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# Insight from Educational Psychology Part 7: Rewards, Motivation, and Performance

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## **Insights from Educational Psychology Part 7: Rewards, Motivation, and Performance**

What influences do rewards and punishments have on students' learning? Common sense suggests that rewarding good performance enhances learning. After all, who does not appreciate tangible recognition for hard work? But educational psychologists have discovered that the influence of rewards on motivation and performance is complex, because it depends on individuals' values and goals. Insights from educational psychology into types of rewards and how they are offered can help librarians incorporate effective incentives in library instruction.

### **The legacy of behaviorism**

Psychologists have long debated the relative impacts of thoughts, feelings, and behaviors on individuals' motivations. Humanistic psychologists have viewed inner emotional feelings as the primary source of our actions. The work of Carl Rogers (1983) is a leading example of the humanistic view of personal development and motivation. He advocated for education that placed individual students' needs at the center of teaching. In Roger's (1983) view, the role of the teacher should be to facilitate individual learning rather than control the individual through extrinsic means. Cognitive psychologists maintain that individuals' conscious thoughts are key to understanding behavior. Both cognitive and humanistic perspectives recognize the importance of personal introspection in fostering motivated behavior. Teachers and librarians can create learning environments that help students develop and control their cognitions and emotions in adaptive ways. Whether the emphasis is on thoughts or feelings, the instructional goal is to increase students' intrinsic desire to learn. As discussed in Part 1 of this series (Black & Allen, 2017), many cognitive psychologists focus on how educators can tap into students' intrinsic interests (Renninger, 2009), self-determination needs (Ryan & Deci, 2000), and cognitive attributions for success (Weiner, 2010).

Behaviorists, however, assert that it is impossible to really know what goes on in another's heart or mind. So from the perspective of behavioral psychology, educators can best motivate learning by focusing on actions that can be externally observed and extrinsically controlled. B.F. Skinner, a major proponent of this view, led a program of research that resulted in theories that became known as radical behaviorism. In its purest form, Skinner's behaviorism asserts that human actions are entirely controlled by environmental influences. While few if any behaviorists entirely discounted the role of cognition or emotions in how people act, the science of behaviorism was based on manipulating experience to control behavior (Skinner, 1976). Behaviorists reasoned that since it is impossible to really know what people think or feel, one need only measure the influences of stimuli on behavior to describe the causes of human actions. Debates over the relative merits of cognitive, humanistic and behavioral views of learning and motivation have spanned over a century (Uttal, 2000), and continue to influence educational psychology and its applications to teaching and learning.

Since the cognitive and humanistic approaches assume students will have intrinsic motivation to learn (especially if given choice of topics to study or explore), the role of students' personal experiences and development is perpetually relevant (Palmer, Zajonc, & Scribner, 2010). Unfortunately, curricula don't always align with students' individual interests. So what can teachers and librarians do about students who display little or no motivation for the task at hand? Are there appropriate ways to control students' behaviors to achieve desired outcomes? Behavioral psychologists have worked for decades on effective ways to use external stimuli such as tangible reinforcements and rewards to elicit desired academic-related behaviors from students.

Behavioral approaches to general education peaked in the 1960's. But techniques of reinforcement of desired behaviors are still widely used in both general and special education and have been advocated as a means to bring all students to acceptable levels of performance. Three specific behavior modification examples illustrate the application of behavioral science to the real-world problem of trying to motivate the initially uninterested student: programmed instruction, token economies, and group contingencies. Skinner (1961) pioneered programmed instruction as a way to provide immediate feedback to individual students in a manner impossible in a traditional classroom setting. Students worked at their own pace through assignments with frequent checks for understanding. They were not allowed to advance until they had demonstrated mastery of the unit of instruction. The key to programmed instruction was immediate rewards for desired behaviors.

Initial enthusiasm for programmed instruction waned due to the difficulty of creating effective programs, the impossibility of anticipating all interpretations of content, and cultural uneasiness over reducing the role of the teacher to a machine (Rutherford, 2009). Recently, however, better technology and sophisticated computer gaming models have led to a revival in applications of programmed instruction. Computer-based or assisted instructional programming (CBI/CAI) is enjoying a resurgence in part because most college students are familiar with computer games and thus are comfortable working in a gaming context. Mallon (2013) described various tools librarians can use to incorporate gaming techniques into library instruction programs.

A token economy is a system of applied behavior modification strategies. In a token economy, the environment is arranged so that reinforcement is made contingent on individuals' behaviors. When a student exhibits desired behavior, a token is received which may be

exchanged for something of value. Thus tangible immediate feedback is given for desired behavior, but the behavior must be repeated to earn a reward. Token economies have been implemented in schools and other settings with varying degrees of success (Rutherford, 2009). A group contingency plan is similar to a token economy except rewards are based on the overall behavior of the entire group of students. Teachers manage the classroom by targeting desired behaviors, explicitly teaching expected behaviors, and providing rewards to students for demonstrating desired behaviors (Chow & Gilmour, 2016). One variation is to make uncertain the number of points required to earn an award, because a variable schedule of reinforcement can increase motivation to behave in the desired manner (Collins et al., 2017).

The legacy of behaviorism still pervades American culture (Rutherford, 2009). The behaviorists did not invent the idea that externally applied reinforcements affect behavior, but their work provided research-based evidence that external rewards can produce desired outcomes. Studies that provided evidence to the contrary sparked a debate that continues to this day.

### **Do rewards undermine intrinsic motivation?**

Despite behaviorism and what seems to be common sense, some psychologists have questioned the assumption that rewards are motivating. Drawing on earlier work, DeCharms (1968) theorized that if a person receives an external reward for an activity they are intrinsically motivated to do, their reason for acting will shift to the reward and away from the inherent enjoyment of the task: “The motivation to perform a task undertaken originally as a result of the desire to demonstrate personal causation will suffer if an extrinsic reward is offered” (p. 329). DeCharms cited experiments with monkeys to illustrate his point. So what about humans? Deci (1971) devised experiments to test how external rewards influenced intrinsic motivation in

college students. Randomly chosen students were paid to solve puzzles or write headlines for the student paper. Those who received pay spent less time on the tasks during free periods, which was taken as evidence that intrinsic motivation had been undermined. Verbal praise did not have the same undermining effect as tangible rewards on intrinsic desire to engage in the tasks (Deci, 1971).

The degree to which external rewards may undermine intrinsic motivation has received close scrutiny and sparked controversy. Deci and colleagues asserted that tangible rewards like cash payments decrease intrinsic motivation as measured by how much people engage in an activity when given free choice to do so (E. L. Deci, Koestner, & Ryan, 1999). Cameron, Banko, & Pierce (2001) countered that the empirical evidence from multiple studies was not strong enough to conclude that tangible rewards undermine intrinsic motivation. A recent meta-analysis of 957 studies on the undermining effect notes that the controversy is partly due to how difficult it is to experimentally test complex human motivation (Cerasoli, Nicklin, & Ford, 2014). The authors note the “inability to reconcile three seemingly true, but incompatible premises: (a) incentives boost performance, (b) intrinsic motivation boosts performance, and (c) incentives reduce intrinsic motivation” (p. 984), and conclude that although “it is always beneficial to help people find their tasks intrinsically rewarding, extrinsic incentives can and will also play a role” (Cerasoli et al., 2014, p. 1000). Psychologists have been developing more nuanced theories of how rewards influence motivation and performance in response to the apparently contradictory premises.

### **Recent research on rewards and motivation**

To what we attribute the causes of our successes and failures impacts our motivations and emotions (Weiner, 1985). As an early skeptic of the efficacy of external rewards, DeCharmes

(1968) theorized that responses to rewards are rooted in whether individuals perceive themselves as the originators of their behaviors or as pawns whose behaviors are controlled by others. Attributions of locus of control affect the efficacy of rewards. If a reward strengthens (or at least does not undermine) feelings of autonomy it should boost motivation. Self-determination theory is a research-based elaboration of the basic idea that a person will respond to an award differently depending on perceptions of who or what is in control. According to self-determination theory, motivation is driven primarily from innate human desires for autonomy, relatedness, and competence (Ryan & Deci, 2000). How external rewards influence intrinsic motivation is therefore based on how individuals value the rewards within the context of their personal goals, interests, and abilities. Individual reactions to rewards can range from being utterly meaningless to being closely aligned with one's self-concept. Figure 1 summarizes the continuum from being entirely unmotivated to being fully intrinsically motivated.

**Figure 1: The Motivation Continuum**

Level	Description	Example
Amotivation	External rewards are not valued by the individual and do not affect behavior	Blow off research project because of lack of belief that the work will yield a desired outcome or do not care about the consequences of noncompliance
External regulation	Performance is to satisfy an external demand or to achieve and externally imposed reward	Complete research project solely to achieve the desired grade or credit, with no emotional involvement
Introjection	Respond to feeling of pressure in order to avoid guilt or anxiety, or to attain pride	Do research project because of a sense that it's the right thing to do and/or for sense of achievement
Identification	Accept the external regulation as a part of one's own values and goals	Do project because it helps fulfill personal goals
Integration	Assimilate the external regulation into personal values and goals	Do project because of a genuine desire to achieve an outcome separate from the activity itself

Intrinsic motivation	Perform an act entirely for the inherent pleasure of doing so	Do project for enjoyment with no external reward for completion
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Using the lens of self-determination theory to examine the effects of rewards, (Ryan & Deci, 2009) identified four levels of autonomous acceptance of an extrinsic contingency. The first and most controlling is external regulation. This is the cut-and-dried type of reward that is offered to receive something or to avoid punishment. A person who responds to external regulation does so not because of any inherent interest in the task, and does not perceive value in the reward beyond whatever immediate satisfaction it provides. External regulation entails little if any emotional involvement. The next type of extrinsic motivation is introjected regulation, which adds an emotional component to the reward. With introjected regulation the individual feels shame or guilt for not achieving the reward or pride and sense of accomplishment for success. Self-esteem is tied to the outcome and tends to create self-imposed stress to achieve the reward. The third type of extrinsic motivation is identified regulation. At this stage the individual accepts the target behavior as a personal goal. The most autonomous form of extrinsic motivation is integrated regulation. An integrated extrinsic motivator is accepted as a part of one's core sense of self and becomes part and parcel of one's identity. Integrated regulation is quite similar to intrinsic motivation. The key difference is that intrinsic motivation is based on interest in a task, while integrated regulation is based on the value one places on a task (Ryan & Deci, 2009).

Intrinsic and extrinsic motivators are not mutually exclusive. For example, a faculty librarian conducting research for publication can be inherently interested in the topic, and value the satisfaction of seeing the work published in a journal, as well as understand a publication

may lead to the reward of tenure. Similarly, a student may be genuinely interested in a research project while simultaneously striving to earn a good grade. In fact it's quite adaptive for a student to pursue personal interests while simultaneously paying attention to extrinsic consequences of those actions, which may include pleasing the teacher or others (Lepper, Corpus, & Iyengar, 2005). The best scenario is when students are moderately extrinsically motivated and highly intrinsically motivated. In keeping with self-determination theory, Lin, McKeachie, & Kim (2001) found that rewards did not diminish intrinsic motivation so long as the students perceived the rewards as being related to competence and self-determination. They note that frequent reference to grades is probably less motivating than encouraging students to see how well they are mastering the material (Lin et al., 2001). Similarly, Cameron, Pierce, Banko, & Gear (2005) found that if rewards are given for successful achievement and are aligned with individuals' valued skills, the rewards are not seen as controlling and do not undermine intrinsic motivation. In other words, rewards can be effective if they do not undermine feelings of competence and autonomy.

Until quite recently investigations in neuroscience have not focused on the influence of rewards on humans. Recall that above we sketched the long-standing difference of views between the cognitive, humanistic, and behavioral psychologists. The behaviorists asserted that we could not really know what goes on in people's minds. That is probably still true in the most literal sense, but new techniques of brain scanning provide evidence-based clues of what is going on. Neuroscientists have identified the reward circuitry in the brain and have determined that rewards have three distinct components: liking, wanting, and learning (Hidi, 2016). Neuroscience research has established that rewards can and do influence behavior, enhance attention, reduce reaction times, and increase memory (Hidi, 2016). But these of rewards were

measured in a brain scanning laboratory setting. How do those findings apply to the complex reality of educating students? Hidi (2016) provides no firm answers, but suggests that rewards can induce desired behavior from unmotivated individuals in the short term, and that rewards may be more effective when they are unexpected. She concludes that more research is needed on the way rewards are provided, how they are earned, and individual differences in reward processing (Hidi, 2016).

The preponderance of educational psychology research on rewards and motivation we have referenced so far was conducted within the American and Western European cultural paradigm. Does the assumption that rewards that compromise autonomy and personal competence undermine intrinsic motivation hold true across cultures? This is an area ripe for exploration, but some research indicates that there are indeed cultural variations. Tao & Hong (2014) explored social-oriented achievement motivation among Asian students. In a social-oriented culture, students take academic achievement as an obligation to parents and family. For Asian students, obligation to family is typically an integrated extrinsic motivator. That is, although familial obligation is extrinsic as defined by Ryan and Deci (2009), the motivation to fulfill obligations to family is accepted as a part of the core sense of self and becomes part and parcel of students' identities. The authors conclude "A[n Asian] student may see academic activities as a means to satisfy parental expectations and a means to acquire skills and knowledge for the sake of learning. Holding an extrinsic and intrinsic goal at the same time does not seem to bother Chinese students" (Tao & Hong, 2014, p.130). The degree to which social-oriented achievement motivation affects students in various cultures is a topic in need of investigation.

## **Motivating for Competence**

It seems to us that the controversy over rewards undermining motivation pivots around what we want students to do within a specific time frame. Rewards can induce at least some reluctant students to achieve in the short term. But if the extrinsic motivator(s) are not internalized, the rewards will lose effect, probably sooner rather than later. It is counter-productive to continually apply extrinsic motivators like grades or future opportunities to students who do not personally value those rewards. If self-determination theory holds true, a viable alternative is to focus on motivating students to gain competence. Based on the educational psychology research to date, Urdan & Turner (2005) recommend these practices for promoting competence motivation:

- Assign personally meaningful and relevant tasks
- Make assignments moderately and appropriately challenging
- Promote students' autonomy and sense of control by providing choices
- Avoid coercion whenever possible
- Encourage students to focus on personal mastery and skill development (vs. grades or performance relative to others)
- Help students develop personal achievable learning goals
- Infuse novelty, variety, and humor
- Give feedback on learning strategies and competency development
- Help students become aware of their current skill levels and set realistic expectations.

Urdan and Turner (2005) readily acknowledge that these practices are far easier said than done. Individualized instruction for entire classes of students can be logistically difficult or impossible. It is also difficult for teachers or librarians to discern what students will find personally relevant.

One possible solution to the difficulty in knowing what will be interesting is to provide students choices in what and how they learn.

### **Choice and personal relevance**

Recall that in Part 6 we described Universal Design for Learning (UDL), which integrates options for how students learn and express what they have learned. An additional argument for providing options is that offering choices maximizes the chance of matching individuals' intrinsic motivations with the course learning goal. However, the research on links between providing choices and increases in student academic achievement has been mixed (Patall, Cooper, & Robinson, 2008). An inherent difficulty is how to parse the effects of the act of choosing from matching interests to tasks, to wit "is it the sense of autonomy one gains from being allowed to choose that benefits motivation or does having choices lead to an increase in interest?" (Flowerday & Shell, 2015, p.135). In their study of college undergraduates, Flowerday & Shell (2015) found that providing choice did not increase student's interest in the topic, and although choice led to more positive attitudes, it did not significantly improve learning. It is becoming clear that the effects of choice depend on the type of choice, the circumstances, and individuals' reactions (Patall, 2013). The crux of the problem of providing choice is that having to choose requires effort. Patall (2013) found that "for students who lack individual interest, choosing may be experienced as unnecessary, or even overwhelming" (p. 531). Additionally, for students who do already have an interest in the task, providing choices can have a negative impact on motivation because having to choose among more or less equally desirable options requires effort but brings no benefit.

The evidence for student interest having positive effects on learning is more compelling than evidence for providing choice. A student who brings a personal interest to a topic is more

likely to be intrinsically motivated to learn. Flowerday & Shell (2015) concluded that “the motivational benefit of choice in and of itself is not readily apparent. Motivation and learning may be better served by the development of situationally interesting lessons and instruction” (p. 139).

Interest and motivation to learn is tied to the degree of personal meaningfulness or relevance the topic has for individual students. Priniski, Hecht, & Harackiewicz (2018) describe three degrees of personal relevance: association, usefulness, and identification. Personal association occurs when the topic has some connection with an object or memory that is personally valued. Usefulness is the utilitarian application to fulfill a personal goal. Identification applies when the topic is either of intrinsic interest or has become integrated into one’s core sense of self. The three types of relevance can coexist and may be the targets of interventions to help students see personal connections and recognize utility to achieve goals (Priniski et al., 2018).

Research in the psychology of education tells us that teachers and librarians should identify and promote personal interests and goals of students as much as possible within the parameters of the academic task. This entails being culturally competent with the students and paying close attention to their expressed interests. It also means responding quickly to weaknesses in individuals’ skills with necessary supports. A student who feels a lack of competence using library resources will probably lose motivation for doing research unless resources are available to build competence. The rewards offered students to gain skills and build competence need to be tied to individual goals and interests.

## Takeaways for Librarians

- A program of instruction that allows students to work at their own pace with frequent checks for understanding can be effective for skill development.
- Offering rewards for performance may undermine students' intrinsic motivation to learn.
- If rewards are offered, design them so achievement remains in control of the students. Make clear what the performance standards are and offer the supports needed to meet those standards.
- Verbal rewards can be more effective than tangible rewards.
- The worst kind of rewards are those that control behavior and undermine self-determination.
- Do not offer rewards that cannot be sustained over time, as the removal of rewards is particularly damaging to motivation.
- Students learn best in an environment of moderate extrinsic motivation and high intrinsic motivation. It's good care about grades, just not too much.
- Focus on motivating students to gain competence through well-designed assignments that promote autonomy and facilitate achievement of personal goals.
- Offering choice of assignments is less effective than designing assignments that are likely to attract students' interest.
- The fact that reference librarians aren't assigning grades is a strength, as it may liberate us to focus on what is most interesting and useful.

## **Recommended Reading**

**Cameron, J., Banko, K. M. & Pierce, W.D. (2001). Pervasive negative effect of rewards on intrinsic motivation: The myth continues. *The Behavior Analyst*, 24, 1-44.**

**DOI:10.1007/BF03392017**

This paper represents one side of the rather fierce dispute over whether extrinsic rewards undermine intrinsic motivation. The ideological feud was much about methodologies and can be difficult to follow. Nevertheless Cameron, Banko & Peirce's paper is valuable for its parsing of the effects of different kinds of rewards. The different types of rewards include: unconnected to task, for doing well, for completing regardless of quality of performance, per sub-task or milestone, and achieving a score or exceeding a norm. A notable conclusion from this meta-analysis is that verbal rewards have greater motivating effect than do tangible rewards. Unsurprisingly, the authors conclude that rewards have different effects in different conditions. Because context is important, they argue that it is an oversimplification to conclude that external rewards undermine intrinsic motivation.

**Cerasoli, C., Nicklin, J., & Ford, M. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin*, 140(4), 980-1008. 10.1037/a0035661**

The authors point out that an underlying problem with the research on intrinsic and extrinsic motivation is a logical puzzle they call the uncomfortable conclusion, "an inability to reconcile three seemingly true, but incompatible premises: (a) incentives boost performance, (b) intrinsic motivation boosts performance, (c) incentives reduce intrinsic motivation" (p. 984). As other researchers note, the problem lies in the fact that how incentives influence people depends

on context. How an incentive is offered matters more than whether an incentive is offered. The authors conclude that it is always helpful to help people be intrinsically motivated, but rewards play a role in school and the workplace. Clear extrinsic rewards tied specifically to well-defined performance criteria can be very effective for straightforward and repetitive tasks. But extrinsic rewards tend to undermine desired performance when the goal is to support creativity, autonomy, teamwork, and individual growth.

**Hidi, S. (2016). Revisiting the role of rewards in motivation and learning: Implications of neuroscientific research. *Educational Psychology Review*, 28, 61-93.**

**DOI:10.1007/s10648-015-9307-5**

Noting that the role of rewards has been very contentious in social and educational psychology, Suzanne Hidi described the effects of rewards on neural activity in the context of existing research. Neuroscientists define rewards as positive reinforcements of learning, approaching something, or feeling good. The author provided a thorough but succinct overview of rewards research in both psychology and neuroscience. There are three distinct components of rewards: liking, wanting, and learning. Rewards can enhance attention, reduce reaction times, and increase memory. Contrary to the assertions of Deci and Ryan, Hidi proposed that rewards undermine motivation more because of removal of reward than negative reaction to external control. Hidi concludes that unexpected rewards do not undermine intrinsic motivation. Educators should avoid offering rewards that cannot be sustained over time.

**Lin, Y, McKeachie, W.J. & Kim, Y.C. (2003). College student intrinsic and/or extrinsic motivation and learning. *Learning and Individual Differences*, 13, 251-258.**

**DOI:10.1016/S1041-6080(02)00092-4**

The researchers investigated the interaction of intrinsic motivation to learn and extrinsic motivation to earn a good grade among college students in one Korean and three U.S. colleges. They found that a moderate level of motivation to achieve a high grade is more conducive to learning than is a very strong desire to earn a high grade. The best mix es to have high intrinsic motivation and a moderate level of extrinsic motivation. In other words, care about grades, but not too much. The authors conclude that teachers should not frequently reference tests and grades, but rather encourage students to focus on how well they are mastering the course content.

**Ryan, R. M. & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25, 54-67.***

**DOI:10.1006/ceps.199.1020**

Among the dozens of publications on motivation by Richard Ryan and Edward Deci, this is one of the most concise, comprehensive, and accessible. Types of motivation and applicable theories are defined and examples are provided. The main thesis is that the effects of motivators are centered on an individual's feelings of competence and autonomy. People take on external motivators as their own along a continuum: unmotivated, externally controlled, introjected, self-identified, integrated, and intrinsically motivated. Since much of what people learn in school is not inherently interesting, the challenge is to facilitate the integration of educational goals with personal values. For this to happen, students need to have a sense of belonging and feel respected and cared for. When students see the value of the learning and have the skills to be competent, they are likely to integrate the learning task with their personal goals and values.

**Sansone, C., & Harackiewicz, J. M. (Eds.). (2000). *Intrinsic and extrinsic motivation: The search for optimal motivation and performance.* San Diego, CA: Academic Press.**

The authors of the fifteen chapters of this edited book represent many of the leading motivation researchers. The editors clearly describe the debate regarding the extent to which rewards may undermine intrinsic motivation, and carefully chose authors well positioned to argue the relevant points of view. Chapters describe types of rewards, the role of goal orientations, attribution of meaning to goals, how level of interest affects motivation, and the role of parenting. Although slightly dated, this volume remains one of the best introductions to the research on motivation. The editors' underlying conviction that extrinsic and intrinsic motivation are not mutually exclusive results in a balanced and nuanced overview of the effects of motivation on creativity, academic performance, and persistence.

**Tao, V.Y.K. & Hong, Y. (2014). When academic achievement is an obligation: Perspectives from social-oriented achievement motivation. *Journal of Cross-Cultural Psychology*, 45, 110-136. DOI:10.1177/0022022113490072**

Vivienne Tao and Ying-yi Hong note at the outset that much of the research on academic achievement is rooted in Western assumptions about intrinsic motivation. This study of Chinese college students obligation to parents and significant others as motivation to achieve. Social-oriented achievement motivation is driven by desire to gain social support and bring honor to one's family. The researchers found a significant correlation between social-oriented and individual motivation to achieve. They also found that social-oriented motivation correlates with test anxiety and feelings of guilt if academic goals are not achieved. The 60-item measure of social- and individual-oriented achievement motivations used for the study is appended.

## References

- Black, S., & Allen, J. D. (2017). Insights from educational psychology part 1: Foster intrinsic motivation. *The Reference Librarian*, *58*(1), 91–105.  
<https://doi.org/10.1080/02763877.2016.1200515>
- Cameron, J., Banko, K. M., & Pierce, W. D. (2001). Pervasive negative effects of rewards on intrinsic motivation: The myth continues. *The Behavior Analyst*, *24*(1), 1–44.
- Cameron, J., Pierce, W. D., Banko, K. M., & Gear, A. (2005). Achievement-based rewards and intrinsic motivation: A test of cognitive mediators. *Journal of Educational Psychology*, *97*(4), 641–655. <https://doi.org/10.1037/0022-0663.97.4.641>
- Cerasoli, C. P., Nicklin, J. M., & Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin*, *140*(4), 980–1008. <https://doi.org/10.1037/a0035661>
- Chow, J. C., & Gilmour, A. F. (2016). Designing and Implementing Group Contingencies in the Classroom: A Teacher's Guide. *TEACHING Exceptional Children*, *48*(3), 137–143.  
<https://doi.org/10.1177/0040059915618197>
- Collins, T. A., Hawkins, R. O., Flowers, E. M., Kalra, H. D., Richard, J., & Haas, L. E. (2017). Behavior bingo: The effects of a culturally relevant group contingency intervention for students with ebd. *Psychology in the Schools*. <https://doi.org/10.1002/pits.22091>
- DeCharms, R. (1968). *Personal causation: the internal effective determinants of behavior*. New York: Academic Press.
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, *125*, 627–668.

- Deci, Edward L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, 18(1), 105–115. <https://doi.org/10.1037/h0030644>
- Flowerday, T., & Shell, D. F. (2015). Disentangling the effects of interest and choice on learning, engagement, and attitude. *Learning and Individual Differences*, 40, 134–140. <https://doi.org/10.1016/j.lindif.2015.05.003>
- Hidi, S. (2016). Revisiting the role of rewards in motivation and learning: Implications of neuroscientific research. *Educational Psychology Review*, 28(1), 61–93. <https://doi.org/10.1007/s10648-015-9307-5>
- Lepper, M. R., Corpus, J. H., & Iyengar, S. S. (2005). Intrinsic and extrinsic motivational orientations in the classroom: Age differences and academic correlates. *Journal of Educational Psychology*, 97(2), 184–196. <https://doi.org/10.1037/0022-0663.97.2.184>
- Lin, Y.-G., McKeachie, W. J., & Kim, Y. C. (2001). College student intrinsic and/or extrinsic motivation and learning. *Learning and Individual Differences*, 13(3), 251–258. [https://doi.org/10.1016/S1041-6080\(02\)00092-4](https://doi.org/10.1016/S1041-6080(02)00092-4)
- Mallon, M. (2013). Gaming and Gamification. *Public Services Quarterly*, 9(3), 210–221.
- Palmer, P. J., Zajonc, A., & Scribner, M. (2010). *The heart of higher education: a call to renewal : transforming the academy through collegial conversations* (1st ed.). San Francisco: Jossey-Bass.
- Patall, E. A. (2013). Constructing motivation through choice, interest, and interestingness. *Journal of Educational Psychology*, 105(2), 522–534. <https://doi.org/10.1037/a0030307>; [10.1037/a0030307.supp](https://doi.org/10.1037/a0030307.supp) (Supplemental)

- Patall, E. A., Cooper, H., & Robinson, J. C. (2008). The effects of choice on intrinsic motivation and related outcomes: A meta-analysis of research findings. *Psychological Bulletin*, *134*(2), 270–300. <https://doi.org/10.1037/0033-2909.134.2.270>
- Priniski, S. J., Hecht, C. A., & Harackiewicz, J. M. (2018). Making learning personally meaningful: A new framework for relevance research. *The Journal of Experimental Education*, *86*(1), 11–29. <https://doi.org/10.1080/00220973.2017.1380589>
- Renninger, K. A. (2009). Interest and identity development in instruction: An inductive model. *Educational Psychologist*, *44*(2), 105–118. <https://doi.org/10.1080/00461520902832392>
- Rogers, C. R. (1983). *Freedom to Learn for the 80's*. Columbus, OH: Charles E. Merrill.
- Rutherford, A. (2009). *Beyond the box: B.F. Skinner's technology of behavior from laboratory to life, 1950s-1970s*. Buffalo; Toronto; University of Toronto Press.
- Ryan, R. M., & Deci, E. L. (2009). Promoting self-determined school engagement: Motivation, learning, and well-being. In K. R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school* (Vols. 1–Book, Section, pp. 171–195). New York: Routledge.
- Ryan, Richard M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54–67. <https://doi.org/10.1006/ceps.1999.1020>
- Skinner, B. F. (1961). Teaching machines. *Scientific American*, *205*(5), 90–106.
- Skinner, B. F. (1976). *About Behaviorism*. New York: Vintage Books.
- Tao, V. Y. K., & Hong, Y. (2014). When academic achievement is an obligation: Perspectives from social-oriented achievement motivation. *Journal of Cross-Cultural Psychology*, *45*(1), 110–136. <https://doi.org/10.1177/0022022113490072>

- Urduan, T., & Turner, J. C. (2005). Competence Motivation in the Classroom. In A. J. Elliot, C. S. Dweck, A. J. Elliot (Ed), & C. S. Dweck (Ed) (Eds.), *Handbook of competence and motivation*. (pp. 297–317). New York, NY, US: Guilford Publications.
- Uttal, W. R. (2000). *The War between mentalism and behaviorism: On the accessibility of mental processes*. Mahwah, N.J: L. Erlbaum Associates.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92(4), 548–573. <https://doi.org/10.1037/0033-295X.92.4.548>
- Weiner, B. (2010). The development of an attribution-based theory of motivation: A history of ideas. *Educational Psychologist*, 45(1), 28–36. <https://doi.org/10.1080/00461520903433596>