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Insights from Educational Psychology Part 2: Goals, Mindset, and Self-regulation

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INSIGHTS FROM EDUCATIONAL PSYCHOLOGY 2: GOALS, MINDSET, AND SELF-REGULATION

Abstract:

This installment of our continuing column on the connections between educational psychology and student library work explores the important roles of goal setting, mindset, and self-regulation. We describe how reference librarians may support students' goal selection and help students develop positive attitudes toward library research. Librarians' efforts to help students successfully complete library-related assignments can be enhanced by understanding the mechanisms of self-regulation.

"People are contributors to their life circumstances, not just products of them." – Albert Bandura

The first column in our series focused on ways to foster students' intrinsic motivation. In this column we explore the student attitudes and behaviors that are needed to transform motivation into academic achievement. Educational psychologists' efforts to parse out attitudes and behaviors that influence achievement have resulted in major lines of inquiry on goal orientation, mindset, perseverance, self-efficacy, and self-regulation. All are important for a student to become information literate and a proficient user of library resources. Take the example of a student who has been assigned a research paper. To complete high quality work,

the student needs reason(s) to succeed (goal orientation), belief that they can learn (mindset), confidence they can be successful (self-efficacy), willingness to overcome difficulties (perseverance), and an understanding of the task and the work necessary to complete it (self-regulation).

Goal Orientation

Educational psychologists have theorized that student goal orientations fall into one of two broad categories. Mastery or learning orientation is characterized by a focus on competence, understanding, and successful completion of a task. Performance goal orientation is characterized by a focus on outperforming others or obtaining extrinsic rewards like grades or expressions of approval (Linnenbrink and Pintrich, 2000). Performance goals were initially presumed to be less conducive to academic success than mastery goals, but early research on goal orientations raised doubts. Further study revealed that students who approached a task with a goal of performing well had different outcomes from those whose goal was to not appear inferior relative to others (Eccles and Wigfield, 2002). Striving toward or approaching a goal has a different effect from avoiding negative consequences. Performance goals and mastery goals can be pursued by an approach to achieve success or an effort to avoid making mistakes. Students experiencing an avoidance goal orientation tend to suffer from anxiety, which can undermine performance (Linnenbrink and Pintrich, 2000). Table 1 summarizes the theory of goal orientations.

TABLE 1: GOAL ORIENTATIONS

	Approach	Avoid
Mastery	Focus on mastering task and learning well. Seek self-improvement, progress and deep understanding.	Focus on avoiding misunderstanding or not learning. Avoid being wrong. Fear making mistakes.
Performance	Focus on besting others and appearing smart. Seek to get best grade or top place.	Focus on not appearing inferior to others. Avoid not coming in last. Fear being ranked at the bottom.
Adapted from Elizabeth A. Linnenbrink and Paul R. Pintrich (2000). Multiple pathways to learning and achievement: The role of goal orientation in fostering adaptive motivation, affect, and cognition. In C. Sansone, J. M. Harackiewicz, (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 195-227). San Diego, CA, US: Academic Press.		

Much as intrinsic motivation is assumed to be superior to extrinsic motivation, it seems logical to presume that mastery goal orientations support learning better than performance orientations. However, Linnenbrink and Pintrich (2000) note that students who meet a performance goal (high grade, a prize, praise or recognition) experience reinforced motivation, tend to continue putting forth high effort, and feel positively about themselves and their ability to succeed. Conversely, failing to meet a performance goal can be demotivating. The negative impacts of performance goals may be mitigated somewhat by basing the goal on an objective standard versus basing the goal on comparison to others. A goal based on an objective standard can be effective for high performers while hopefully reducing the negative impacts on those who perform less well.

Personal goals are very important throughout life, but particularly during major life transitions like going to college. How goals are chosen plays an important role. Conti (2000) investigated the degree to which students who autonomously and thoughtfully chose goals experienced successful transitions to college. She reasoned that students who accepted goals

suggested by parents or high school teachers instead of developing goals independently would not transition to college as well. Conti (2000) concluded that "developing a sense of purpose for attending college provides a motivational foundation that is crucial to successful adjustment, motivation, and performance" (p.200). Students need to have well thought through, autonomously formulated goals. Just accepting goals suggested by others does not serve students well, particularly when they face difficulties. Ongoing self-reflection helps sustain achievement of thoughtful, autonomously chosen goals.

But in the real life experience of students, goal-setting and achievement often are not entirely in their control. Most students, even those with a strong mastery/learning goal orientation, often have to balance that orientation with a performance goal orientation. That is because teachers, not students, usually set the academic goals for the students. The teacher typically assigns grades independently of students' self-assessment of their personal achievements. So how achievement is evaluated and measured is very important in students' real lives. Students must adapt to teacher's methods of evaluating successful achievement of goals or standards. Students will have greater opportunity to focus on mastery goals rather than competitive performance goals when their teachers use criterion-based grading systems rather than norm-referenced systems.

Academic goals and personal goals are both important for college success. However, students have much more control over their personal goals, and often less control of the academic goals required to make good grades in their classes. Autonomous students with strong mastery/learning goals often struggle because professors' expectations usually require acceptance of specific performance goals. Once a student selects an academic major that they are personally invested in, they are better able to balance their personal mastery goals within the

performance goal boundaries imposed by their professors. This maturation of goal setting fits

with the Phases of Interest Developmental (Renninger, 2009) we presented in Part 1.
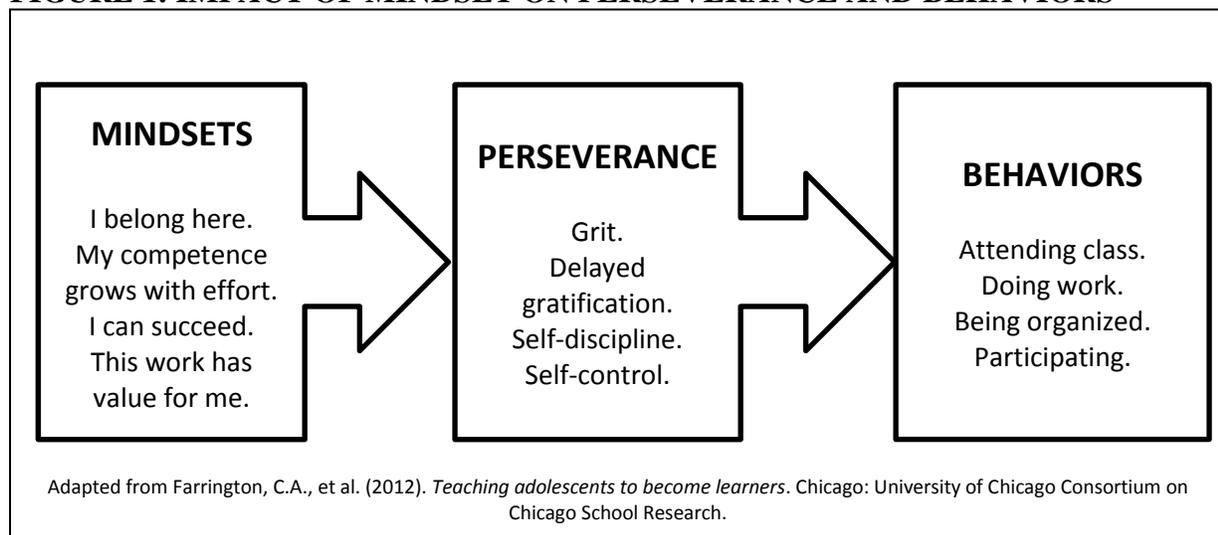
Mindset, Perseverance, and Self-efficacy

The term "mindset" has a general meaning and a specific meaning defined by

psychologist Carol Dweck and others. In common parlance a mindset is the direction or state of

one's thinking, attitudes and inclinations. Dweck (2006) theorizes that individuals generally have

either a fixed or a growth mindset. People with a fixed mindset assume that they have a given

personality, character, and level of intelligence. People with a growth mindset believe that

personal qualities can be cultivated through effort. Students achieve more when they have a

growth mindset because that attitude reinforces putting forth effort. It also greatly contributes to

the ability to overcome obstacles. For example, take a student who is trying to find, read, and

understand peer reviewed original research for the first time, and finds themselves quite lost. If

that student has a fixed mindset, he or she would be inclined to think "I'm just no good at this,"

and perhaps give up. A student with a growth mindset in the same situation would likely think "I

really need to work at this, and get the support I need." Dweck (2006) argues that students with a

growth mindset are able to achieve practically anything, and that the growth attitude is far more

important to academic success than innate ability.

Mindset is one of the so-called "non-cognitive" factors in learning. While skills,

strategies, attitudes and behaviors all clearly include cognitive components, the education

literature has long labeled content knowledge and academic skills as the "cognitive" component

of learning, so we're stuck with the terminology. Farrington et al. (2012) reviewed the research

on non-cognitive factors in education, and came to the conclusion that students' mindsets indeed

powerfully impact academic performance. Four particular academic mindsets were found to be

strong predictors of perseverance, behaviors, and academic performance: 1) I belong in this

academic community, 2) my ability and competence grow with my effort, 3) I can succeed at

this, and 4) this work has value for me (Farrington et al. 2012). Figure 1 summarizes the

relationship of mindset, perseverance, and academic behaviors.

FIGURE 1: IMPACT OF MINDSET ON PERSEVERANCE AND BEHAVIORS

Adapted from Farrington, C.A., et al. (2012). *Teaching adolescents to become learners*. Chicago: University of Chicago Consortium on Chicago School Research.

Non-cognitive factors can be supported through effective learning strategies such as

study skills, time management, and metacognition (thinking about how one is learning and

thinking). Among the many strategies discussed by Farrington et al. (2012), one of direct

applicability to library work is for students to verbalize their problem solving strategies. Doing

so helps students be aware of their process of investigation and learn that research is a process of

inquiry. Farrington et al. (2012) assert that the central point emerging from the available research

is that "the best ways to improve students' perseverance and strengthen their academic behaviors

is through academic mindsets and learning strategies" (p.73). Students need to be encouraged to

visit their professors and librarians for help and guidance. Receiving appropriate help promotes

effective effort by through good research, study, and learning strategies. It is not enough for students with a growth mind set to know that they need to work at this. That attitude needs to be combined with asking professors and librarians about more effective ways to engage in academic work.

As unfortunately often happens with ideas that can be expressed very succinctly, attempts to change students' mindsets have sometimes been based on an oversimplified view of the research. In particular, it is a mistake to treat fixed and growth mindsets as rigidly opposite poles on a single scale, because student's mindsets vary depending on context (Tempelaar et al. 2015). A primary benefit of a growth mindset is to spur students' effort and perseverance. Tempelaar et al. (2015) maintain that the crucial driver of effort is students' self-perceptions of the role effort plays in learning. Students can have positive achievement goals and be motivated to work hard without necessarily holding a growth mindset. Tempelaar et al. (2015) assert that belief that effort will pay off is key to perseverance, independently of whether an individual has a growth mindset.

Albert Bandura (2006) put it this way, "Unless people believe they can produce desired effects by their actions, they have little incentive to act, or to persevere in the face of difficulties" (p. 170). Bandura has enjoyed a very long and distinguished career as a psychologist, and he has consistently built his work on the premise that humans are active agents in creating our environment. His work is embedded in social cognitive theory, which assumes that learning is a social act. Much of what people learn, including how to influence our environment, occurs through modeling. Observing the actions of others teaches us how to act and how to influence our environment. The belief that one has personal power to effect changes by one's actions is labeled self-efficacy (Bandura 2006). Efficacy beliefs affect thoughts, motivations, feelings, and

decisions. Bandura emphasizes that students are agents of their own learning, not just recipients of information. He writes that in the internet age it is particularly important that students have the self-efficacy and self-directedness to contribute to a productive and innovative society (Bandura 2006). Individual confidence that one's actions can effect change strengthens society as a whole, because "people who develop their competencies, self-regulatory skills, and enabling beliefs in their efficacy can generate a wider array of options that expand their freedom of action and are more successful in realizing desired futures" (p. 165).

Self-regulation

Self-regulation consists of "processes that activate and sustain cognitions, behaviors, and affects, and that are oriented toward goal attainment" (Schunk and Zimmerman, 1997). Social influences powerfully impact self-regulation. Observational learning "occurs when observers pattern their behaviors, strategies, thoughts, beliefs, and affects after those of one or more models" (Schunk and Zimmerman, 1997, p. 195). Once something is observed, a person can then imitate the model's actions. The next step is to learn to independently do what the model did. A person becomes self-regulated when they can independently apply to new tasks the behaviors or strategies learned from the model(s).
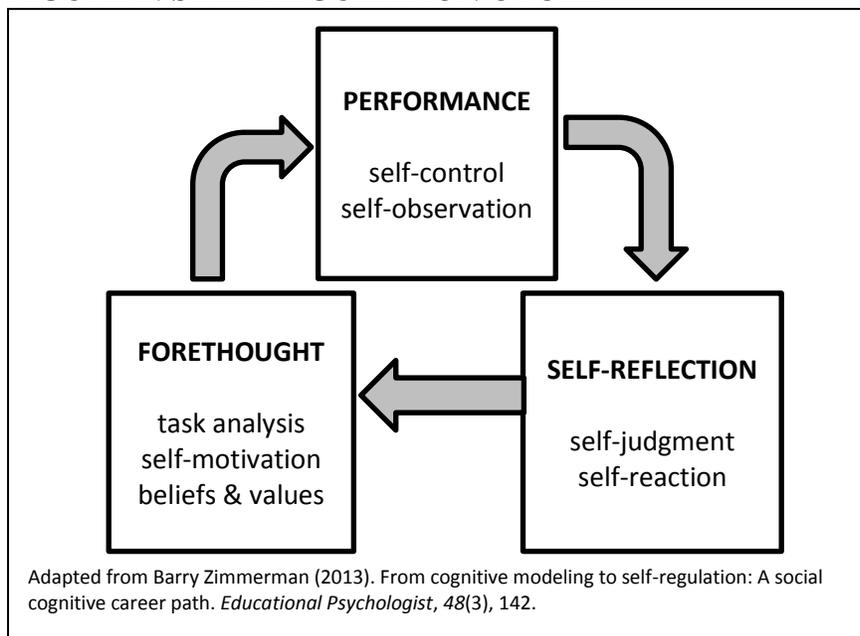
The self-regulation process comprises three levels: self-observation, self-judgment, and self-reaction. Timely, specific feedback supports effective self-regulation. Students who recognize a need to adjust will be more likely to seek support such as getting help from a reference librarian. To reiterate, social cognitive theory emphasizes that much of the self-

regulation learning process is based on observing models. By observing others, students can become more or less inhibited, learn to fit into a group, and learn new skills and strategies.

A teacher or librarian can be an effective model by combining explanations and demonstrations with verbalizations of the thoughts and reasoning for the actions taken (Schunk and Zimmerman, 1997). While students learn library research skills largely through practice, modeling in the form of demonstrations and explanations can be effective so long as strategies are explained well, students pay attention, and they have opportunities to independently imitate the model. Schunk and Zimmerman (1997) assert that well designed, highly structured learning experiences can foster development of self-regulation. Guidance and feedback by a more knowledgeable and skillful model is key to the development of self-regulation, achieved by observing and imitating librarians, professors, more capable peers, professionals in the field, and mentors.

Self-regulation is an iterative cycle, as depicted in Figure 2.

FIGURE 2: SELF-REGULATION CYCLE

PERFORMANCE

self-control
self-observation

FORETHOUGHT

task analysis
self-motivation
beliefs & values

SELF-REFLECTION

self-judgment
self-reaction

Adapted from Barry Zimmerman (2013). From cognitive modeling to self-regulation: A social cognitive career path. *Educational Psychologist*, *48*(3), 142.

At the start of a task, a student begins by setting goals and planning a strategy. This forethought phase includes identifying one's current self-efficacy, setting expectations for the outcome, and determining one's level of interest. In the performance phase the student studies, imagines outcomes, focuses attention, applies learning strategies, chooses study environments, and seeks help as appropriate. The performance phase includes self-recording of effort and self-monitoring progress. Once the task is complete, the self-reflection phase includes evaluating one's performance, attributing causes to the outcome, feeling a level of satisfaction, and adapting to feedback. The thoughts and feelings experienced in self-reflection then influence forethought on the next task (Zimmerman, 2013). Students with strong self-regulation will be proactive in adapting to feedback and evaluation, and change attitudes and behaviors in constructive ways. In contrast, students who attribute results to luck or other causes outside their control will react to feedback in unhelpful ways like feeling helpless, procrastinating, avoiding work, disengaging or being apathetic (Zimmerman, 2013).

Self-control is especially important for students transitioning to college. Potential distractions are practically unlimited, so without sufficient self-regulation a student will perform below their potential. Duckworth et al. (2016) describe a process model of self-control that begins with situational strategies (choosing or modifying times and places to work), followed by a transition to cognitive strategies (attention, appraising progress, responding to feedback). They found that of all the strategies available to college students, the timely choice of an appropriate work environment is the most effective means of self-control. Going to the library can be an excellent way to do that, so long as phones are turned off and computers are used for work instead of socializing. The work environment has a direct influence on personal factors (cognitions, self-efficacy beliefs) and behaviors (attentive reading, writing and study strategies).

Duckworth et al. (2016) recommend directly instructing students to choose environments that

minimize distractions.

An alternative presentation of the elements of self-regulated learning is shown in Table 2.

TABLE 2: PHASES AND AREAS FOR SELF-REGULATED LEARNING

Phase	Areas for regulation			
	Thoughts	**Emotions**	**Actions**	**Context**
Forethought, planning & activation	set goals, recall prior knowledge, make plans	form beliefs regarding difficulty of task and ability to succeed, activate interest in task	plan time and effort, plan to monitor behavior, form intentions	perceive task and learning context
Monitoring	be self-aware of thought processes	be self-aware of feelings and attitudes	manage time and effort, be aware of need for help	be aware of changing conditions
Control	choose learning strategies	select strategies to manage feelings	adjust effort, apply learning strategies, seek help	engage with task, choose work environment
Reaction & reflection	judge achievement	be self-aware of emotional responses	judge quality of choices made	evaluate task and context
Adapted from Paul Pintrich (2004). A Conceptual framework for assessing motivation and self-regulated learning in college students," *Educational Psychology Review 16*, 390.				

Pintrich's (2004) model is very similar to Zimmerman's (2013) self-regulation cycle. The

main differences are that Pintrich splits the performance phase into monitoring and control, and

he more directly describes the emotional aspects of self-regulation. Pintrich (2004) also

emphasizes that a key to self-control is the selection and use of cognitive and learning strategies.

He also notes that learning processes are usually specific to individual courses. That is, an

individual's forethought, monitoring, control and reflection for writing a history paper may be

quite different from the self-regulation they employ for a calculus class. The context of learning

for each academic discipline (or each personal life situation for that matter) will require different strategies for success. Students learn that they must read different types of textbooks and academic journals, and master discipline-specific writing and citation styles.

When a student perceives a task as uninteresting, strong self-regulation is needed to work through the unpleasant experience. Yeager et al. (2014) found that while self-control is important, students who have a self-transcendent purpose for learning are particularly able to apply self-regulation to boring tasks. Yeager et al. (2014) define a purpose for learning as "a goal that is motivated both by an opportunity to benefit the self and by the potential to have some effect on or connection to the world beyond the self" (p. 560). Telling a student what their purpose should be is futile and distinctly not autonomy-supportive. So to spur the development of a self-transcendent purpose the researchers had students write about how the world could be a better place. After completing the writing, students who expressed a self-transcendent purpose for learning persisted longer on a tedious task. The students didn't find the task more enjoyable, they were just more perseverant (Yeager et al. 2014).

Goals, mindsets, self-efficacy, perseverance and self-regulation constantly interact in ongoing cycles. Reference librarians support students' academic success, which in turn helps them develop appropriate goals, attitudes, strategies, and independence. Clearly, reference librarians can contribute to students' development of self-regulation processes. In our next column, we will investigate the role of self-concept in student learning, including the impact of anxiety on academic achievement.

Takeaways for Librarians

- Encourage students to set goals that satisfy their individual, autonomous standards of competence. Help students find the right balance between their individual learning/mastery oriented goals and the performance goals set by their professors.

- Ask students to reflect on how and why a library-related project fits into their overall goals.

- Specifically explain the difference between a fixed and growth mindset, and share examples of students who learned how to use the library by being persistent and asking for help as needed. (Carol Dweck argues that by simply learning about and self-reflecting on mindset, many students dramatically improve their academic achievement.)

- Clearly describe the strategies you are employing during reference transactions or instruction sessions. Explain not only what you are doing, but why you are doing it. Model not only the strategy but also your thought processes.

- Have students talk aloud about their thinking processes and research strategies.

- Support the self-regulation cycle by offering effective, efficient help when asked, and provide appropriate online guides, tutorials, FAQs, etc.

- If during a reference transaction a student chooses to talk about their learning process, carefully listen and suggest appropriate learning strategies.

- Students who wish to exercise self-control by modifying their situation should be able to choose the library as an environment conducive to academic work. It is an ongoing challenge to meet students' various needs for quiet study, group study, computer access, etc. But it is important to maintain a learning environment conducive to academic success.

- Have students think, talk, or write about how being information literate benefits not just them, but also society at large. (This could be connected to the "Information Has Value" part of the *Framework for Information Literacy*).

- Provide students examples of how to approach their professors with relevant questions related to assigned academic tasks.

Recommended Reading

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science*, *1*(2), 164-180. doi:10.1111/j.1745-6916.2006.00011.x

  Albert Bandura summarizes his four decades of work on human agency, based on the premise that people do not just respond to our environment, we help create it. People are intentional, use forethought, self-react, and self-reflect. All individuals can benefit from developing their competencies, self-regulation, and self-efficacy. Self-efficacy, the confidence that one can produce desire effects through personal action, is essential to perseverance. Efficacy beliefs affect whether one is optimistic or pessimistic, self-enhancing or self-debilitating. People are agents in the creation of our environment because human minds are generative, creative, proactive, and reflective, not just reactive. Learning is a social process because models, norms, aspirations and expectations come from family, friends, school, and work. Human agency is not only individual, it also occurs by proxy (e.g. actions of parents or teachers) and collectively in society.

Conti, R. (2000). College goals: Do self-determined and carefully considered goals predict

intrinsic motivation, academic performance, and adjustment during the first semester?

Social Psychology of Education, *4*(2), 189-211. doi:10.1023/A:1009607907509

Regina Conti investigated the effects of freshman students' goal setting on their

adjustment to academic, social, and emotional challenges as they transition to college. Conti

argued that a student's goals should be well thought out, based on self-reflection and

autonomously chosen. She hypothesized that having reflective and autonomous goals will

positively impact students' intrinsic motivation and academic performance. The results were not

entirely clear cut, but the findings revealed a pattern consistent with the view that developing a

clear purpose for attending college is key to successful adjustment, motivation and performance.

Reflection alone does not improve outcomes, it is important that goals be established

autonomously rather than to fulfill others' expectations.

Duckworth, A. L., White, R. E., Matteucci, A. J., Shearer, A., & Gross, J. J. (2016). A stitch in

time: Strategic self-control in high school and college students. *Journal of Educational*

Psychology, *108*(3), 329-341. doi:10.1037/edu0000062

Angela Duckworth is best known for her work on "grit". This study focuses on self-

control, the voluntary regulation of conflicting thoughts, feelings, and actions in accordance with

long-term goals. Exerting self-control is a process that occurs over time. Self-control strategies

start with selecting a situation, then modifying it if necessary (e.g. going to the library to study,

moving to a quieter place if needed). Next come cognitive strategies of self-control: paying

attention despite distractions, reappraising thought processes, then finally controlling responses

to the situation. The authors found that the most effective self-control strategy for studying is the

first step of the process, selecting an appropriate situation. They note that although students

know they should proactively choose the best situations to work, they do not always do so.

Explicitly teaching them to plan study situations in advance could be useful.

Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York, NY, US: Random

House.

This is an anecdote-filled, popular version of Carol Dweck's decades of research on

individuals' reactions to success and failure. She explains that people generally have one of two

mindsets. A fixed mindset is characterized by belief that one has a certain amount of intelligence,

a particular character, or a given moral character. A growth mindset is based on belief that one's

basic qualities can be cultivated through individual effort. People with growth mindsets are much

better able to overcome obstacles and bounce back from failures, and thus show more resilience

than people with fixed mindsets.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of*

Psychology, *53*(1), 109-132. doi:10.1146/annurev.psych.53.100901.135153

Jacquelynne Eccles and Allan Wigfield provide a succinct overview of four groups of

theories: expectancy, reasons for engagement, expectancy-value, and motivation+cognition. Self-

efficacy is based on a person expecting to succeed, and often includes a belief that one has

control over the situation. People tend to be engaged when they are intrinsically motivated, and

they need to feel competent and self-determined. A sense of "flow" can be obtained when one is

engaged in an optimally challenging task. Mastery versus performance goal orientations

influence achievement and attitudes. A person's choice among options is influenced by

cost/benefit analysis and expectation of success. Self-regulated students are metacognitively,

motivationally, and behaviorally active in their own learning. The authors call for more research

on the emotional aspects of motivation and the role of different social contexts.

Farrington, C.A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T.S., Johnson, D.W., &

Beechum, N.O. (2012). *Teaching adolescents to become learners. The role of

noncognitive factors in shaping school performance: A critical literature review*.

Chicago: University of Chicago Consortium on Chicago School Research. Retrieved

from http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED542543

The Atlantic featured Farrington et al.'s clearly written and thoroughly researched report

in an article on the importance of "noncognitive" factors to student achievement (Tough, 2016).

All students are more likely to persevere if the educational context supports positive mindsets

and effective learning strategies. Exhorting students to have grit is unlikely to enhance

perseverance, but teaching skills and strategies in a supportive context can improve students'

performance. Important learning strategies include metacognition, self-regulation, time

management, and goal setting. Effective application of strategies improves performance, which

in turn reinforces positive mindsets toward learning.

Linnenbrink, E. A., & Pintrich, P. R. (2000). Multiple pathways to learning and achievement:

The role of goal orientation in fostering adaptive motivation, affect, and cognition. In C.

Sansone, J. M. Harackiewicz, C. Sansone, J. M. Harackiewicz (Eds.), *Intrinsic and

extrinsic motivation: The search for optimal motivation and performance* (pp. 195-227).

San Diego, CA, US: Academic Press. doi:10.1016/B978-012619070-0/50030-1

Goals are cognitive representations of what individuals wish to achieve. The common model in educational psychology is that there are two categories of achievement goals. A mastery or learning goal is based on seeking understanding. A performance goal is based on outperforming others and obtaining extrinsic rewards. Mastery goals are usually portrayed as superior to performance goals, much as intrinsic motivation is often assumed to be superior to extrinsic motivation. The authors provide a more complex and nuanced analysis that incorporates whether one wishes to approach a goal (achieve success) or avoid a goal (prevent mistakes or looking dumb). They also take into account emotional aspects of goal orientation, particularly how avoidance undermines performance and creates anxiety. Linnenbrink and Pintrich conclude that approach performance goals may be appropriate for some students in some situations.

Pintrich, P. R. (2004). A Conceptual Framework for Assessing Motivation and Self-Regulated

Learning in College Students. *Educational Psychology Review*, *16*(4), 385-407.

Paul Pintrich explains that self-regulated learning is based on four assumptions: 1) students are active participants in the learning process, 2) students are capable of monitoring, controlling, and regulating aspects of their thoughts, emotions, and behaviors, 3) students set goals for their learning, 4) self-regulation influences actual achievement. Students can regulate thoughts by using cognitive strategies such as rehearsal, elaboration and organization techniques. Means of regulating emotions include setting goals, forming attitudes, and developing personal interest. Students can regulate behavior many ways, including managing time and seeking appropriate help. The learning context may largely be out of control of an individual student, but one can regulate the learning environment through means such as going to the library or taking advantage of office hours.

Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence.

Educational Psychologist, *32*(4), 195-208. doi:10.1207/s15326985ep3204_1

Success in school requires self-regulation of thoughts, behaviors, and feelings. Students learn how to be self-regulated largely through observing models such as teachers, coaches, and peers. According to social cognitive theory, human functioning is a series of reciprocal interactions among behavior, the environment, and individual thoughts and feelings. Social interaction underlies three levels of self-regulation: self-observation, self-judgment, and self-reaction. Effective self-regulation depends on feeling self-efficacious for using skills to achieve mastery. Observing models is often the basis for developing the three levels of self-regulation. Self-efficacy is the personal belief that one is capable of learning or performing at a designated level. Teacher guidance and structured experiences help students develop self-efficacy and self-regulatory skills.

Tempelaar, D. T., Rienties, B., Giesbers, B., & Gijselaers, W. H. (2015). The pivotal role of

effort beliefs in mediating implicit theories of intelligence and achievement goals and

academic motivations. *Social Psychology of Education*, *18*(1), 101-120.

doi:10.1007/s11218-014-9281-7

The researchers correlated the interaction of twenty-three variables related to mindset, goal formation, and motivation. The conclude that many studies based on Carol Dweck's theory of self-theories regarding intelligence oversimplify by incorrectly treating the fixed and incremental mindsets as bipolar opposites. Instead, student mindsets are nuanced and context-dependent. They found that student's self-perceptions of the role effort plays in learning are

critically important, and not necessarily correlated to mindset. That is, a student who generally

believes intelligence can increase with effort will not necessarily believe that exerting effort will

allow them to achieve a specific goal. The authors suggest that intervention programs may profit

from focusing on effort beliefs, rather than on whether intelligence is fixed or malleable.

Yeager, D. S., Henderson, M. D., Paunesku, D., Walton, G. M., D'Mello, S., Spitzer, B. J., &

Duckworth, A. L. (2014). Boring but important: A self-transcendent purpose for learning

fosters academic self-regulation. *Journal of Personality and Social Psychology*, *107*(4),

559-580. doi:10.1037/a0037637

Purpose for learning is motivated both by an opportunity to benefit the self and the

potential to have a positive impact on others. Having a purpose for learning (a self-transcendent

motive) can foster greater meaning in schoolwork and promote academic self-regulation. A self-

transcendent motive makes boring tasks more bearable, not more enjoyable. In a series of

experiments the authors found that students with a self-transcendent purpose did exhibit greater

perseverance with boring tasks. Unfortunately it doesn't work to simply tell students they should

have a purpose, because that would violate their need for autonomy. Educators can instead try to

find ways to help make students connect tasks with their personal motives and their desires to

benefit others.

Zimmerman, B. J. (2013). From cognitive modeling to self-regulation: A social cognitive career

path. *Educational Psychologist*, *48*(3), 135-147. doi:10.1080/00461520.2013.794676

Barry Zimmerman has had a long career investigating the impact of self-regulation on

academic achievement. This article is based on his speech at an American Psychological

Association conference accepting the Thorndike lifetime achievement award in educational psychology. Zimmerman describes how self-regulation theory grew from recognizing that learning has personal, behavioral, and environmental components. Students who self-regulate employ strategies and use feedback to adapt and succeed. Zimmerman describes fifteen categories of learning strategies. These include seeking information, keeping records, environmental structuring (e.g. going to the library to study), and seeking assistance. Students who proactively apply appropriate forethought and learning strategies have better learning outcomes compared to those who merely react to the demands of a task.

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Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science*, *1*(2), 164-180. doi:10.1111/j.1745-6916.2006.00011.x

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