## Science of Adolescent Learning:

How Identity and Empowerment Influence Student Learning

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ALLIANCE FOR EXCELLENT EDUCATION



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The **Alliance for Excellent Education** (All4Ed) is a Washington, DC-based national policy, practice, and advocacy organization dedicated to ensuring that all students, particularly those underperforming and those historically underserved, graduate from high school ready for success in college, work, and citizenship. **all4ed.org** 

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### **Executive Summary**

As the U.S. education system prepares middle and high school students for college, careers, and life, educators must ensure that schools facilitate one of the key drivers of adolescent learning: identity development. Findings from neuroscience and the cognitive sciences have deepened researchers' understanding of the identity development process, the role brain development plays in identity formation, and the effects of healthy identity development on middle and high school students' learning. As adolescents negotiate differing aspects of their identities, they shape their behaviors and perceptions to accommodate a cohesive vision of who they are and who they aspire to be. At the same time, they come to understand how their identities shape behaviors and perceptions of others and orient them in their classrooms and the world. The process of identity development coincides with an increased desire for adolescents to exert greater agency over their own lives and the environments surrounding them. Adolescents seek opportunities to change the world around them and flex newly equipped cognitive and social tools to be agents who positively impact the communities in which they live and the institutions that govern their lives.

This report examines learning and development research that supports the Alliance for Excellent Education's (All4Ed's) Science of Adolescent Learning (SAL) Research Consensus Statements 17–20 (see page 4 for statements). The report highlights the following essential findings about adolescent learning and development:

- 1. Identity development is a key undertaking of adolescence influenced by the changing brain and increasingly complex social structures of adolescents' lives. Identity development is a complicated, constant process of negotiating different aspects of oneself, informed by the communities and peoples to whom adolescents relate in their lives. Exploring meaning and searching for purpose during adolescence are core aspects of identity development that occur within a cultural context that assigns value to the identities, meanings, and purposes adolescents adopt. Healthy identity development is an important and challenging process for all students, including historically underserved students who may not share identities with the majority of individuals in a society.
- 2. During adolescence, improved functioning of cognitive skills and sensitivity to social interactions and environments leads to higher levels of agency. Adolescents can exercise greater control over themselves and their surrounding environment through conscious, voluntary individual and collective actions. Adolescents seek to expand their agency and use that agency to impact the institutions and systems that govern their lives.
- 3. Underlying adolescents' agency is their improved ability to self-regulate. Self-regulatory skills further develop during adolescence and are informed by adolescents' perceptions of their identities. This heightened aptitude for self-regulation offers new opportunities and responsibilities for middle and high school students. Adults must provide the support, experiences, and opportunities adolescents need to develop self-regulation properly.

This report also recommends ways educators, policymakers, and advocates can support the learning and development of adolescent students, including historically underserved students, by applying SAL to policies and practices. By understanding the range of neurological developments and environmental factors that affect adolescent learning, educators and leaders can support adolescents as they navigate increasingly complex social and political systems, leading to their academic and postsecondary success.

### About All4Ed's SAL Consensus Statement Report Series

In November 2017, All4Ed convened researchers, practitioners, and policy experts to examine advances in research and how recent findings from SAL can advance student learning and inform high school improvement strategies under the Every Student Succeeds Act (ESSA). During the event, an interdisciplinary group of researchers representing multiple scientific perspectives identified the most critical learning needs of adolescents.

After the convening, the researchers collaborated with All4Ed to develop a set of consensus statements about adolescent learning and development research, listed on pages 3–4. These statements, along with an accompanying series of reports, provide the foundation for <u>All4Ed's SAL initiative</u>. Each of the reports listed below translates supporting research on adolescent learning and development that informs the consensus statements, which are grouped by theme. The reports also offer key considerations for education practitioners and policymakers on how best to support adolescent learning, particularly for students from historically underserved populations:

- 1. Science of Adolescent Learning: How Body and Brain Development Affect Student Learning
- 2. Science of Adolescent Learning: Risk Taking, Rewards, and Relationships
- 3. Science of Adolescent Learning: Valuing Culture, Experiences, and Environments
- 4. Science of Adolescent Learning: How Identity and Empowerment Influence Student Learning

The following researchers, all members of All4Ed's Expert Advisory Group, endorse the consensus statements and continue to support All4Ed's SAL initiative and this report series in their respective areas of expertise:

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To learn more about All4Ed's SAL initiative, visit <u>all4ed.org/SAL</u>.

### All4Ed's SAL Research Consensus Statements

### Consensus statements featured in report 1

- 1. In addition to body changes, the onset of puberty may trigger a second period of brain plasticity, increasing both the opportunity and vulnerability inherent in adolescence. Certain life conditions may cause the process of puberty to occur earlier or later, meaning that physical, cognitive, social-emotional, and other changes associated with puberty can begin at various ages.
- 2. Adolescents are in a stage of development during which the brain becomes more specialized and efficient. Learning experiences and environmental influences play key roles in this process. Learning and development are inextricably intertwined; these dual processes shape patterns of neural connections during adolescence.
- 3. As the brain becomes more interconnected during adolescence, young people are increasingly able to engage in adult levels of complex cognition, such as abstract reasoning, future thinking, and social cognition.
- 4. The ability to form memories and reflect on the accuracy of those memories continues to improve during adolescence. Adolescents become better able to assess their own learning, allowing for more time for additional information gathering and review.
- 5. Adolescents face an increased risk, compared to adults and younger children, for certain issues related to mental health, behavioral health, alcohol and substance use, accidents, trauma, sexual health, and nutrition due to physical, cognitive, and emotional changes they experience.

### Consensus statements featured in report 2

- 6. During adolescence, biological and environmental changes affect motivation and mindset. Because adolescents have an increased sensitivity to social evaluation, praising their learning process and successful strategies, not effort alone, can support development of a positive mindset and motivate them to learn.
- 7. Adolescents are more sensitive to some types of rewards, such as social recognition, than adults and younger children. Adolescents are more likely to engage in both positive and negative forms of risk taking, especially if peers support that behavior.
- 8. The transition from childhood into adolescence is associated with an increased sensitivity to social evaluation, including feelings of belonging, acceptance, admiration, and respect.
- 9. Peer relationships strongly influence adolescents, even more so than younger children, in ways that contribute to opportunities as well as vulnerabilities.
- 10. Compared to younger children, adolescents are able to spend more time with peers without adult supervision. However, support, communication of consistent expectations, and monitoring of activities and emotional functioning by adults are essential as adolescents become more independent.

(continued)

### All4Ed's SAL Research Consensus Statements (continued)

### Consensus statements featured in report 3

- 11. Culture constructs the nature of learning environments and ways adolescents experience them including their values, motivations, and beliefs related to learning.
- 12. Adolescents seek learning environments that are consistent with and meaningful within the social and cultural contexts of their lives.
- 13. Digital technologies, such as computers, the internet, social media, and smart phones, dramatically have changed the way individuals learn, play, and interact with each other. Their impacts may be greatest for adolescents who are young enough to embrace novelty and old enough to master the technologies.
- 14. Adolescence is marked by significant biological shifts, resulting in heightened stress-induced hormonal responses. Stress is a major modulator of human learning and memory processes. As pressures around school, work, and relationships increase, adolescents experience greater stress.
- 15. In addition to physical, social, and emotional impacts that economic disadvantage has on adolescents, poverty and socioeconomic status are associated with a diverse set of neuroscientific structural and functional outcomes. Based on current evidence, the most sensitive systems are those related to executive functions, language, learning, and stress regulation.
- 16. Inequality, bias, and the persistence of structural discrimination constitute serious hazards to the positive development of all adolescents.

### Consensus statements featured in this report

- 17. While adolescents still are developing self-regulatory systems, under some circumstances they make more rational choices with the similar mental capacity of adults. However, the expression of self-regulatory skills depends on context and learning opportunities.
- 18. For adolescents, social and emotional development involves exploring meaning and finding purpose; sometimes this development is at odds with institutional structures and expectations.
- 19. Adolescents are developing their own adult identity, trying to understand their roles and contributions in social contexts and communities. This identity development continues into adulthood, as the individual has more diverse experiences.
- 20. Adolescents seek opportunities for agency where they can decide how they spend their time and influence policies and practices of institutions that shape their lives.

### How Identity and Empowerment Influence Student Learning

For more than half a century, psychologists and sociologists have recognized adolescence as a critical stage of identity development and increased agency. Researchers continue to explore how individuals construct the multifaceted aspects of their identities through their membership in different communities and social groups.

Self-regulation relates closely to the development of identity and agency and is especially crucial as young people confront everyday challenges while simultaneously experiencing intense changes in identity and increased opportunities for agency.

Recent research sheds light on the brain and body systems central to the formation of identity, self-regulation, and agency in adolescence. A variety of skills arise during adolescence, attributed to the development of the brain's prefrontal cortex, that allow adolescents to contemplate their identities and understand complex human structures and systems.

Adolescent development is multifaceted and influenced not only by brain development but also by the many communities and social circles to which adolescents belong. Educators and other adults must understand this to ensure that adolescents receive the proper support and guidance. As adolescents discover who they are, who they want to be, and how they want to impact their communities and society, they are motivated to pursue learning opportunities that align with their goals. Building self-regulatory skills, developing identity, and increasing agency all support adolescents' academic achievement, postsecondary success, and overall healthy development.

The following sections examine the learning, development, and cultural research that supports All4Ed's SAL Research Consensus Statements 17–20 and recommend ways educators, policymakers, and advocates can apply adolescent learning and development research to policy and practice.

### Self-Regulation During an Increasingly Complex Time

SAL Research Consensus Statement 17: While adolescents still are developing self-regulatory systems, under some circumstances they make more rational choices with the similar mental capacity of adults. However, the expression of self-regulatory skills depends on context and learning opportunities.

The ability to manage emotions and behavior in line with the expectations of a situation—a skill known as **self-regulation** allows humans to adapt to a variety of circumstances and challenges of an increasingly complex and interconnected world.<sup>1</sup> By its simplest definition, self-regulation refers to "control [of oneself] by oneself," and it is most essential when making difficult choices, manipulating and elaborating on information, or developing implications through logical reasoning.<sup>2</sup> By contrast, simple information processing appears to depend much less on active self-regulation.<sup>3</sup> Self-regulation skills in school settings often manifest in students' behavior, such as paying attention in class, working with others, creating quality peer relationships, and prioritizing academic and other activities.

Educational psychologists generally view self-regulation as a cyclical process that affects an individual's learning through three interconnected phases: (1) **preparatory phase**, (2) **performance phase**, and (3) **appraisal phase**. (See "Figure 1: The Self-Regulation Process" on the next page for more information.) Self-regulation is especially crucial during adolescence, a time when young people confront everyday life challenges while simultaneously experiencing intense neurological, physiological, cognitive, emotional, behavioral, and social changes. Adolescents face progressively more and consequential responsibilities and higher expectations from family, school, community, and broader society to make decisions that will

orient them toward "who they are and who they want to be," which makes the maturation of self-regulation skills necessary.<sup>4</sup>

Adolescents have an increased capacity to self-regulate compared to younger children. This increasing cognitive capacity for self-regulation during adolescence results from the continued development of **executive functions**. Executive functions are higher-order cognitive abilities and processes involving abstract thought, decisionmaking, planning, and perspective taking that make it possible to self-manage and allocate resources to achieve goals.<sup>5</sup> The core aspects of executive functions include **inhibition** (**self-control**, selective attention, and cognitive inhibition); **working memory; cognitive flexibility/set-shifting** (creative thinking, perspective taking, and quick adaption to changing circumstances); planning; and **fluency** (impulsivity and response generation).<sup>6</sup> Significant growth and structural changes of the brain during adolescence make this period a key stage for the development of executive functions.<sup>7</sup> Biological changes in the brain improve adolescents' abilities to better manage their thoughts, behaviors, and emotions. By puberty, the biological start of adolescence, brain functions reach adult-like levels.8 Brain structure and functions continue to develop, improve, and differentiate to increase the brain's efficiency and increase specialization.<sup>9</sup> The frontal lobes, home to key components of the brain that support executive functions, are among the last areas of the brain to mature following childhood.<sup>10</sup> In particular the prefrontal cortex, the front part of the frontal lobe, experiences significant growth and change in multiple regions during adolescence.<sup>11</sup> The prefrontal cortex is vital to long-term planning, metacognition, self-evaluation, and the coordination of emotion and cognition, providing further evidence of the importance of adolescence in the development of executive functions.<sup>12</sup>



Sources: Positive Psychology Program, "What Is Self-Efficacy Theory in Psychology? Definition and Examples," https://positivepsychologyprogram.com/self-efficacy/ (accessed February 7, 2019); D. H. Schunk and B. J. Zimmerman, "Influencing Children's Self-Efficacy and Self-Regulation of Reading and Writing Through Modeling," *Reading & Writing Quarterly* 23, no. 1 (2007); 7–25; B. J. Zimmerman, "Becoming a Self-Regulated Learner: An Overview," Theory into Practice 41, no. 2 (2012); 64–70; E. Panadero, "A Review of Self-Regulated Learning: Six Models and Four Directions for Research," *Frontiers in Psychology* 8, no. 422 (2017): 193–220. Evidence suggests that brain maturation and structural changes in the frontal and prefrontal cortices also link to emotion regulation, which continues to develop along with executive functions from childhood to adolescence and into adulthood. In addition to these biological changes, expanded privileges, expectations, and responsibilities given to adolescents by society provide opportunities to practice self-regulation skills, facilitate skill improvement, and strengthen related neural networks. Research shows that self-regulation and the brain systems underlying it develop linearly and gradually during adolescence and plateau during the midtwenties, a pattern that remains consistent around the world.<sup>13</sup> For additional information about how the human brain develops during adolescence, see All4Ed's report <u>Science of Adolescent Learning: How Body and Brain</u> <u>Development Affect Student Learning</u>.

## Self-regulation and adolescent decisionmaking

Research evidence shows that by the time adolescents reach age fifteen, their judgment and decisionmaking patterns differ little from those of adults when presented with hypothetical situations in a lab environment.<sup>14</sup> Adolescents also can distinguish between harmful and beneficial outcomes based on different choices they make.<sup>15</sup> Despite demonstrating these capacities in controlled settings, adolescents' ability to self-regulate remains limited at times, and multiple environmental and social variables can lead to their engagement in seemingly indefensible, self-detrimental, and/or dangerous behaviors.<sup>16</sup> These observed behaviors contribute to inaccurate stereotypes that adolescents are "irrational" and "immature" risk takers whose reasoning abilities are inferior to adults. Misunderstandings about adolescents' reasoning abilities, their brain development, and the impact of emotion and rewards on decisionmaking and self-regulation fuel these inaccurate stereotypes.

### 66 Situations in which adults deem adolescent behavior as "irrational" may result in an entirely "rational" reward for the adolescent, such as peer approval or exploration of new environments.

In many studies in lab environments, adolescents are more likely than adults to base their decisions on available evidence and facts; take time making decisions; and perform as well as or, at times, better than adults in these instances.<sup>17</sup> Real-life decisions, however, do not take place in controlled laboratory

### What Does "Rational" Mean?

What determines whether a given behavior or decision is "rational"? Rationality often is viewed with the following qualities (but not exclusively): (1) basing judgments on the set of available facts, (2) reasoning independently of emotion, (3) maximizing personal utility when choosing among a set of options, and (4) acting in congruency with the cultural norms of a majority population. These views on rationality are informed by philosophy, economics, and, to a lesser extent, psychology.

#### Sources: "The Importance of Philosophy: Rationality,"

http://www.importanceofphilosophy.com/Ethics\_Rationality.html (accessed March 14, 2019); B. Geurts, "Reasoning with Quantifiers," in Reasoning: Studies of Human Inference and Its Foundations, ed. J. A. Adler and L. J. Rips, 249–68 (New York: Cambridge University Press, 2008); "Rational," Merriam-Webster online, https://www.merriam-webster.com/dictionary/rational (accessed March 14, 2019); V. B. Shneider, "What Is It to be Rational?," *Philosophy Now,* https://philosophynow.org/issues/1/What\_Is\_It\_To\_Be\_Rational (accessed March 14, 2019).

environments that limit environmental and social influences. Research from affective neuroscience and moral psychology provides strong evidence that emotions are tied intimately to decisionmaking. How emotions influence decisionmaking, however, depends on environmental factors and past experiences for individuals of all ages, including adults.<sup>18</sup>

Situations in which adults deem adolescent behavior as "irrational" may result in an entirely "rational" reward for the adolescent, such as peer approval or exploration of new environments.<sup>19</sup> Such rewards are among the key drivers of adolescent development that the adolescent cognitive systems set up to pursue these choices. These choices may seem, and actually be, rational from the adolescent perspective because the outcomes of the choices align with adolescents' goals and perceived identities.<sup>20</sup> Certain risks that adults are less willing or interested in taking make sense from the adolescent perspective partly because adolescents' developing brain systems prioritize certain types of rewards.<sup>21</sup> Moreover, such actions may be

**66** The adolescent decisionmaking system is not broken; adolescents (individually and as a group) simply consider different value attributes and weight those attributes differently than adults. advantageous developmentally for adolescents because the risks associated with certain behaviors provide experiences. "The adolescent decisionmaking system is not broken; adolescents (individually and as a group) simply consider different value attributes and weight those attributes differently than adults."<sup>22</sup> It is essential that educators understand decisionmaking from the perspective of adolescents to reconsider and temper their own interpretation and inform their responses to adolescent behaviors. For additional information about adolescent risk taking and rewards, see All4Ed's report <u>Science of Adolescent</u> <u>Learning: Risk Taking, Rewards, and Relationships.</u>

## How developmental and environmental factors affect adolescent self-regulation

Developmental and environmental factors such as physical health, access to nutritious food, a sense of safety and support, mindset, and opportunities to practice self-regulation skills can support or interrupt adolescents' abilities to self-regulate.<sup>23</sup> Studies show that being in a supportive, safe environment that respects adolescents' ideas and efforts boosts students' confidence in their abilities to learn and allows them to devote more brainpower and attention to tasks in front of them. Additionally, to self-regulate effectively adolescents must perceive that their learning environment is a place where teachers and adults encourage respect for ideas and discourage students from mocking classmates.<sup>24</sup>

By contrast, unhealthy levels of stress disrupt the self-regulatory process in the brain. Evidence suggests that the adolescent brain may be more susceptible than the adult brain to stress because brain regions involved with self-regulation—such as the prefrontal cortex, emotion-processing systems, and other related neural circuitry—are experiencing hormonal changes and ongoing structural developments.<sup>25</sup> Unhealthy stress levels negatively impact the ability to pay attention to nonstressful stimuli, to remember information and concepts, and to respond appropriately to other social stressors. For more information about how stress affects adolescent learning and development, see All4Ed's report <u>Science of Adolescent Learning: Valuing Culture, Experiences, and Environments</u>.

### Why the Science of Adolescent Learning Matters for Education

Adolescence is a time of transition characterized by rapid physical, neurological, cognitive, and socioemotional development.<sup>26</sup> As students move toward adulthood, their bodies and minds change.<sup>27</sup> Those changes affect how they learn and, likewise, should influence how educators work.

A broad range of factors influence adolescent learning and development. These include *physiological* and *cognitive* factors, such as the maturation of neural pathways in the brain and the capacity to solve complex problems; *psychological* factors, such as the development of individual identity independent from parental figures; and even differing, sometimes conflicting, *cultural* and *societal* expectations.<sup>28</sup> Consequently, rather than being a time of deficit, adolescence is a period of immense learning and opportunity.

Research about adolescent learning and development draws from a variety of disciplines including, but not limited to, neuroscience, cognitive sciences, psychology, sociology, cultural studies, and medicine. By drawing from these multiple disciplines, the science of adolescent learning synthesizes what researchers know about adolescent learning and development and challenges traditional thinking about what it means to teach and learn during this developmental period. Furthermore, it offers a body of evidence that goes beyond simply observing students in the classroom and making assumptions about their learning and the strategies that support student needs. It provides a scientific understanding about how adolescents learn that can, and should, influence the approach to education reform.

Early childhood education benefited dramatically from efforts to increase educator and public knowledge about the importance of the early years of life for brain development and learning.<sup>29</sup> Now educators, policymakers, and the public generally understand that quality education during early childhood can have lasting positive effects long into adulthood.<sup>30</sup> Similarly, recent evidence shows that adolescence represents a second critical window for human learning and development.<sup>31</sup> Consequently, education leaders have a responsibility to ensure that education systems align with research about adolescent learning and development. Meanwhile, numerous studies show that physical exercise has a positive effect on executive functions, particularly on inhibition, which is an essential component of self-regulation.<sup>32</sup> Higher levels of aerobic activity are associated with improved structure in the prefrontal cortex, suggesting that aerobic exercise may help maintain or promote healthy frontal brain areas and executive functions. Conversely, low levels of blood glucose result in "a shortage of fuel for brain activities," which affects self-regulation by depleting self-control.<sup>33</sup>

While the ability to self-regulate depends partly on biological and developmental factors, students' beliefs about themselves, their motivations, and their social supports also affect selfregulatory skills.<sup>34</sup> Adolescents who believe, or are led to believe, that they have limited self-regulatory abilities, such as selfcontrol, are less likely to self-regulate successfully. That means that in some cases poor self-regulation results from adolescents' beliefs about their self-regulatory abilities rather than from limited capacity for self-regulation or actual exhaustion in attentive tasks. Conversely, adolescents who believe, or are led to believe, that their self-control resources are plentiful and regenerative are more likely to self-regulate successfully.35 Additionally, adolescents' self-regulatory abilities can improve by reframing short-term and long-term rewards to show the benefits of delayed gratification.<sup>36</sup> Behavioral and neuroimaging data shows that comparing and contextualizing rewards can promote self-control in adolescents without requiring them to expend additional willpower.37 For additional information about how motivation and relationships support self-regulation, see All4Ed's report Science of Adolescent Learning: Risk Taking, Rewards, and Relationships.

To develop executive functions and self-regulation, adolescents must encounter situations that allow them to practice the different cognitive skills involved in these processes.<sup>38</sup> As their cognitive control systems gradually mature, adolescents learn to coordinate competing environmental and social influences, even in emotionally arousing situations.<sup>39</sup> The changing dynamic of relationships with peers and adults and the increased independence adolescents experience provide new settings and opportunities for adolescents to prepare for the demands of adult life and build their abilities to self-regulate.<sup>40</sup> Parents and teachers can help adolescents build and practice self-regulatory skills by listening, offering support and guidance, and allowing adolescents to learn from their own successes and mistakes.<sup>41</sup>

### **Exploring Meaning and Purpose**

SAL Research Consensus Statement 18: For adolescents, social and emotional development involves exploring meaning and finding purpose; sometimes this development is at odds with institutional structures and expectations.

Two key social and emotional developmental tasks of adolescence that drive learning are exploring a sense of meaning and finding purpose. Adolescents increasingly are motivated to engage in activities that align with and provide further opportunities to explore their own meaning and purpose. The definitions of these two terms often are used interchangeably in daily life and by researchers in ways that muddy their distinctions. Meaning refers to "the sense and extent to which an individual sees significance or direction in their [sic] life and the level of importance a part or moment of life may give to the individual."42 Purpose here refers to "a long-term, forward-looking intention to accomplish aims or goals that are personally relevant to the self and often deemed as of consequence to the world beyond the self."43 Researchers find sense of meaning and purpose to be correlated, even though the concepts are distinct conceptually and operationally.<sup>44</sup> To some degree, purpose is considered a component of meaning.

## 66 [H]aving purpose is having an overriding commitment. This commitment provides a sense of deep stability in one's life.

Meaning addresses the question "Who am I?" by extracting significance from life events. This is both an act of personal insight and a culturally driven process. The views on morality, individual roles, and social norms of a culture as well as the expression and interpretation of these views by individuals in one's social sphere influence how people emphasize and extract meaning from the moments in their lives. Meaning making is most linked to memories that express some form of tension or conflict. When older adolescents are asked to recall "self-defining memories," their memories follow familiar plot trajectories of athletic and academic triumphs and failures, relationship beginnings and ends, and family disruptions and illnesses. The lessons drawn from their experiences about hard work, love conquering all, or growth through adversity reflect both their personal insights and the sociocultural context.<sup>45</sup> For adolescents, many of these "self-defining memories" connect to school contexts, such as relationships with peers and educators or classroom and

extracurricular experiences. The capacity for making integrative meaning of one's experiences continues to emerge more powerfully into and throughout adulthood.<sup>46</sup>

# 66 [I]dentity development is not simply a process of understanding the self; it is a developmental process that requires the approval or recognition of others to give it value or meaning.

Purpose answers a different question: "Why am I?" Young people express purpose differently than adults do. Adolescents express their other-oriented aspirations in grandiose and intense ways, much the way children with a new physical skill parade it flamboyantly for all to view.<sup>47</sup> Purpose provides a direction and well-reasoned goals that help adolescents experience heightened happiness and improve their motivation to learn. When young people explore personally relevant goals, they engage in important work that can consolidate their sense of self and ease their transitions into adulthood. When these goals extend beyond themselves into the world, adolescents realize that their lives matter and that people count on them to succeed in school and, ultimately, in life.<sup>48</sup> Purpose develops through four phases as young people grow from early adolescence into early adulthood: (1) orienting toward empathy, (2) envisioning roles they can assume in society, (3) reevaluating values and priorities through challenging life transitions, and (4) developing a pathway that enables them to realize the role they envisioned.49

## Meaning, purpose, and identity development

Meaning and purpose are central to adolescent identity development. **Identity** is a continuously evolving concept of the self that strives for a level of consistency over situations and across the lifespan and provides an understanding of how the self is constructed and situated in different social or physical settings.<sup>50</sup> This "self" is informed by the compilation of a person's qualities, beliefs, aspirations, looks, or expressions as they relate to and are perceived by other individuals and groups.<sup>51</sup> **Identity development** involves exploring new experiences and environments to negotiate an understanding of one's identity.

The importance of how adolescents perceive themselves and what they value in their identities may affect self-regulation and other motivated behaviors, such as learning. Adolescent identity development centers on the questions "Who am I?" and "How am I perceived by the world around me?" and prepares adolescents to navigate their current world and the world they will face as adults.<sup>52</sup> It is a process to fashion a self that is continuous across changing and unanticipated times, situations, and relationships to provide a sense of inner sameness. This adolescent identity development process consolidates ideological beliefs, career goals, and life aspirations, and explores sources of meaning during adolescence and into adulthood. Connecting academic learning experiences to adolescents' own identity development can raise the value of those experiences for students, increasing the likelihood that they will remember what they learned and motivate them to advance their learning in those areas.

To understand why meaning and purpose are key to identity development requires understanding the identity development process. Identity development consists of a series of progressive changes driven by a three-part process: (1) in-depth exploration, (2) commitment, and (3) reconsideration.<sup>53</sup> In-depth exploration depends on adolescents examining their devotion to different people, causes, and aspects of their identity; reflecting on their choices; looking for new information; and talking with others about these devotions. Commitment refers to the choices adolescents make to their broader identities or specific aspects of those identities and the extent to which individuals identify with their choices. Adolescents enter identity formation with a set of commitments to ideological and interpersonal identity groups they usually receive from their parents, others in their immediate social circles, and broader society. The adolescent then chooses whether to keep these commitments or change them.<sup>54</sup> The choices can be both explicit and implicit and depend on expectations in the respective culture(s) to which the adolescent belongs. Reconsideration refers to the comparison between current commitments and other possible alternatives and efforts to change present commitments.<sup>55</sup> Cultural context may increase or decrease the ability to forgo, take on, or revise certain commitments.56

Biological and neurological developments drive the identity development process. Identity is made up of meaning-filled and self-defining experiences.<sup>57</sup> Seeing meaning in life events is necessary as a person constructs what researchers call a **narrative identity**—"a person's internalized and evolving life story that integrates the reconstructed past and imagined future to provide life with some degree of unity and purpose."58 Equating identity development to a narrative goes beyond a metaphorical comparison; identity development is a process of constructing a uniformed story of oneself.<sup>59</sup> The cognitive development that happens during adolescence supports this view of identity development. Autobiographical memories and prospective memory become more salient in adolescence, providing improved capacities to retain and reflect on memories that become a key part of the life story. Adolescents can think more abstractly about the temporal and causal ordering of human events. For example, it takes until midadolescence before most youth can reason about how events and experiences depicted in a story relate to changes in the story's protagonists.<sup>60</sup> Cultivating a sense of purpose in life can be a strong mechanism through which a stable identity contributes to well-being.<sup>61</sup> In another sense having purpose is having an overriding commitment. This commitment provides a sense of deep stability in one's life.

Although it is unclear whether a strong sense of identity helps one see meaning and purpose or whether having meaning and purpose solidifies identity, a strong relationship exists between identity, purpose, and meaning. Consequently, it is important for adolescents consciously to explore meaning and purpose along with their identity development.<sup>42</sup>

## Connecting meaning and purpose to societal goals and expectations

Purpose and meaning in adolescents' lives often conflict with the world around them. Adolescence frequently represents a time when young people encounter conflicts with parents and other authority figures such as teachers. The conflict that emerges during this time broadens to include adolescents' extended family, peers, communities, and larger society as external pressures push adolescents to situate themselves in culturally approved roles and behaviors.<sup>43</sup> An adolescent who conforms to culturally approved roles and behaviors, such as excelling in school, often receives positive recognition from people in the same cultural group, which acknowledges the adolescent as a member of that group.<sup>64</sup> In many cases, this is a necessary and appropriate struggle. It ensures that certain goals or purposes that do not benefit the group do not emerge and are not approved culturally during adolescent development. It also

ensures that adolescents connect the meaning and purpose in their lives to the well-being of the group. However, for many adolescents, aligning personal identities with the expectations of society is difficult. Identity demands recognition. Consequently, identity development is not simply a process of understanding the self; it is a developmental process that requires the approval or recognition of others to give it value or meaning.<sup>45</sup>

### [A]dolescence is a unique and critical time for identity development because of the biological and social changes occurring in the body, brain, and adolescent world.

Increasingly, though, recognition alone is not enough, particularly for groups who have experienced past or current discrimination.<sup>66</sup> Identity development and finding meaning and purpose cannot exist outside a cultural context because a culture provides meaning for the person and for others.<sup>67</sup> For historically underserved students, though, the larger society in which they live often rejects, demeans, or ignores the identity groups to which they belong. The issues, concepts, and materials discussed in their course work do not recognize or respect the history and contributions of these identity groups. For healthy meaning making to occur in identity development, public affirmation of the equal dignity of formerly or currently marginalized groups, including African Americans; women; indigenous peoples; and members of the gay, lesbian, bisexual, transgender, and questioning/queer communities must occur.68 The inability of public institutions, including schools, to reflect the history and values of these individuals constricts students' abilities to see meaning in their course work, self-regulate, and focus on academic pursuits.

Adolescents' learning environments often focus on instrumental purpose—meaning students' sense of purpose solely as part of their academic pursuits. The message many adolescents receive is that they simply need to pursue their education to prepare for college and a career. But while this message may resonate with some adolescent students, particularly those who identify as "academics," for many students academic achievement alone does not provide a satisfying purpose. The benefits of identifying an individual purpose that students then connect to their academics are well documented.<sup>69</sup> In studies involving roughly 2,000 high school and college students, a purpose for learning improves students' abilities to self-regulate in both the short and long term. Meanwhile, a separate set of studies

finds that having a self-transcendent purpose may help urban students of color from low-income families better self-regulate and persist in college. For example, helping students identify a self-transcendent purpose for their learning doubles the time they spend on exam review questions and increases the number of math problems students solve by 35 percent, even when students have the option to use entertaining internet media at any time.<sup>70</sup> Adolescents with a personally important and selftranscendent purpose view learning tasks differently and are more willing to complete tedious tasks.<sup>71</sup>

Adults and peers help adolescents develop their own purpose and sense of meaning. Adults can model ways to contribute to society and invite adolescents to participate in related activities. In late adolescence, young people who maintain strong family support structures see sustained purpose in their lives, leading some researchers to speculate that either (1) a commitment to family helps young people develop purpose or (2) adolescents who have a strong sense of purpose in their lives find new ways to express it during the transitions happening during adolescence.<sup>72</sup>

Research shows that both peers and adults can help adolescents discern meaning from key life moments and incorporate them into a larger life narrative by conversing with them about these moments. But the quality of the conversation, with whom it takes place, the reason for sharing the memory, and the listener's behavior and relationship influence the effectiveness of these conversations. Stories that engage adolescents in self-reflection, such as those about relationships and achievements, are more effective in meaning making than stories focused on entertainment, minor injuries, adventures, or escapades. Attentive and responsive listeners cause tellers to narrate more personally elaborated stories compared with distracted listeners. Furthermore, when important people in adolescents' lives affirm the value and agree with the interpretation of personal stories, adolescents are likely to hold on to that story and incorporate it into their general understanding of who they are and how they came to be.73

66 It may be that identity development during adolescence intertwines what others think about an individual with what individuals think about themselves, even on a neural level, emphasizing the important role of social influences on identity development.

### The Crucible of Identity Development

SAL Research Consensus Statement 19: Adolescents are developing their own adult identity, trying to understand their roles and contributions in social contexts and communities. This identity development continues into adulthood, as the individual has more diverse experiences.

While an individual's identity develops throughout childhood, and continues to evolve into adulthood, adolescence is a unique and critical time for identity development because of the biological and social changes occurring in the body, brain, and adolescent world.<sup>74</sup> Identity is a product of the growing neurocognitive capacities that allow adolescents to recognize themselves in the present moment, reflect deeply on their past, and project visions of themselves into the future. At the same time, adolescents' identities are shaped by interactions with their immediate social circles, broader society, and culture in which they live. The challenges, expectations, and norms that adolescents experience, particularly those presented by key figures in their lives, influence their development. Identities form partly based on how society views, assigns, and treats individuals and how individuals respond to these categorizations. In these ways, identity development is both a biologically and socially driven process.

Like people at other stages of life, adolescents are affected by the environments around them, but they also have reached a stage where they can select, create, and change their contexts and influence the environments in which they live.75 Adolescence is a time in which individuals are highly perceptive of and hypersensitive to inclusion and affiliations and vulnerable to social influences, particularly involving their peers. As individuals enter adolescence, they are better equipped neurologically to consider how their identities relate to or differ from those of their parents, their immediate social circles, and segments of broader society.<sup>76</sup> From a young age, humans develop and demonstrate the notion of a self-concept or selfperception and the ability to differentiate between the "self" and "others." During adolescence, self-concept evolves to include a social self-concept or "an individual's perceptions of how others perceive them [sic]."77

The combination of biological and social changes around or at the onset of puberty accompanies the enhanced ability to selfevaluate during adolescence.<sup>78</sup> Brain development contributes to unique behaviors found in adolescence, such as heightened self-consciousness and the increase in peer influence.<sup>79</sup> In early adolescence (around ages seven to nine), children begin using social comparisons to inform lasting self-evaluations. This change leads to questions such as "What do others think about me?" and "Where do I fit in?"<sup>80</sup> This questioning also leads to elevated self-consciousness and what some researchers have coined as the **imaginary audience**—a disillusioned perception that the attention and judgment of others focuses on an individual to a higher degree than they actually do.81 The development of the prefrontal cortex and other brain systems enables a host of other abilities to refine or emerge during adolescence. This includes the development of perspective taking, the ability to take on the viewpoint of another person; mentalizing, the ability to understand others' thoughts, desires, intentions, and feelings; the ability to process information, including improved facial recognition; and metacognition, the ability to reflect on one's own thoughts and behavior.82

Adults and adolescents enact different brain systems when they self-evaluate or think about their self-concepts. Adults rely more on regions of the brain dedicated to memory retrieval to answer auestions about themselves, while adolescents use several brain regions devoted to higher-order cognitive thinking, such as the prefrontal cortex.<sup>83</sup> This difference may occur because adolescents actively and constantly reconsider aspects of their identity while adults establish self-concept based on past experiences.<sup>84</sup> This constant reconsideration emphasizes the importance of experiences, particularly meaningful experiences, in shaping identity. Brain scans show that adolescents engage multiple regions during moments of self-appraisal that overlap with some used when taking on the perspective of peers or parents. Adults do not show this brain activation.85 It may be that identity development during adolescence intertwines what others think about an individual with what individuals think about themselves, even on a neural level, emphasizing the important role of social influences on identity development. These changes in regional brain activation for self-evaluation during adolescence are thought to support the development of stable personal identities.86

## The role of identity groups in adolescent identity development

Identity development involves the integration of multiple identities that emerge from the adolescent's experiences in different settings, in performing different roles, and from being associated with a particular social category or social group, either by self-selected affiliation or forced classification. Examples of such groups include, but are not limited to, assigned and identified ethnic group(s), gender identity and biological sex, sexual orientation, nation(s) of residence, cultural heritage, socioeconomic status, and religious affiliations (or lack thereof). When individuals reach late adolescence, increased cognitive functions and independence allow them to recognize the different identity groups with which they associate and construct an integrated, overarching identity. Adolescents begin to arrange their entire lives into an emerging story that ties together their many different aspirations and roles into a meaningful narrative.<sup>87</sup> While the process of identity development considers the broad question of "Who am I?," the consideration of identity groups leads to further questions, such as "What does it mean to be African American?," "What does it mean to be bisexual?," or "What does it mean to have Irish heritage?"88 All these questions are a search to acquire an optimal understanding of identity groups.<sup>89</sup> This identity development is at the core of adolescents' social and emotional development.<sup>90</sup>

### 66 Healthy identity development occurs when adolescents have high self-esteem, opportunities to explore and commit to different aspects of identity, and supportive environments in which to explore their emerging identities.

Identity groups are social constructs that have cultural components, since culture is part of the process that affects the development of identity groups. While certain biological aspects of an individual, such as sex or skin color, inform the identity groups with which an individual associates, research shows that the classification of identity groups does not indicate a biological or genetic difference in cognition or abilities. For example, when looking at multiple groups of people from different geographic origins, most of the genetic variation that exists is *within* populations, not *between* them, with roughly 90 percent of human genetic diversity existing within a single population or people.<sup>91</sup> Even with the most distinct populations, individuals frequently are more similar genetically to members of other populations from other areas than to members of their own population from their own geographic area.<sup>92</sup> This type of research showcases the inaccuracy of claims throughout history that different groups of people have genetic or biological differences that would serve as the basis for differing abilities between identity groups.

Variance in racial categories over time and in different areas around the world offers further evidence about how identity groups are constructed culturally. Individuals who classify themselves as "white" in Brazil often are considered "black" in the United States. In the United States, the classification of some mixed-race individuals as "black" or "mulatto" varied throughout the nation's history and political environment. Many other countries use similar or identical racial terms in highly inconsistent fashions.<sup>93</sup>

During adolescence, individuals attempt to commit to and negotiate the values of their disparate identity groups, a process called identity integration.<sup>94</sup> While integrating these disparate identities, adolescents must negotiate the values of their identity groups with those of the broader society to which they belong.<sup>95</sup> Individuals in a specific identity group typically share a broad range of beliefs and behaviors with other members of that group; however, not all members of an identity group hold uniform beliefs and engage in identical practices.<sup>96</sup> Furthermore, different identity groups can and often do overlap in ways that can change the way individuals perceive or emphasize other aspects of their overall identity. Research shows that in a diverse nation like the United States, it is important for all students, including adolescents, to preserve the values of their different identity groups while simultaneously adopting the shared values of the larger society. This identity integration cannot occur effectively, however, unless the host society is accepting and inclusive, rather than discriminatory or rejective of inclusive efforts.97

Adolescents have varying levels of success integrating identities. The identity integration process is important for young people who associate with minority and majority identity groups. However, the process of negotiating their identities tends to be more explicit and potentially more challenging for individuals who associate with minority identity groups, particularly those that are marginalized and/or stigmatized. This results from potential incongruities of values or life experiences between minority and majority groups. Adolescents who are part of a majority identity group still must negotiate aspects of their identity, but the process tends to be less explicit because the values of their majority group likely represent the dominant values of the society in which they live. An exception to this is when adolescents of a majority group are exposed explicitly to other groups, either in person or through media.<sup>98</sup> A lack of explicit identity negotiation may lead to challenges for those in a majority identity group, such as being ill-prepared to navigate circumstances or scenarios involving diverse sets of individuals.

Through advances in transportation and computing technologies, today's adolescents socialize physically and virtually with other populations they previously would not have accessed and connect with a wider group of individuals with shared interests or values.<sup>99</sup> Consequently, individuals have greater opportunities to compare their own lives against those of others and explore identity groups that previously would have been inaccessible. Access to these new opportunities and social channels, however, has not been equitable, particularly



Photo by Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action

for adolescents from historically underserved communities who experience limited access to technology. The implications for adolescents with newer physical and virtual socialization channels, and for those without them, still are being explored. At the same time, American cities and schools remain, at the very least, as segregated as they were before the U.S. Supreme Court's 1954 ruling in *Brown vs. Board of Education* that declared segregated schools unconstitutional. Different trends, such as integration within cities, segregation between cities, growing diversity of the U.S. school-age population, and policies on vouchers and charter schools, all contribute to higher and lower levels of integration.<sup>100</sup>

Identity groups have political, social, and economic ramifications that affect the development of adolescents. Poor identity integration, as well as stereotype threats toward members of identity groups, can lead to academic performance deficits and negative mental health consequences, such as a disengagement and lack of belonging, when individuals undertake difficult tasks in domains where they perceive their group as negatively stereotyped.<sup>101</sup> Conversely, healthy identity integration and adolescents' positive attitudes toward the identity groups with which they associate boost selfesteem and lower stress levels, which contribute to improved learning for adolescents.<sup>102</sup> Healthy identity integration can contribute to enhanced creativity or the ability to come up with novel, relevant solutions to problems, particularly problems pertaining to issues related to an individual's identity group(s).<sup>103</sup> Furthermore, individuals who associate positively with their identity groups and successfully integrate their various identity affiliations may be better equipped to draw from different ideas and perspectives, especially in diverse group settings.<sup>104</sup> This is important for all adolescents, especially those from historically and currently marginalized groups who have dealt with bias or prejudice that may negatively influence self-perception of ability or intelligence.

Healthy identity development occurs when adolescents have high self-esteem, opportunities to explore and commit to different aspects of identity, and supportive environments in which to explore their emerging identities.<sup>105</sup> Adults can support adolescents and their identity development by allowing adolescents to take risks, explore new interests, commit to those interests, and reconsider who they want to be. Peer dialogue and adult exchanges support the formation of adolescents' abilities to ''tell'' who they are, both to others and to themselves.<sup>106</sup>

### Adolescents' Desire for Agency

SAL Research Consensus Statement 20: Adolescents seek opportunities for agency where they can decide how they spend their time and influence policies and practices of institutions that shape their lives.

Adolescents' personal identity development, association with multiple identity groups, hypersensitivity to social interactions, and increased cognitive skills, such as self-regulation, can contribute to their growing desire to understand and influence the complex social structures that govern their lives. The development of agency pushes adolescents to use their greater understanding of social systems to influence the way institutions affect their lives.

Agency is the ability to generate self-directed actions that control the individual and the course of events in the environment.<sup>107</sup> It has attitudinal, emotional, and functional qualities and requires a voluntary action and outcome that provides the feeling of causing something to occur.<sup>108</sup> Agents individuals who have agency—assume some degree of ownership and control over both themselves and aspects of their environment. They are the sources of self-initiated actions that impose their own internal desires into external plans of action in the world.<sup>109</sup> Adolescents' increasing abilities to self-regulate, search for meaning and purpose, and develop identity all contribute to an evolving sense of agency. Agency is, in many ways, a defining feature of selfhood and is associated in some cultures with high self-reliance in adolescence.<sup>110</sup>

Humans experience agency both at an implicit and an explicit level. The implicit level, sometimes referred to as a "feeling of agency," consists of subconscious, **sensorimotor processes** often dealing with the ability to direct and control one's own body. The explicit level, also called a "judgment of agency," is associated with higher-order thinking abilities and conscious, selfdirected thoughts focused on creating expressed changes in the surrounding environment.<sup>111</sup> The implicit level of agency largely goes unnoticed by individuals who have experienced typical motor function development during childhood. The exception to this is when a momentary or long-term mismatch between a person's premeditated action or expected movement and an actual outcome creates a sense of incongruency. This includes involuntary body movement (e.g., tremors, tics), externally directed body movement (e.g., being physically restrained and moved by other people or outside forces), and loss of body control due to diseases (e.g., ataxia) or injury.

### How adolescents develop agency

The cognitive foundations for agency in adolescence, and ultimately adulthood, develop throughout childhood. During infancy, agency development largely centers on the observation and understanding of causal relationships in surrounding environments and learning how to control personal body movements.<sup>112</sup> As infants enter early childhood, they master the basic language functions and ability to imagine objects that are not in their immediate vicinity (called symbolic representation).<sup>113</sup> In late childhood, before adolescence, children improve self-regulation, plant the seeds for identity development by better distinguishing themselves from others, express unique individual traits, and establish and evaluate personally aligned goals.<sup>114</sup>

Agency's cognitive foundations progress further during adolescence with the continued development of the frontal lobe and prefrontal cortex. The development of these areas allows adolescents to think more abstractly and piece together evidence about human systems and institutions. Adolescents have developed the ability to communicate and adapt messages strategically to influence different audiences. This ability is based in their increased perceptions of others' mental states, improved meta-memory skills, hypersensitivity to social situations, and reasoning skills.<sup>115</sup> Two core parts of the development of agency are (1) **self-efficacy**, meaning faith in one's efforts, not only in one's abilities, and (2) life expectations, referring to beliefs about one's future.<sup>116</sup>

In addition to cognitive development, changes in adultadolescent relationships serve as a launching point for adolescent agency development. Adolescents seek increased independence from adults, particularly parents and guardians, through healthy levels of personal autonomy. This healthy autonomy involves connectedness and separation from parent/guardian figures. **Connectedness** describes close parentadolescent relationships, characterized by mutual reciprocity, trust, and dependency. **Separation** refers to increased distance between adolescents and their parents that involves decreased dependence on parents when encountering problems and seeing parents as imperfect or not absolute authority figures, a process known as **deidealization**.<sup>117</sup> Separation is a stepping stone toward developing personal autonomy and agency but should not be confused with **detachment** (feelings of disengagement from parents due to feelings of mistrust and alienation), which may be a sign of an unhealthy relationship.<sup>118</sup> This balance between separation and connectedness varies across cultural groups and defines social development of adolescent agency.<sup>119</sup>

### Ways to demonstrate agency

The most common mode for agency, both colloquially and in scientific studies, is the self. When an individual affects an outcome through self-directed voluntary action, it is called personal or individual agency. For example, when a high school student has the freedom to choose two hours of elective studies and signs up for French and engineering, the student takes selfdirected voluntary action (selecting two courses) to change the student's environment (class schedule).

At times, an individual's ability to exercise agency may be limited, as people often lack direct control over the systems and institutions that govern their lives. Achieving a desired outcome may be beyond an individual's skill range, require another individual with the correct skills, or be too difficult for an individual to achieve alone. For example, individuals who are part of a disenfranchised or minority group may need collective efforts to strengthen their voice and achieve a desired institutional change. Humans are incredibly social, and many of the outcomes sought are achievable only through cooperative efforts. In these cases, individuals move beyond personal agency and use social mechanisms to expand into two different forms of agency: proxy agency and collective agency.<sup>120</sup>

**Proxy agency** exists when individuals seek to alter their environment through other individuals who have expertise, influence, and/or power to represent them or achieve their desired outcomes.<sup>121</sup> Voting, for example, is a type of proxy agency. By exercising the voluntary action of voting, individuals choose a proxy (a representative) who exhibits control over their environment (public policy). **Collective agency** occurs when a group of individuals with shared beliefs exercise their combined power to produce desired results. Reaching these desired results is a product of combined knowledge, resources, and skills and the presence of interactive and coordinated efforts.<sup>122</sup> Advocacy and civil rights groups, for example, leverage collective agency by pooling the resources, skills, and knowledge of the individuals who belong to their organizations and the groups they serve. Individuals also may turn to proxy or collective agency to limit the stressors of individual responsibility and potential repercussions resulting from personal agency.

Adolescent agency development is defined by the expansion of personal agency to include more complex modes, such as proxy and collective agency. Civic engagement, fostered both in and outside of school environments, is one way to increase adolescent agency; however, such opportunities are not distributed equitably.<sup>123</sup> Research on broader youth activism shows that with proper support adolescents can foster a strong sense of agency that allows them to identify collective and large-scale actions to impact people and institutions.<sup>124</sup> Participating in social justice campaigns helps adolescents learn how to interact and influence systems, recognize institutional structures, understand the challenges of enacting collective agency, and interpret human behavior.<sup>125</sup> Acquiring this new knowledge allows youth to design solutions and effectively influence these systems for the outcomes they seek.<sup>126</sup> There also appears to be a bidirectional relationship between identity and civic engagement: identity promotes civic participation, which stimulates achievement of firmer identity.127

Early adolescents' beliefs about their level of agency affect school adjustment. If students place faith in their own efforts, rather than their abilities, they adopt a mindset that can improve school adjustment substantially.<sup>128</sup> Even the perception of having agency improves education outcomes, which, in turn, lead to greater opportunity for agency beyond adolescence.<sup>129</sup> Having agency improves adolescent health and well-being, and individuals who view themselves as agents enjoy higher levels of mental health and maturity, and greater life satisfaction.<sup>130</sup>

### Implications and Opportunities for Education Practice and Policy

Identity and agency development are core aspects of adolescence influenced by changes in the brain and social environment during this stage. Adolescents need opportunities to explore different aspects of their identities and to exercise the different social and cognitive tools that allow them to be successful agents. Educators must consider how they shape learning environments and practices in ways that develop identity and agency. By understanding the science behind these different social and cognitive tools, educators can support adolescent students as they integrate and explore different aspects of their identities and build their abilities as agents. This will increase student engagement and help close achievement and opportunity gaps.

## What do these findings mean for educators?

- It is vital that educators understand that self-regulation improves from childhood but still develops during adolescence. To foster self-regulation skills, educators must ensure that students' basic needs are met, including access to nutritious food, adequate sleep, exercise, acceptance, and feelings of safety and belonging, as these all contribute to adolescents' ability to manage their behavior. Educators should check in with students and their families regularly and intervene in cases where students have unmet needs, working within the school and with community partners.
- Guiding the development of adolescent self-regulation skills cannot be an "add-on" to the curriculum. Educators should create time and space during the school day to model, teach, and practice self-regulation with their students. Activities such as simulating, role playing, and discussing stressful moments in students' academic and personal lives can help adolescents develop self-regulatory skills. Technology can supplement these types of activities by providing video clips and vignettes that demonstrate positive and negative examples of self-regulation with specific strategies that result in positive outcomes. School personnel also can provide opportunities for students to design scenarios or share personal experiences that cause them to role-play and self-reflect on how best to regulate themselves in times of stress, anger, pain, or discomfort. During adolescence, students need opportunities to explore self-regulation as part of their natural learning, to make mistakes, and to learn from their own experiences.
- Education leaders can build time and places for parents and teachers to help adolescents through this stage of development by listening and offering support and guidance on regulating behavior rather than resorting to punitive responses.

- Meaning making is a central aspect of creating identity, so it is important for an academic environment to recognize the key issues students face in becoming their own selves. Schools should nurture the identity development of students by allowing them to explore various activities and authentic learning opportunities through which they can make meaning of the world around them. Educators can develop systemic approaches that allow for meaning making through virtual and in-person field trips, guest speakers with a wide variety of expertise and from diverse backgrounds, projects and assignments that allow students to go beyond the classroom and connect with the real world, and opportunities to share students' interests and questions about the world.
- Research and data support the integration of identity groups as a positive aspect of adolescent development. Students who see successful peers and adults around them who represent aspects of their own backgrounds and aspirations are more likely to draw connections between those individuals and their own identities. This exposure allows adolescents to envision themselves reaching certain goals, being part of a certain trajectory, and feeling confident in their own capabilities. Diversifying the educator workforce can foster positive identity development, especially among historically underserved students. However, all educators can lift up students from diverse backgrounds by teaching and mentoring in culturally responsive ways.
- For students to explore deep meaning and purpose in their school experience, educators should get to know their students' personal interests, skills, and aspirations and build academic and social experiences aligned with those interests. Leadership should model similar practices with school staff, making this approach part of the schoolwide culture to help ensure that school experiences respond to students' needs.
- Practices that isolate students for long periods of time for academic catch-up or punitive behavior management can be at odds with adolescents' social and emotional development. Adolescents seek to make sense of institutional structures around them and see how well they are accepted within them. Adults can provide conducive environments for learning and social engagement with a heavy focus on peer relationships that elevate voice and agency. One way to do this is to seek adolescent input when designing or developing systems for behavior management

and supplemental academic support. Evidence-based approaches, such as <u>restorative justice practices</u> and <u>positive</u> <u>behavior intervention support</u>, can help educators create systemic ways of engaging students in improving both their academics and behavior in developmentally appropriate ways.

### What do these findings mean for policymakers and advocates?

- Policymakers can support educators in providing opportunities for students to participate in work-based learning. Work-based learning allows adolescents to engage with their communities and learn the codified language of an industry that ultimately increases adolescents' interest in a career field. Policymakers also can promote work-based learning as well as college and career planning when implementing the <u>Strengthening Career and Technical</u> <u>Education for the 21st Century Act</u>.
- The reauthorization of the Higher Education Act (HEA) also provides an opportunity to help adolescents contextualize the importance of secondary education as it relates to their personal and professional goals and develop agency over their future. For example, to combat the notion that only some students are "college material," HEA should provide U.S. students a "Fast Track" to and through college by providing academically prepared eleventh graders, one-third of whom typically are from low-income families, the chance to enroll in a full load of college-level courses in the twelfth grade and graduate from high school with a full year of college credit. This will help students, particularly first-generation college students, feel that postsecondary education is within their reach. HEA also should give adolescents agency by allowing high school students to enroll in dual-credit and early college programs using Pell Grants to cover the cost. In addition, state accountability systems under the Every Student Succeeds Act can encourage school districts to offer college courses and provide pathways for students to earn industry credentials and obtain work experience while still in high school.
- Adolescents seek engagement in the institutions that govern their lives. Federal, state, and local policymakers should build on existing internship programs and create new youth programs that introduce students, particularly those who are underserved, to government structures; the local, state, and

federal legislative and legal processes; current policies and laws; and issue advocacy and campaigning.

- Adolescents are at a stage in which their self-regulatory abilities still are developing. The difference in developmental patterns between adolescents' self-regulatory systems and their sensitivity to emotion makes them more susceptible to poor decisionmaking. Policymakers can enact legislation that limits traditional school delinquency policy by encouraging restorative justice techniques. Policymakers also can consider reworking laws as they pertain to adolescents who have committed crimes to consider varying developmental trajectories and reduce the <u>school-to-prison pipeline</u>. For example, state and local policymakers should limit the use of juvenile court penalties and sanctions for activities and behaviors that are only illegal because the "offense" is committed by a juvenile (e.g., truancy).
- Federal funding for teacher preparation programs and preservice teacher loans should include provisions that require teacher preparation programs to train aspiring educators on adolescent self-regulation, identity development, and agency development.
- Educators should engage students in meaningful activities that connect them to the world beyond school through mentoring from business and community leaders; authentic learning and community service opportunities with community, faith, and business organizations; systems for recognizing and incentivizing the contributions of students in school and the community; an enhanced role of student government to address school and community issues; and student personalized learning plans and student-led conferences to help students be the agents for their own academic development.

### Conclusion

Neuroscience and the cognitive sciences have confirmed what psychologists and sociologists have known for decades: adolescence is the crucible for identity development and a stage in which adolescents flex their emerging social and cognitive tools to become agents of change. The development of the frontal lobe and the prefrontal cortex allows adolescents to understand abstract human systems and institutions better, reason at adult-like levels, and increase their self-regulatory abilities. The development of these cognitive abilities, along with adolescents' heightened sensitivity to social evaluation and their propensity to form deep peer relationships, support their identity development as they become more aware of the identity groups to which they belong and that actively shape their identities.

At the core of identity development is the exploration of purpose and meaning and the integration of identity groups. Both processes direct adolescents toward how they want to influence institutions that shape their lives. Adolescents need time to selfreflect and build healthy relationships to explore the purpose and meaning of their lives. They also need opportunities to learn about how institutions work and to practice the social and cognitive skills that allow them to be change agents. Without close relationships with adults and peers, time for reflection, and opportunities for practice, adolescents will be unable to maximize their agency and experience healthy identity integration.

Policymakers and educators should provide students with work-based and service-learning opportunities, experiences to learn about government structures and ways to advocate for change, and college-preparatory pathways that allow students to take charge of their own learning. These opportunities will help students make meaning of their lives, connect their learning to the real world, and promote their sense of agency. Government, district, and school leaders can do this by funding in-school and out-of-school programs that expose students to these different institutions and by structuring schools in ways that elevate student voice and empower adolescents to participate in school governance. School and district leaders also should ensure that curricula and instructional materials recognize the contributions and accomplishments of a variety of identity groups so students from historically underserved groups see meaning in their course work and academic pursuits.

State, district, and school leaders should acquaint themselves with the self-regulatory process and provide students with opportunities for self-reflection. Students need opportunities to practice self-regulation and engage in meaningful conversations with trusted peers and adults about their emerging identities.

### **Endnotes**

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### Glossary

agency. The state of being active, usually in the service of a goal, or of having the power and capability to produce an effect or exert influence. There are two types of agency: (1) body agency refers to control over one's body, and (2) external agency refers to control over changes in an individual's environment. Individuals who have agency are called agents.

appraisal phase. The third phase of the self-regulatory process, in which the student reflects, regulates, and adapts following actual task completion. See also preparatory phase and performance phase in Glossary.

autobiographical memories. A person's memory for episodes or experiences that occurred in his or her own life. Often the terms autobiographical memory and episodic memory are used interchangeably. However, autobiographical memory can consist of information stored in episodic memory (i.e., events experienced at a particular time and place), semantic memory (i.e., knowledge of general facts and concepts that give meaning to information), or a mix of the two.

**cognitive flexibility**. The capacity for objective appraisal and appropriately flexible action. Cognitive flexibility also implies adaptability and fair-mindedness. Also called *set-shifting*.

**collective agency**. When a group of individuals with shared beliefs exercise combined power to produce desired results.

**commitment**. Obligation or devotion to a person, relationship, task, cause, or other entity or action; refers to being committed to one's choice of identity.

**connectedness.** Close parent-adolescent relationships, characterized by mutual reciprocity, trust, and dependency.

**deidealization**. The process of seeing parents as imperfect or not absolute authority figures.

**detachment**. Refers to an adolescent's feelings of disengagement from parents due to feelings of mistrust and alienation.

executive functions. Basic cognitive processes, such as attentional control, cognitive inhibition, inhibitory control, working memory, and cognitive flexibility. Higher-order executive functions require simultaneous use of multiple basic executive functions and include planning, reasoning, and problem solving. These functions frequently are associated with neural networks that include the frontal lobe, particularly the *prefrontal cortex* (see Glossary for definition).

**fluency**. The ability to generate ideas, words, mental associations, or potential solutions to a problem easily and rapidly. Fluency usually is considered an important dimension of creativity.

identity. An individual's sense of self, defined by (1) a set of physical, psychological, and interpersonal characteristics that are not wholly shared with any other person, and (2) a range of affiliations (e.g., ethnicity) and social roles. Identity involves a sense of continuity or the feeling that one is the same person today that one was yesterday or last year (despite physical or other changes). Such a sense is derived from one's body sensations; body image; and feeling that one's memories, goals, values, expectations, and beliefs belong to the self.

identity development. Development of the distinct personality of an individual regarded as a persisting entity in a particular stage of life in which the individual possesses characteristics by which the person is recognized or known. Also known as *identity* formation.

identity groups. Key facets of *identity* (see Glossary for definition) such as gender, social class, age, sexual orientation, race, ethnicity, religion, age, and disability.

identity integration. A commitment to and combining of evolving identity groups (see Glossary for definition) to reach a totality of the self. Identity integration involves accepting the unfolding identity (see Glossary for definition), its continuity over time and settings, and a desire to be known by others as such. **imaginary audience.** The belief of an adolescent that others constantly are focusing attention on that specific individual and scrutinizing behaviors, appearance, and other characteristics. The adolescent feels like the central topic of interest to a group of spectators (i.e., an audience) when in fact this is not the case. The notion of an imaginary audience is an early adolescent construct reflective of acute self-consciousness and considered an expression of adolescent egocentrism.

**in-depth exploration**. Represents the extent to which adolescents actively explore current commitments, reflect on their choices, search for additional information about these choices, and discuss their current commitments with relevant others such as friends or family.

inhibition. The process of restraining one's impulses or behavior, either consciously or unconsciously, due to factors such as lack of confidence, fear of consequences, or moral qualms.

meaning. The cognitive or emotional significance of a word, sequence of words, concept, sign, or symbolic act. This may include a range of implied or associated ideas (connotative meaning) as well as a literal significance (denotative meaning).

**mentalizing**. The ability to understand others' thoughts, desires, intentions, and feelings.

metacognition. Awareness of one's own cognitive processes, often involving a conscious attempt to control them.

**narrative identity.** A person's internalized and evolving life story that integrates the reconstructed past and imagined future to provide life with some degree of unity and purpose.

performance phase. The second phase of the self-regulatory process, in which an individual executes a task while monitoring and controlling progress. See also appraisal phase and preparatory phase in Glossary. perspective taking. Looking at a situation from a viewpoint that is different from one's usual viewpoint. This may involve adopting the perspective of another person or one associated with a particular social role, as in role play exercises. The term is synonymous with role taking.

prefrontal cortex. The most anterior (forward) part of the cerebral cortex of each frontal lobe in the brain. The prefrontal cortex functions involve attention, planning, working memory, and the expression of emotions and appropriate social behaviors.

preparatory phase. The first phase of the self-regulatory process, which includes task analysis, planning, activation of goals, and setting goals. See also appraisal phase and performance phase in Glossary.

prospective memory. Remembering to do something in the future, such as taking one's medicine later. Prospective memory contrasts with retrospective memory or remembering past events.

proxy agency. When individuals seek to influence their environment through other individuals who have expertise or wield influence and power to act on their behalf to achieve the desired outcomes.

**purpose**. The reason for which something is done or for which something exists. A mental goal or aim that directs a person's actions or behavior. Persistence or resolution in pursuing such a goal.

reconsideration. Refers to adolescents comparing their present commitments (see Glossary for definition) with possible alternative commitments.

self-concept. Self-concepts contribute to the individual's sense of *identity* (see Glossary for definition) over time. The conscious representation of self-concept depends in part on nonconscious schematization of the self. Although self-concepts usually are available, to some degree, to the consciousness, they may be inhibited from representation yet still influence judgment, mood, and behavioral patterns. Social self-concept refers to the aspects of one's identity or self-concept that are important to or influenced by interpersonal relationships and the reactions of other people. self-control. The ability to be in command of one's behavior (overt, covert, emotional, or physical) and restrain or inhibit one's impulses. In circumstances in which short-term gain is pitted against long-term greater gain, self-control is the ability to opt for the long-term outcome. Choice of the short-term outcome is called *impulsiveness*.

self-efficacy. Individuals' subjective perception of their capability to perform in a given setting or to attain desired results, proposed by Albert Bandura as a primary determinant of emotional and motivational states and behavioral change.

self-evaluation. One's description and evaluation of oneself, including psychological and physical characteristics, qualities, skills, and roles.

self-regulation. The ability to flexibly activate, monitor, inhibit, persevere, and/or adapt one's behavior, attention, emotions, and cognitive strategies in response to direction from internal cues, environmental stimuli, and feedback from others to attain personally relevant goals.

sensorimotor processes. Describing activity, behavior, or brain processes that involve both sensory (afferent) and motor (efferent) functions.

**separation**. The increased distance between adolescents and their parents that involves decreased dependence on parents when encountering problems.

working memory. The short-term maintenance and manipulation of information necessary for performing complex cognitive tasks, such as learning, reasoning, and comprehension. Sources: A. Hitlin, "Exercise of Human Agency Through Collective Efficacy," Current Directions in Psychological Science 9, no. 3 (2000): 75-78; A. Singer, "Narrative Identity and Meaning Making Across the Adult Lifespan: An Introduction," Journal of Personality 72, no. 3 (2004): 437-60; E. A. Caspar, A. Cleeremans, and P. Haggard, "The Relationship Between Human Agency and Embodiment," Consciousness and Cognition 33 (2015): 226-36; E. Panadero, "A Review of Self-Regulated Learning: Six Models and Four Directions for Research," Frontiers in Psychology 8, no. 422 (2017): 1-28; G. R. VandenBos, ed., APA Dictionary of Psychology (Washington, DC: American Psychological Association, 2007); S. Packwood, H. M. Hodgetts, and S. Tremblay, "A Multiperspective Approach to the Conceptualization of Executive Functions," Journal of Clinical and Experimental Neuropsychology 33, no. 4 (2011): 456–70; W. Beyers et al., "A Structural Model of Autonomy in Middle and Late Adolescence: Connectedness, Separation, Detachment, and Agency," Journal of Youth and Adolescence 32, no. 5 (2003): 351-65.





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