity⁵⁷ includes spiritual identity. This involves grappling with life's existential questions such as, "What is the meaning of existence and my place in it?" "Is there purpose and meaning in life, and am I connected to it?" "What represents the good life and the moral life?" "Do I have identity and connections beyond this life?" "Is there a God, and what is my connection and communion with the divine?" These existential questions are life's *big* questions, and our answers to them have profound implications for our sense of personal identity, place, and belonging. Spiritual identity development makes a vital contribution to overall identity, anchoring us with purpose, place, and belonging across the lifespan. Spiritual awakening is a critical development in adolescence, especially as teens increasingly engage with the world at large.

Elements of Spiritual Awakening

Achieved spirituality may be thought of as comprising three distinct elements: (a) experience of congruence of one's behavior with core values and moral feeling; (b) feeling of meaning, purpose, and value in one's life; and (c) experience of communion with the transcendent—with Deity.

Among Latter-day Saint youth, explanations and testimony of the answers to life's existential questions have been offered repeatedly. From an early age, spiritual practices such as prayer have been instituted and habituated. Brain development, though, now enables young people to *personally* grapple with these questions and achieve a more *real and personal communion*. Cognitive development—in particular, the capacity for abstract thought⁵⁸—may offer a partial explanation of the timing of spiritual awakening to the teen years.

In consequence of brain development beginning during early adolescence, including the pre-frontal cortex beginning to come online, teens begin to be capable of Piaget's formal mental operations,⁵⁹ including dramatic improvements in abstract thought and reasoning as well as cognitive control and behavior inhibition.⁶⁰

Arguably, formal mental operations (abstract thought, reasoning, and mental modeling) which emerge and develop during adolescence are required to fully grasp and grapple with life's existential questions—our journey of faith. Thus, brain development enables spiritual awakening, our ability to engage and wrestle with life in terms of meaning, value, and transcendence. It is no surprise, then, that spiritual identity development occurs concurrent with other aspects of identity development during the adolescent years. Therefore, spiritual awakening is a third developmental event (or rather, journey) of adolescence.

Complications and Collisions Attending Spiritual Awakening

Spiritual awakening during adolescence further complicates an already challenging developmental experience. While cognitive development *is under way*, catalyzing spiritual awakening, brain development enabling emotional and behavioral regulation is far from *complete*, and pubertal developments are a powerful influence. The adolescent brain and puberty combine and collide head-on with spiritual awakening. Spiritual and moral idealism, zeal, and perfectionism come up hard against these developmental limitations and vulnerabilities. Metaphorically, spiritually, and literally, teenagers are high-risk drivers both on the road of life as well as on the highway. Brain (cognitive) development makes teens capable of spiritual awakening and striving as well as moral idealism during early adolescence, well before the capacity for self-regulation is fully formed.⁶¹ Thus, residual developmental limitations (the adolescent brain) and vulnerabilities (the onset of puberty with awakening of sexual drive) mean that almost every adolescent or young adult will stumble—and some will break down—as their spiritual and moral idealism, zeal, and perfectionism collide with the "coming of age" of the natural man. Again, we need only look so far as the scriptures—consider the accounts of Nephi, Paul, Enos, Alma the Younger, and Joseph Smith—for prophets' own poignant personal narratives of this collision.

So, spiritual awakening occurs in what is already a maelstrom of developmental upheaval, tests, and trials. Adolescence is indeed a precarious time.

The developmental momentum of adolescence is an often confusing and confounding high-speed transit and collision of these three parts. Adolescents trying to successfully navigate spiritual awakening through the already hazardous intersection where brain development comes into contact with puberty are clearly at risk. But, what are they at risk for?

When spiritual awakening sparks sincere striving, and that striving comes up against a not yet fully mature brain already pressed by puberty, teens are at risk for finding themselves right where we found Caleb—in a place of abject despair where spiritual desire has run head-on into pubertal drive at its peak. Spiritual awakening heightens awareness of and attention to our weaknesses (see Ether 12:27). Therefore, we must be careful, because for zealous, perfectionistic, extreme-thinking teens, awareness of weakness can be devastating and can become debilitating. For some teens who both struggle more than others *and* are also spiritually sensitive and full of spiritual integrity, awareness of weakness can present the very real risk of initiating a *spiritual death spiral*. This occurs as spiritual perfectionism comes into contact with powerful and persistent mortal weakness, yielding toxic shame and crippling guilt.⁶²

We see this spiritual awakening—and collision—in the scriptural narratives shared by Nephi, Enos, Alma the Younger, and Joseph Smith. We also see how their faith in Christ rescues them from a potential spiritual death spiral. Not *if* but *when* teens stumble, the reality of the adolescent brain predicts a pretty severe psychological, emotional, and spiritual collision—at least for some. As we have previously documented, the adolescent brain's tendency to dichotomous, polarized thinking includes viewing right and wrong and one's own behavior in extreme terms of either good or evil, not in a developmentally nuanced and patient way. Therefore, when the spiritually sincere, striving teen falls short again and again in the battle with the natural man, he or she may readily conclude, "I'm not a good person." Teens are prone to being plagued by guilt and "beating themselves up" over their mistakes. Identity is easily framed in drastic perspective; for example, "Since I am not good (perfect), I am bad!" Spiritual incongruence then infects the other elements of spirituality: "If I am bad, then God can't love me and he won't speak to me" (communion); "How could God have any use for a person like me?" (meaning, purpose, value). A teen's achieved spiritually (as we previously defined it) is at risk of being seriously undermined.

Thus, during adolescence, we're involved in critical spiritual identity development. This includes the development of core values, personal

purpose or meaning in life, and communion with God. All of these facets of spirituality provide a defining sense of self. However, this spiritual identity development runs the risk of being impaired, turned to despair, or broken by adolescent experience. Because executive functions are not fully developed, there is ample opportunity for "suboptimal" behavioral⁶³ and *then* spiritual trajectories to develop. In other words, behavioral stumbling is likely and, for some, likely to lead to spiritual implosion. When developmental neurobiologists speak of "gains in intellectual abilities that seem not to be integrated into life choices,"⁶⁴ no doubt their findings touch upon teens' *capacity* for spiritual awakening combined with their *vulnerability* to behavioral and spiritual stumbling. This stumbling may be largely occasioned by the limitations of the adolescent brain combined with the onset of puberty which, in our times, occurs in an increasingly toxic environment. Thus, we see spiritual awakening occurring without a proportionate ability to regulate behavior consistent with that awakening to spiritual and moral ideals. The collision of these combined conditions and developments is predictable. Clearly, the out-of-sync timing of adolescent development on these three fronts puts teens at jeopardy for a devastating collision.

Spiritual awakening and puberty together collide with the developmental limitations of the adolescent brain. Teens' brains make them prone to globalization, overgeneralization, and thinking in "all or nothing" terms. Thus, when spiritual awakening comes up hard against developmental brain limitations and powerful pubertal drives, this collision can lead to recurring stumbling. When this happens, the adolescent brain often thinks, "I'm not doing *anything* right!" "I'm a complete failure!" "As long as I have this problem in my life, I can't be a good person." "A single mistake puts everything back to where it was before." Teens don't separate *behavior* from *identity*. Even a sin that is an anomaly in the overall context of a teen's life still shapes an overall sense of personal "badness." Teens don't view their struggle in the overall context of their lives alongside all their strengths and virtues. Extreme, all-or-nothing thinking prevents the good from softening the blow and lessening the weight of the bad. Their redeeming virtues, which are often readily observed by others, don't redeem a teen's sense of self. Any and every weakness is a bogeyman that haunts them, devastates them, and casts a dark shadow over them and everything else in their lives. As a result of normal adolescent brain limitations, spiritually awakened teens are prone to obsess upon and be consumed by their "demons."

The adolescent brain is also vulnerable to emotional reasoning that is disconnected from rational cognitive processes. Since this emotional reasoning is also unconscious, it is not easily reached and countered. “I *feel* bad, therefore I *am* bad,” exemplifies emotional reasoning. Teens don’t separate their identity from their behavior or their feelings.

Extreme thinking and emotional reasoning heighten teens’ tendency to experience shame. Shame devitalizes spiritual feeling and saps spiritual drive. Guilt targets behavior while shame attacks the person, eroding teens’ positive identity—their sense of divine nature. Shame is debilitating. The adolescent brain’s vulnerability to thinking in extreme black and white terms, being prone to globalizing and overgeneralizing, and susceptibility to emotional reasoning, makes teens prone to an *exaggerated* experience of guilt, disproportionate to their mistakes and blind to their strengths and virtues. For teens (even more than adults), this guilt readily transforms into deep shame. Lost to shame is their feeling of their divine nature and potential. Teens’ tendency to an exaggerated negative assessment of themselves, far from supporting repentance, actually risks hindering repentance—undermining change confidence, resolve, and action.⁶⁵

Parents’, leaders’, and adolescents’ personal comprehension and witness of the Atonement is what enables safe and successful navigation of this perilous developmental intersection. Without our comprehension, witness, and application of the Atonement, developmental perspective and patience are likely to be lost on our youth (and possibly parents and leaders, too), and teens’ lives may become overshadowed and overwhelmed with despair, despondency, and feelings of failure. For some few, a spiritual death spiral is a very real risk—a possibility which Nephi’s and Paul’s narratives hint at.

Three internal forces

In sum, the adolescent brain, the onset of puberty with its awakening of physical desire, and spiritual awakening represent three internal forces bearing down powerfully upon adolescents.

Growing Up in a Fallen World

Two external pressures add to the danger of the developmental intersection we have described and increase the risks of significant spiritual stumbling and reactions that could trigger a spiritual death spiral.

A sexually saturated environment

Growing up in today’s fallen world, our youth encounter an environment saturated with sexual cues and enticements quite unlike anything any other generation has encountered. The difference lies in the pervasiveness of sexual cues, the accessibility of sexual enticements, and the tempting assurance of anonymity.⁶⁶ Media permeates our environment and unwelcome influences infiltrate our homes, yet the adolescent brain, already wrestling with the hormonally triggered challenges of puberty, is ill-equipped to fend off carefully placed cues precisely crafted to prey upon impulsivity and natural sexual appetite.

In brain studies, presentation of intense stimuli has been shown to elicit increased attentional resources,⁶⁷ including among those who have previously struggled behaviorally.⁶⁸ Thus, neurological evidence backs up common sense that living in a society saturated with intense visual and other cues to physical appetites of all kinds will tax teens’ brain strength.⁶⁹ Teens today are challenged and tested more severely than previous generations. Blatant and intense sexual stimuli are among the most pervasive and taxing for pubertal teens, relentlessly triggering and cattle-prodding appetite. The human brain was designed for a more natural habitat than the one we encounter today; it was not designed for our modern environment which is flooded with manufactured cues and triggers to appetite and impulse, and the adolescent brain in particular is at acute behavioral risk.

Parental reactions—from where adults stand

So here we have this situation where adults and adolescents alike recognize “an increased need to regulate affect and behavior in accordance with long-term goals and consequences, often at a distance from the adults who provided regulatory structure and guidance during childhood.”⁷⁰ Yet the teen brain is inadequately equipped for the challenge, and puberty is only making things more difficult.

Where do parents stand in all of this? First, it’s easy to forget our own adolescent years and instead project our adult experience onto our teens. Adults have the fully developed capacity of the mature brain and years of experience learning to bridle physical desire as well as learning and practicing various cognitive, behavioral, emotional, and spiritual means to gain self-mastery. Additionally, in adulthood, certain drives and desires (including physical sexual drive) are no longer at their peak, and intensity of emotional

experiences ebbs, and the spiritual perfectionism of our own youth is now tempered by maturity. Spiritually, adults have had their own experiences through which they've come to better understand how the Atonement relates to mortal experience. Therefore, it is easy to understand how parents and leaders no longer see or experience the world as our teens do and can misstep in relating to adolescents' experiences and their troubled feelings. Since adolescents often look so grown up, parents and leaders often forget that teens aren't adults yet—they're not fully grown. Thus, we are liable to act and react as though our youth are fully capable and ought to *think, feel, and act* like adults. Can we hear the echo of our own demand, "Why don't you act like an adult?"—in spite of the fact that if we stop, think carefully, and remind ourselves, we know better. We "get" their developmental situation, but we also readily forget it.

Beyond adult forgetfulness, and teaming up tragically with teens' own "all-or-nothing" thinking, some parents' and leaders' high ideals and ambitions for their youth lead them to similarly set their sights on a perfect trajectory. Well-meaning or ambitious parents may push for perfection from their teens and relate to them in terms of an uninterrupted, "no-detour" unfolding of the Church's developmental trajectory along the ideal timeline. For a few parents and leaders, the inevitable frustration of the perfect plan provokes some impatience and aggravation—especially when the frustration of "the plan" comes because of perplexing quirks of the adolescent brain in action. We often ask so much more from our teens than we ourselves achieved. Certainly this is, in part, out of a desire to see them progress along the path far more accident-free than we ourselves did. Perhaps it is also sometimes in part out of desire for reflected glory from their "perfect lives."

It is not surprising then that parents or other adults are prone to exclaim, "What were you thinking!" when "out-of-the-blue" impulses and powerful emotions steal the stage and undermine teens' best intentions to govern current behavior in the light of long-term goals and sincerely held values and beliefs. Early on, when Caleb's struggle began and he tripped up again and again, his father's and sometimes his mother's tones of voice and hands raised to their foreheads reflected their disbelief and incredulity. "How could you forget yesterday's conversation and commitments so quickly?" Actually, Caleb remembered them very well, and expressed how committed he remained to them, which only perplexed him and his parents all the more. This disconnect seems so inexplicable to the adult mind—how dreams, plans, and goals can

be so easily eclipsed by the moment. When Caleb's mother asked, "Don't you see how this is taking you away from everything you say you want?" Caleb assured her he did. Yet there was still this perplexing disconnect that he too couldn't explain. He didn't know either how instant impulses and powerful emotions so easily stole the stage. Teens' common answer to parents' questioning is some version of, "I don't know," which is an honest expression of their *own* confusion and consternation. They act befuddled because they are befuddled. All around, it's no easy thing living inside a teenage body.

As adults see teens so obviously compromise the teens' own future plans, parents are understandably incredulous, flabbergasted, and frustrated. Teens' inability to "explain themselves" may only exacerbate adult exasperation. For adults without sufficient developmental understanding, teens' "I don't know" answer may seem incomprehensible, insufficient, and leave parents and leaders befuddled, exasperated, and possibly disbelieving—tempted to attribute sinful intent.

Try as we might to make it otherwise, words, tones, gestures, and countenance tend to mirror inward bewilderment and skepticism. The tones of adults' responses can often enough be tones of incredulity and disbelief, frustration and impatience, or exasperation and desperation. Perhaps anger sometimes creeps in, too. Such verbal and nonverbal responses are unintentionally shaming, and, to the spiritually sincere teen, that is devastating!

Teens are prone to thinking in extremes, so their shame triggers personal and interpersonal negativity. Already feeling fundamentally flawed, they are prone to falsely construe that others surely "know they're bad," too. Negative attributions largely of their own making depress their mood, discourage attempts to do better, and risk leading them to retreat from crucial relationships. Although parents and leaders are usually innocent of punitive intent, if they react from adult perspective and experience, their own emotional experience is likely to leak into their interactions with their struggling teens and have a shaming effect that is demeaning and debilitating. Teens all too readily suppose they see disappointment, discouragement, frustration, impatience, and so forth in adult responses. For them, this only confirms their own perceptions of their deficit nature and deficit lives. The result is an added weight of guilt and shame likely to bow them down in despair. Yet despair is not contrition, nor is it conducive to repentance. Rather, shame and despair undermine confidence, erode resolve, and cripple efforts at change.

Two external influences

Thus, we have three internal influences bearing down on teens and colliding with each other: the adolescent brain, puberty, and spiritual awakening. To these we add two external conditions: a sexually saturated environment and possible (even if unintentional) shaming responses from parents or leaders that make the experience of adolescence more difficult and increase the risk of spiritually sincere teens falling into a spiritual death spiral.

Conclusion

So this is how Caleb got to that church stage, where we find him alone and feeling increasingly isolated and dangerously alienated. What should we do? What should his father and mother do? How should his leaders respond and help? We address these questions in “Part 2: The Rescue,” building our answer from the counsel Helaman offered his own young sons:

And now, my sons, remember, remember that it is upon the rock of our Redeemer, who is Christ, the Son of God, that ye must build your foundation; that when the devil shall send forth his mighty winds, yea, his shafts in the whirlwind, yea, when all his hail and his mighty storm shall beat upon you, it shall have no power over you to drag you down to the gulf of misery and endless wo, because of the rock upon which ye are built, which is a sure foundation, a foundation whereon if men build they cannot fall.⁷¹

Notes

1. Special appreciation is expressed to Paige M. Cutler and Frances M. Grover for their able assistance.

L. Steinberg, “Cognitive and Affective Development in Adolescence,” *Trends in Cognitive Sciences* 9, no. 2 (2005): 69.

2. Not his real name. Identifying information is altered to protect confidentiality.

3. Young men in the LDS Church are in a unique situation. Their priesthood participation through the ordinance of the sacrament is a very public service, and adolescents are prone to believe that everyone’s watching, and that when they cannot serve everyone knows. A young man who has been instructed by his bishop not to participate may sit with his family. Yet of course there will likely be an occasion where he is sought out by other members of his quorum and must decline to serve. His response, “No, I can’t today,” feels so self-incriminating to him. A young man may feel he wears the proverbial scarlet letter for everyone to see and may shrink in embarrassment and shame. Too many young people pull away from the blessings and fellowship of the Church. Parents and leaders ought to go in search of these young men. Thomas S. Monson, “To the Rescue,” *Ensign*, May 2001, 48–50.

4. Mark H. Butler, *Spiritual Exodus: A Latter-day Saint Guide to Recovery from Behavioral Addiction* (Provo, UT: BYU Academic Press, 2010).

5. A central learning purpose in our paper is to catch on to and hold clearly in our minds how the adolescent brain can trip up the spiritually sincere, striving teenager—in the very worst situations producing a dangerous “spiritual death spiral.”

6. *Endogenous* forces arise internally, within the human body. These are organismic. *Exogenous* forces arise externally, outside the human body. These are environmental.

7. Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74.

8. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development,” *Research FACTs and Findings* (2002): 1–4, http://www.actforyouth.net/resources/rf/rf_brain_0502.pdf; L. Steinberg, “Risk-Taking in Adolescence: What Changes, and Why?” *Annals of the New York Academy of Sciences* 1021, no. 1 (June 2004): 51–58; Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74; L. Steinberg et al., “The Study of Developmental Psychopathology in Adolescence: Integrating Affective Neuroscience with the Study of Context,” 710–41, in *Developmental Psychopathology*, Vol. 2: *Developmental Neuroscience*, ed. D. Cicchetti & D. J. Cohen, 2nd ed. (Hoboken, NJ: John Wiley and Sons, 2006); D. Yurgelun-Todd, “Inside the Teen Brain,” interview, *Frontline*, PBS, 2002, <http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/interviews/todd.html>.

9. A. S. Bruce et al., “A Comparison of Functional Brain Changes Associated with Surgical Versus Behavioral Weight Loss,” *Obesity* 22, no. 2 (February 2014): 337–43; C. D. Jensen and C. B. Kirwan, “Functional Brain Response to Food Images in Successful Adolescent Weight Losers Compared with Normal-Weight and Overweight Controls,” *Obesity* 23, no. 3 (March 2015): 630–36, doi: 10.1002/oby.21004; Duc Son N. T. Le et al., “Less Activation of the Left Dorsolateral Prefrontal Cortex in Response to a Meal: A Feature of Obesity,” *American Journal of Clinical Nutrition* 84, no. 4 (October 2006): 725–31; Duc Son N. T. Le et al., “Less Activation in the Left Dorsolateral Prefrontal Cortex in the Reanalysis of the Response to a Meal in Obese Than in Lean Women and Its Association with Successful Weight Loss,” *American Journal of Clinical Nutrition* 86, no. 3 (September 2007): 573–79; J. M. McCaffery et al., “Differential Functional Magnetic Resonance Imaging Response to Food Pictures in Successful Weight-loss Maintainers Relative to Normal-weight and Obese Controls,” *American Journal of Clinical Nutrition* 90, no. 4 (2009): 928–34; Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74; D. Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” *Current Opinion in Neurobiology* 17, no. 2 (April 2007): 251–57.

10. Bruce et al., “A Comparison of Functional Brain Changes,” 337–43; Jensen and Kirwan, “Functional Brain Response to Food Images,” 630–36; Le et al., “Less Activation of the Left Dorsolateral Prefrontal Cortex in Response to a Meal: A Feature of Obesity,” 725–31; Le et al., “Less Activation in the Left Dorsolateral Prefrontal Cortex in the Reanalysis of the Response to a Meal in Obese Than in Lean Women,” 573–79; McCaffery et al., “Differential Functional Magnetic Resonance Imaging Response,” 928–34; L. Steinberg, “Cognitive and Affective Development in Adolescence,” *Trends in Cognitive Sciences* 9, no. 2 (2005): 69; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

11. Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74; Merlin Donald, *A Mind So Rare: The Evolution of Human Consciousness* (New York: Norton, 2001); B. Luna et al., “Maturation of Widely Distributed Brain Function Subserves Cognitive Development,” *NeuroImage* 13, no. 5 (May 2001): 786–93, doi: 10.1006/nimg.2000.0743; J. Newman and A. A. Grace, “Binding across Time: The Selective Gating of Frontal and Hippocampal Systems Modulating Working Memory and Attentional States,” *Consciousness*

and Cognition 8, no. 2 (1999): 196–212; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

12. Steinberg, “Cognitive and Affective Development in Adolescence,” 73.

13. H. T. Chugani, “Biological Basis of Emotions: Brain Systems and Brain Development,” *Pediatrics* 102, no. 5 Suppl. E (November 1998): 1225–29; T. Paus, “Mapping Brain Maturation and Cognitive Development during Adolescence,” *Trends in Cognitive Sciences* 9, no. 2 (February 2005): 60–68, doi: 10.1016/j.tics.2004.12.008; Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

14. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development”; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

15. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development.”

16. Frances E. Jensen and David K. Urion, in D. B. Ruder, “A Work in Progress: The Teen Brain,” *Harvard Magazine*, September–October 2008, <http://harvardmagazine.com/2008/09/the-teen-brain.html>.

17. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development”; Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

18. Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

19. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development”; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

20. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development”; L. P. Spear, “The Adolescent Brain and Age-Related Behavioral Manifestations,” *Neuroscience and Biobehavioral Reviews* 24, no. 4 (June 2000): 417–63, doi: 10.1016/S0149-7634(00)00014-2; Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

21. Jensen and Kirwan, “Functional Brain Response to Food Images,” 630–36; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

22. Jensen and Kirwan, “Functional Brain Response to Food Images,” 630–36.

23. I. M. Rosso et al., “Cognitive and Emotional Components of Frontal Lobe Functioning in Childhood and Adolescence,” *Annals of the New York Academy of Sciences* 1021, no. 1 (June 2004): 355–62; K. Rubia et al., “Functional Frontalisation with Age: Mapping Neurodevelopmental Trajectories with fMRI,” *Neuroscience and Biobehavioral Reviews* 24, no. 1 (January 2000): 13–19; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

24. S. C. Steffensen, “The Biological Basis of Addiction,” Campus Education Week presentation, Brigham Young University, Provo, UT, August 19, 2013.

25. J. Giedd et al., “Brain Development during Childhood and Adolescence: A Longitudinal MRI Study,” *Nature Neuroscience* 2, no. 10 (October 1999): 861–63.

26. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development.”

27. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development.”

28. Steinberg, “Cognitive and Affective Development in Adolescence,” 73.

29. Thus it is that scholars metaphorically suggest a baseline risk of lifetime struggle with addiction if experimentation begins after age twenty-one, double the risk if it begins between eighteen and twenty, and ten times the risk if significant experimentation with addictive

behaviors begins prior to age eighteen. The formative years are powerfully, though not fatalistically, influential in our lives.

30. Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

31. Steinberg, “Risk-Taking in Adolescence: What Changes, and Why?” 51–58;

Steinberg, “Cognitive and Affective Development in Adolescence,” 69–74; Steinberg et al., “The Study of Developmental Psychopathology in Adolescence,” 710–41.

32. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development”; Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

33. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development”; Yurgelun-Todd, “Inside the Teen Brain,” interview.

34. ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development”; D. A. Yurgelun-Todd and W. D. Killgore, “Fear-Related Activity in the Prefrontal Cortex Increases with Age during Adolescence: A Preliminary fMRI Study,” *Neuroscience Letters* 406,

35, no. 3 (October 2006): 194–199; ACT for Youth Upstate Center of Excellence, “Adolescent Brain Development.”

Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251–57.

36. Steinburg, “Cognitive and Affective Development in Adolescence,” 69.

37. Steinberg, “Cognitive and Affective Development in Adolescence,” 69.

38. Jensen and Urion, in Ruder, “A Work in Progress: The Teen Brain.”

39. Jensen and Urion, in Ruder, “A Work in Progress: The Teen Brain.”

40. Steinberg, “Cognitive and Affective Development in Adolescence,” 73.

41. Steinberg, “Cognitive and Affective Development in Adolescence”; see also Steinberg et al., “The Study of Developmental Psychopathology in Adolescence.”

42. Purveyors of addictive substances and behaviors are fully aware that if the formative developmental experiences and skills development of adolescence can be sidestepped, enduring dependency on palliative addictive “altered states” and “escapes” can be formed. In the case of addiction, *pruning* of unused connections—the final brain development—snaps shut the developmental trap, leaving adults with underdeveloped or nonexistent options for healthy management of life’s challenging experiences.

43. Mosiah 3:19.

44. Very often, but not universally, prepubescent children’s interest in the opposite sex is more about gender curiosity and exploration than sexuality per se and should be treated as such. Absent sexual abuse and socialization by older children or adults, children’s interest in pornographic depictions most likely occurs as an extension of this gender curiosity. Masturbation is more likely nonsexual self-pleasuring and self-comforting.

45. Steinberg, “Cognitive and Affective Development in Adolescence,” 70.

46. Steinberg, “Cognitive and Affective Development in Adolescence.”

47. Steinberg, “Cognitive and Affective Development in Adolescence,” 69–70.

48. Steinberg, “Cognitive and Affective Development in Adolescence,” 70.

49. Steinberg, “Cognitive and Affective Development in Adolescence.”

50. D. P. Keating, “Cognitive and Brain Development,” in *Handbook of Adolescent Psychology*, 2nd ed., ed. R. J. Lerner and L. D. Stenberg (New York: Wiley, 2004), 45–84.

51. Jensen and Urion, in Ruder, “A Work in Progress: The Teen Brain.”

52. C. M. Friemel, R. Spanagel, and M. Schneider, “Reward Sensitivity for a Palatable Food Reward Peaks during Pubertal Development in Rats,” *Frontiers in Behavioral Neuroscience* 4, no. 39 (2010): n.p., doi: 10.3389/fnbeh.2010.00039.

53. There is risk for disappointment and discouragement in setting forth for our youth the stories of miraculous, monumental victories in our struggles against the Goliaths in our lives. Some of the youth may wonder, “So, what’s wrong with *me* that *I* don’t have that experience?” While we might wish to bring down our Goliaths once and for all, growth and change are more developmental. President Ezra Taft Benson taught, “Becoming Christlike is a lifetime pursuit and very often involves growth and change that is slow, almost imperceptible. The scriptures record remarkable accounts of men whose lives changed dramatically, in an instant as it were: Alma the Younger, Paul on the road to Damascus, Enos praying far into the night, King Lamoni. Such astonishing examples of the power to change even those steeped in sin give confidence that the Atonement can reach even those deepest in despair. But we must be cautious as we discuss these remarkable examples. Though they are real and powerful, they are the exception more than the rule. For every Paul, for every Enos, and for every King Lamoni, there are hundreds and thousands of people who find the process of repentance much more subtle, much more imperceptible.” Ezra Taft Benson, “A Mighty Change of Heart,” *Ensign*, October 1989, 5.

54. R. E. Dahl, “Adolescent Brain Development: Vulnerabilities and Opportunities,” keynote address, *Annals of the New York Academy of Sciences* 1021 (June 2004): 1–22.

55. Dahl, “Adolescent Brain Development: Vulnerabilities and Opportunities,” 1–22.

56. Steinberg, “Cognitive and Affective Development in Adolescence”; see also Steinberg et al., “The Study of Developmental Psychopathology in Adolescence.”

57. See E. H. Erikson, *Identity: Youth and Crisis* (New York: Norton, 1968).

58. See Bärbel Inhelder and Jean Piaget, *The Growth of Logical Thinking from Childhood to Adolescence: An Essay on the Construction of Formal Operational Structures*, trans. Anne Parsons and Stanley Milgram (New York: Basic Books, 1968); Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence.”

59. See Inhelder and Piaget, *The Growth of Logical Thinking from Childhood to Adolescence*.

60. See Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251; Rosso et al., “Cognitive and Emotional Components of Frontal Lobe Functioning in Childhood and Adolescence”; Rubia et al., “Functional Frontalisation with Age: Mapping Neurodevelopmental Trajectories with fMRI,” 13–19; Steinberg, “Cognitive and Affective Development in Adolescence.”

61. Steinberg, “Cognitive and Affective Development in Adolescence.”

62. Cf. Joseph Smith History 1:28. In this verse we see depicted the spiritual sincerity and zealous perfectionism of a spiritually awakened youth. When Joseph recounts his “native cheery temperament,” some may ascertain a reflection upon the joyful exuberance, boisterousness, and impulsivity of our young people. This sometimes leads to behavioral excess with a bit of recklessness thrown in, colliding with spiritual ideals. Then we hear Joseph also riding hard on himself for his perceived shortcomings. Nephi’s account offers a close parallel narrative. See 2 Nephi 4:16–18. While these prophets and other youth and adults are ultimately able to bridle and temper spiritual perfectionism, in part through their understanding and application of the Atonement, religious perfectionism becomes for some problematic, even toxic. For an instructive example of psychologically and spiritually debilitating perfectionism, see C. H. Miller and D. W. Hedges, “Scrupulosity Disorder: An Overview and Introductory Analysis,” *Journal of Anxiety Disorders* 4 (2008): 1042–58.

63. Steinberg, “Cognitive and Affective Development in Adolescence,” 73.

64. Yurgelun-Todd, “Emotional and Cognitive Changes during Adolescence,” 251.

65. Tradition (including in clinical practice) long held that pain and punishment promoted change. As Miller and Rollnick describe, “A certain folk belief seems to be embedded in some cultures and subcultures: [namely, that] change is motivated primarily by the avoidance of [pain]. If you can just make people feel bad enough, they will change. [So you] punish undesired behavior. . . . [The belief is that] people would be motivated to change . . . [if they felt] enough discomfort, shame, guilt, loss, threat, anxiety, or humiliation. . . . In this view, people don’t change because they haven’t yet suffered enough.” William R. Miller and Stephen R. Rollnick, *Motivational Interviewing: Preparing People for Change*, 2nd ed. (New York: Guilford, 2002), 11–12. Thus confrontation was common, and guilt (“feeling bad”) embraced. Decades of scientific advances in our clinical understanding of change process and change motivation have taught us otherwise. “Humiliation, shame, guilt, and angst are not the primary engines of change. Ironically, such experiences can even immobilize the person, rendering change more remote” (12). Indeed, excessive guilt and shame, punishment and pain can lead a person back to addictive escape, setting up a vicious emotional and spiritual death spiral. “Instead [of pain and punishment, guilt and shame producing change], constructive behavior change [comes] . . . when the person connects [change] . . . with something of intrinsic value, . . . something cherished. Intrinsic motivation for change arises in an accepting, empowering atmosphere that makes it safe for the person to explore the . . . painful present in relation to what is [deeply] wanted and valued” (12).

66. The media environment has long been sexually charged, and, with advent of the Internet, sexual cues and enticements permeate browser pages at seemingly every turn and infiltrate our homes. Some people have denoted a unique “Triple-A” engine of compulsion consisting of the *accessibility*, *affordability*, and *anonymity* the Internet offers.

67. S. Yokum, J. Ng, and E. Stice, “Attentional Bias to Food Images Associated with Elevated Weight and Future Weight Gain: An fMRI Study,” *Obesity* 19, no. 9 (2011): 1775–83.

68. Jensen and Kirwan, “Functional Brain Response to Food Images,” 630–36.

69. The target behavior in this and some other executive control function studies is obesity, and the neural stimulus is the presentation of food images. It is reasonable to assume, however, that executive control is a general and generalizable brain function. It is also reasonable to assume a specific generalizability to sexual behavior, triggers, and regulation, since both eating and sexual behavior are primal endogenous survival drives and both are visually cued/triggered.

70. Steinberg, “Cognitive and Affective Development in Adolescence,” 69.

71. Helaman 5:12.