Educational Psychology

A History of Research Trends from 1970 to 2020

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The purpose of this study was to evaluate and thematically synthesize educational psychology and counseling research over the last 50 years. We used bibliometric measures to identify the top 20 articles for each decade, from 1970–2019. We then systematically reviewed and coded each article, looking for thematic trends. Themes for each decade were discussed in detail. Some of these major themes included schema theory in the '70s, self-efficacy and self-regulation in the '80s, cognitive load in the '90s, motivation in the 2000s, and student learning outcomes in the 2010s. A preliminary discussion about where the field is going during the 2020s is also included. While some themes were decade specific, we found that several themes spanned the entire 50 years. Those themes included the following: (a) teachers; (b) self-concept, self-efficacy, and self-regulation; (c) motivation; (d) measurement tools and statistical processes; and (e) cognitive load. Taken together, the field of educational psychology and counseling has evolved and shifted over the last 50 years with the research bearing evidence of important themes across time.

Psychology and counseling have existed as fields of research for hundreds of years. However, educational psychology and counseling did not exist as a distinct field of study until recently. In fact, it was not until 1931 that the British Journal of Educational Psychology was established. The Journal of School Psychology was established years later in 1963. While educational psychologists and counselors existed in Britain and other parts of the world prior to these dates, they were reliant on research from other related disciplines to inform their practice. The development of these field-specific journals was a milestone that "signaled the commitment of the specialty of school psychology to wean itself from other's [sic] scholarship and to establish scholarship that drew more heavily on its own literature" (Liu & Oakland, 2016, p. 105). Many other educational and school psychology journals were developed soon after, including Contemporary Educational Psychology in 1976, School Psychology Quarterly in 1986, and Educational Psychology Review in 1989.

Since 1931, the field of educational psychology and counseling has grown and developed as a distinct area of scholarship. A handful of attempts have been made to summarize the research using bibliometric and scientometric analysis. Three such articles provide insights into educational psychology literature but are limited due to their focus on either just one journal or just one topic each. Jennings et al. (2008) conducted a bibliometric analysis of School Psychology International from 1995–2007, and Mitchell and McConnell (2012) analyzed Contemporary Educational Psychology from 1995–2010. Jennings et al. examined citation and author trends. In contrast, Mitchell and McConnell focused on thematic and theoretical trends in the articles published during the 16-year period. According to their analysis, the most common topics in articles published in Contemporary Educational Psychology from 1995–2010 were motivation and academic subjects, particularly reading and math. Mitchell and McConnell (2012) also reported that the theoretical perspectives most often discussed in Contemporary Educational Psychology were cognitive and social cognitive theories.

More recently, Graves et al. (2020) published a bibliometric study in which they extended their analysis to a total of nine educational psychology journals; however, they focused strictly on the singular topic of social justice. Thus, while the article provides unique insight on a relevant topic in educational psychology, it does not give a comprehensive view of the field as a whole.

A few other studies have attempted more comprehensive analyses of educational psychology and counseling literature and are summarized here.

Price et al. (2011) reviewed five educational psychology journals and identified the top 100 most cited articles of all time and the top 25 most cited articles from the previous decade (2000–2010). They specifically analyzed article type and content topics. Price et al. (2011) reported that these articles were 50% qualitative and 50% narrative, with no quantitative studies represented. Six broad content categories were identified: (a) 23 assessment articles, (b) 27 intervention articles, (c) 29 explicative articles ("Explicative articles describe the relations between two or more phenomena or variables" [p. 65]), (d) 12 professional issues articles, (e) 10 consultation articles, and (f) one other article. While similar to our present study, one weakness to be considered is that identifying the most cited articles of all time favored more recent articles to historic ones; thus, articles published prior to 1990 would have been underrepresented in Price et al.'s analysis.

Kranzler et al. (2011) conducted a somewhat similar study researching the publications of school psychology program faculty from 2005–2009. They did not limit their study based on journals; rather, they selected publications by faculty from 59 selected school psychology programs. The majority of their analysis focused on faculty scholarship, but they included a brief discussion on the topics most represented. Similar to Price et al. (2011), they found the majority of the articles could be categorized as professional issues, intervention, assessment, and consultation (Kranzer et al., 2011).

Finally, Liu and Oakland (2016) completed a scientometric analysis of all the articles referencing "school psychology" from 1907–2014. Using this data, they identified 4,806 scholars authoring 3,260 articles in 311 journals. The most prominent publishers and various citation relationships were discussed in depth. Liu and Oakland briefly discussed relationships between the most highly cited articles. These relationships are very similar to those mentioned by Price et al. (2011) as "the top 15 most highly cited articles in this study, are also included in Price et al.'s list" (Liu & Oakland, 2016, p. 118).

Our study builds on and adds to the existing literature by providing a deeper, topical analysis of the research in the field of educational psychology over the last 50 years from 14 journals. We identify and discuss trends and themes associated with the 20 top cited articles for each decade from 1970–2019, with a short section dedicated to the top trends in 2020 and moving forward. Of the 14 journals represented, three are broadly related to the fields of educational psychology and counseling: (a) Journal of Counseling Psychology, (b) Counselor Education and Supervision, Learning and Individual Differences, and (c) Journal of Counseling and Development. The majority and remainder of journals are specifically educational psychology journals, including the five listed at the beginning of this chapter. A complete list of the journals utilized in our analysis can be found in the Appendix A. A more thorough explanation of our analysis methods can be found in the "Methodology" chapter of this book.

1970s: Motivation, Teachers, Math Anxiety, and Schema Theory

The top articles in this decade centered around four main themes: motivation, the impact of teachers, math anxiety, and schema theory. We saw schema theory and motivation develop as themes throughout almost every decade of top cited articles in this chapter. Other topics from research in the 1970s touched on the role of randomized control trials in education psychology, how to properly determine interrater reliability, and how to improve the happiness of students.

Motivation, Effort, and Attribution of Students

The second-most cited article from the 1970s explored a topic that was discussed by two other articles in our analysis: motivational underpinnings of students in a classroom. In this article, Weiner (1979) elaborated on the attributional theory of motivation and how it related to different situations that students may face in the classroom. Attribution theory focuses on a learner being able to look back and understand why success did or did not occur. There is a direct connection between a student's future motivation and what they attribute to their success or failure as a learner in the classroom. If a student perceived they failed due to lack of effort, then they may be more motivated to try again because they believe they can adjust the effort variable. If the cause of failure is believed to be external to the learner, then the learner's motivation will decrease substantially. This theory was meant to augment the contemporary theories of motivation that primarily focused on pleasure seeking and pain avoidance.

Another top article went into more detail on effort and how it played into student–teacher interactions and student motivation. "Effort: The Double-Edged Sword in School Achievement" (Covington & Omelich, 1979) discussed the way that effort affected student–teacher interaction and student achievement in a classroom. According to Covington and Omelich, teachers tend to praise and place a high value on effort and even threaten students if they do not try. For students, however, effort can have a large impact on how they feel about themselves and their self-confidence. If students exert significant effort and still do not succeed, then they infer low ability in themselves and feel discouraged. However, if they do not try hard and do not succeed, then at least they can use their lack of effort as an excuse. Thus, students sometimes may not give their best effort to preserve their sense of self-worth.

Two other articles touched on similar topics. One evaluated a chicken-or-the-egg question in academic performance and found that academic achievement clearly precedes a student's evaluation of their ability, rather than the other way around (Calsyn & Kenny, 1977). The other article evaluated the logic of student attributions at different age levels and found that as students mature in elementary school their attributions of failure or success become more logical (Nicholls, 1979).

Teachers

Research in the 1970s was important for understanding the impact of teachers. Previous research centered around the idea that academic achievement was "determined by factors within students, little if at all by teachers" (Brophy, 1979, p. 733). This belief started to change throughout the decade as more and more researchers demonstrated that how a subject is taught can have as much significance as the subject matter. Teachers have an important role to play, but it can be difficult to fully understand that role given the myriad variables at play in any given classroom. Brophy attempted to navigate many of these variables and give direction to the field on how to approach research given the changed landscape of education. To do this, Brophy argued effective compilations of research and data need to be made, and eventually generic conclusions about teaching in a classroom need to lead to specific studies designed within specific contexts.

One of Brophy's (1979) discussed variables was teacher expectations on classroom performance. Brophy and Good (1970) studied the interactions of teachers and students in four different first-grade classrooms. The observations focused on the behavior of the teachers and the students. They noticed that some of the differences between the behaviors of various teachers was caused by student behavior, while other differences in teacher behavior could not be attributed to the behavior of the students. Teachers gave the greatest praise to students whom they had the highest expectations of. Brophy and Good concluded that teacher expectations of students are in some ways self-fulfilling prophecies.

Measurement: Math Anxiety

Two articles discussed the introduction and subsequent use of a scale designed to measure the level of anxiety students experience with learning math. The first article explained how a psychometric test (called the Mathematics Anxiety Scale) was developed that demonstrated internal reliability and predictability when it came to measuring the level of anxiety a student felt about math (Richardson & Suinn, 1972). A follow-up article in 1978 sought to understand how common math anxiety is among college students using the Mathematics Anxiety Scale (Betz, 1978). That study found that math anxiety is relatively common among college students but also noted that it is more prevalent among certain subgroups of students, such as women and students who did not have as much math education in high school.

Schema Theory

During the 1970s, schema theory became more developed and robust, which is reflected in the sixth- and seventh-most cited articles. Schema theory states that when learners are introduced to new material they must assimilate it into their preconstructed understanding of a subject or broader understanding of the world. Wittrock (1974) discussed a model that can be used to try to better understand human learning. Learning, as proposed by the author, is better understood when looking through the lens of the previous knowledge of the learner. Learners generate understanding and recall from what they construct of the material learned and how it fits into the bigger schema that the learner has already preconstructed in their brain.

This concept was later tested by Pichert and Anderson (1977). Their study tested how well college students remembered different elements of stories based on the perspective they were given in reading the story. The results showed that the perspective the students were given influenced their recall of particular ideas. That is, the perspective of the student determined the importance of the ideas. This meant ideas are not important in and of themselves but rather are important depending on the perspective the person brings to the text.

Other

The most often cited article from the 1970s was "Estimating Causal Effects of Treatments in Randomized and Nonrandomized Studies" (Rubin, 1974). It has been cited in almost three times as many instances as the second-most cited article, with 3,345 citations as of the writing of this chapter. This article addressed some of the criticisms that had been levied against the field of education psychology—mainly, that the field does not utilize randomized control trials as much as it should. The authors argued that there is merit in randomized control trials, but in many instances such trials are not feasible. Given the meta-issue addressed in this article, it is logical that it is still frequently cited. However, it is the only top-20 article that addressed this topic. Authors who cited this article list it as one of the founding arguments making the case for exceptions to randomized control trials and how to work with situations where randomized control trials are not feasible (Holland, 1986).

Other top articles from the 1970s introduced and developed many other important subjects that are prevalent in today's understanding of learning. Methods for calculating interrater reliability and agreement were more fully developed (Tinsley and Weiss, 1975), and the first psychological study designed to improve human happiness among college students was also conducted (Fordyce, 1977). These topics, as well as the themes mentioned above, are a reflection of larger trends that took place during this decade.

1980s: Self-Concept, Self-Efficacy and Self-Regulation, Motivation and Goals, Longitudinal Studies, and Measurement Tools

In comparison to the 1970s, the most cited articles from the 1980s focused less on the impact of teachers (though there were still some articles in the early '80s with that theme) and more on the impact of the individual, their sense of self, and their performance. Self-concept, self-efficacy, self-regulation, and self-motivation were prominent topics

among the most cited articles of the '80s. There were also a number of highly cited articles covering longitudinal studies as well as articles aimed at advancing various measurement and analysis tools.

Self-Concept

Throughout the '80s, many authors, but particularly Marsh, sought to study self-concept and its impact in various areas. In the mid-'80s, Marsh and Shavelson (1985) focused broadly on breaking down the multiple areas of self-concept by compiling existing research. The factors considered and rated in their effects on an individual's self-concept were verbal skills, problem solving, appearance, parents, religion, and emotional stability, along with various other factors.

Later, Marsh (1987) aimed to investigate the practicality of the "big-fish-little-pond effect" (the BFLPE) in students. In this longitudinal analysis, he focused on children's academic self-concept and subsequent academic performance. Marsh was able to use the BFLPE to conclude that a student's academic self-concept could be shaped positively or negatively depending on whether they were placed in a higher or lower ability school. For example, an average student placed in a high ability school was at risk for developing poor self-concept and performing poorly academically.

Towards the end of the '80s, Marsh (1989) published a widely cited study analyzing how gender and age shape self-concept in preadolescents. He found that self-concept declined in middle-adolescence through early adulthood. According to Marsh (1989), younger children's self-concept is unreasonably high, and the subsequent decline in self-concept is a naturally occurring process as children become more aware of themselves in relation to their environment. Self-concept was also observed to increase again in adulthood (Marsh, 1989).

Self-Efficacy and Self-Regulation

Two more popular themes from the '80s, self-efficacy and self-regulation, attracted various authors. Towards the beginning of the decade, Betz and Hackett (1981) investigated the applicability of Bandura's self-efficacy theory and sought to apply it to the career decision-making process for women in particular. The authors found that women reported lower self-efficacy in regards to traditionally male positions such as engineer, accountant, mathematician, and police officer. In contrast, women reported higher self-efficacy in traditionally female positions such as elementary teacher, dental hygienist, and secretary. The authors concluded that self-efficacy could influence career development. Betz and Hackett recommended the development of programs aimed at increasing self-efficacy in women regarding traditionally male jobs.

Self-efficacy in teachers became the topic of Gibson and Dembo's 1984 article. The authors aimed to develop an instrument to measure teachers' self-efficacy and study it in relation to observable teacher behaviors. High- and low-efficacy teachers were divided up based on this measurement tool. The authors observed that low-efficacy teachers spent more time in small groups, intellectual games, and giving feedback in the form of criticism. Low-efficacy teachers also lacked persistence in helping the student figure out answers for themselves. High-efficacy teachers, in contrast, spent less time in small groups, more time preparing paperwork, and did not give any feedback in the form of criticism. High-efficacy teachers were also more likely to persist in getting a student to an answer, rather than just giving them the answer, for example.

Also in 1984, Salomon published an article investigating television versus print as learning media. The author sought to understand whether the medium affected the individual in terms of the amount of invested mental effort (AIME), perceived self-efficacy, and subsequent achievement. The author reported that individuals with higher levels of self-efficacy expended less mental energy and achieved less when presented with television content. On top of that, children, in general, felt more efficacious with television content as a whole. Thus, Salomon (1984) concluded television content could be assumed to be "too easy" in comparison to print media in providing effective learning experiences.

In the late '80s, Zimmerman (1989) sought to determine the effects of the following variables in the self-regulation of K–12 students: (a) self-efficacy, (b) self-observation, (c) self-judgment, (d) self-reaction, (e) personal influence, (f) behavioral influence, and (g) environmental influence. The author found that telling students the group before them had completed X amount of problems or recommending that students complete X amount of problems resulted in students

displaying higher self-efficacy and performing better than the control group. Furthermore, children who were encouraged to self-record reported higher self-efficacy than the control group. Additionally, Zimmerman (1989) found that a child's selection of learning strategies determined whether they would continue to self-regulate via those learning strategies.

Finally, Grolnick (1989) authored an article focusing primarily on self-regulation. Grolnick (1989) sought to evaluate parental style and its subsequent influence on children's self-regulation. The author assessed multiple variables, and key factors emerged. Areas such as combined parental support of autonomy positively correlated with children's self-regulation and, additionally, appeared to help keep children from acting out in school. Grolnick also noted that a healthy parent-to-child control balance was necessary for children's own internal regulation.

Motivation and Goals

Similar to the 1970s, the '80s were still concerned with motivational factors and the structuring of goals. In 1983, Paris et al. (1983) examined the motivational factors they deemed critical to an individual becoming a "strategic reader." The authors determined that the personal significance of the goal, its meaningfulness, the social contexts of setting the goal, and the intentions of the goal-setter were important factors in self-guided and self-motivated learning.

Five years later, Meece et al. (1988) analyzed students' cognitive engagement as related to science activities. According to the authors, students who were motivated to focus on goals around task-mastery reported being cognitively engaged. In contrast, students who aimed to achieve goals centered around social recognition or avoiding excess work reported being less cognitively engaged. Therefore, motivational goals centered around task mastery would lead to greater cognitive engagement. The authors further linked these results to the students' self-motivation and enthusiasm for science.

Also in 1988, Ames and Archer (1988) sought to understand the effects of mastery goal orientation (attaching importance to learning a new skill) vs. performance goal orientation (attaching importance to ability to succeed) in instruction. According to the authors, mastery goal orientation resulted in students "using more learning strategies, preferring tasks that offered challenge, and having a more positive attitude towards their class" (p. 263). Performance goal orientation, on the other hand, was linked to mildly negative "self-perceptions of ability" (p. 263). The authors' findings indicated that classroom environments emphasizing mastery positively changed the way that students approached tasks and engaged in learning.

Lastly, we give a special note to the 1984 study conducted by Solomon and Rothblum (1984) investigating procrastination. In a study of the antithesis of motivation, the authors aimed to discover the reasons for procrastination and frequency of procrastination among college students. According to the authors, factors such as fear of failure and aversiveness of task were the main reasons accounting for procrastination. These factors also correlated with self-reported depression, anxiety, low self-esteem, and other similar mental disorders.

Longitudinal Studies

Of the 20 most cited articles of the '80s, two were longitudinal studies. Juel's (1988) study tracked the reading development of a group of students from first through fourth grade. Juel aimed to find out whether children remain poor readers and poor writers over the span of multiple years. The author also intended to determine what skills poor readers lack and what factors keep poor writers from improving. According to Juel, a child's poor reading ability at the end of the first grade was a reliable indicator of the child continuing to remain a poor reader by the fourth grade. Additionally, there was a tendency for poor readers to become poor writers. In terms of influential factors, entering the first grade with little phonemic awareness was a common factor among the poor reader group.

In the second longitudinal study of the list, Gottfredson (1981) focused on four different life stages and evaluated how an individual's evolving self-concept affected their occupational aspirations. The various stages that Gottfredson observed were "orientation to size and power (ages 3–5 years), orientation to sex roles (ages 6–8 years), orientation to social valuation (about ages 9–13 years), and orientation to the internal, unique self (beginning around age 14 years)"

(p. 545). According to the author, a child's sense of self-concept (in relation to their gender and level of prestige) and subsequent career aspirations begin to set in by age 13. And, after age 13, adolescents experience difficulty in deciding what career options to pursue. This is due to the fact that they have little idea of what they like to do or what they are good at. Therefore, the author suggested career counseling take place earlier in the child's life and adolescents be assisted in discovering careers and skills through self-discovery tools.

Measurement Tools

Various measurement tools were introduced in this decade. In the early '80s, Rosenthal and Rubin (1982) introduced the binomial effect size display (BESD). This tool was aimed to more accurately account for changes in success rate as "attributable to a new treatment procedure" (p. 166). Also in 1982, Heppner and Peterson investigated the validity and application of the problem-solving inventory (PSI), which, according to the authors, was "a 6-point, Likert-type format of 35 items constructed by the authors as face valid measures of each of the five problem-solving stages, based on a revision of an earlier problem-solving inventory" (p. 67). The authors further suggested that the PSI may be useful as an indicator of an individual's perception of the problem solving process and their ability to conceptualize ways to solve hypothetical problems.

Tinsley and Tinsley (1987) furthermore introduced the factor analysis technique with the goal of explaining the maximum amount of variance using the least amount of "explanatory concepts." Lastly, Horvath and Greenberg (1989) authored an article on the Working Alliance Inventory (WAI), which measured client counselor relationships. Study data suggested that the WAI demonstrated promise in early prediction of successful counseling outcomes. However, its validity, reliability, and utility were still in the early stages.

1990s: Self-Efficacy, Motivation, Schemas, Cognitive Load, Counseling Relationships, and Knowledge

Some of the major themes in the 1990s included self-efficacy, motivation, cognitive load (which was grouped with similar topics such as schemas and working memory), counseling relationships, and knowledge. This continued the trend of self-efficacy from the 1980s while bringing in more work on counseling and relationships, cognitive load, and motivation.

Self-Efficacy

Self-efficacy, according to Bandura (1993), is the belief in one's own ability to excel in academic activities through the use of various cognitive strategies. These strategies are determined by the degree to which the learner is motivated, their goals, and their previous academic record. Has the student accurately predicted in the past how well they will do on an assignment? Did an employed strategy help the student to feel that they performed well on a specific activity? Having high self-efficacy helps learners exert more control over their own learning. With this quasi-definition in mind, Bandura and several others wrote well-cited articles regarding self-efficacy and self-regulation, including the article with the most overall citations from this decade by Pintrich and de Groot (1990). This empirical study researched the three components that make up self-regulation: student metacognition, student self-management, and control of one's own effort in the classroom. Tips and tools were brought up that can help students to develop strategies to help with their learning processes.

Most of the other articles in this theme are theoretical. Blumenfeld et al. (1991) discussed the implementation of problem-based learning as well as offering help to those who are looking for the motivation to sustain that implementation. Elliot (1999) expounded on approach and avoidant motivations and whether or not these should be included in the conversation on achievement goals when it comes to performance goals. Zimmerman (1999) explored the interplay between motivation and self-efficacy. Schunk (1991) also discussed the interplay between self-efficacy and motivation when writing about the academic motivations of students. Self-efficacy continued to be an important theme in the field of educational psychology as researchers focused on students and student-centered learning.

Motivation

Motivation continued to be a theme in the literature. As mentioned above, Schunk (1991) discussed the impact of different types of motivation (approach and avoidant) on the goals that a student sets. Blumenfeld et al. (1990) discussed problem-based learning and how to implement, sustain, and motivate its use in the classroom. Skinner and Belmont (1993) studied the relationship between the teacher's classroom (i.e., structure, involvement, and autonomy) and student engagement, both in behavior and emotion. Deci et al. (1991) reviewed existing literature to see the role of motivation in the classroom, how it is created, and what types of motivation exist. Zimmerman (1990) and Schunk (1991) were both mentioned in the section on self-efficacy and wrote about similar facets of the interplay between motivation and self-efficacy. They both focused on how self-efficacy can play a role as a motivator in academic settings. The final study on motivation in the top 20 was based on an experiment conducted by Cordova and Lepper (1996) in which they analyzed the effects of personalization and contextualization on the learning of students who were practicing mathematical problems on the order of operations.

Cognitive Load

Several '90s articles spoke of creating schemas to help with working memory and reducing cognitive load, including the most highly cited article of the 1990s: Sweller et al.'s (1998) theoretical article is an explanation of working memory and how it can be improved through the use of schemas to lower the cognitive load for those who are learning new tasks or skills. This article was cited an average of nearly 120 times per year.

Other articles that fell under this theme included Bandura's (1993) article that researched how an individual's perception of their own self-efficacy played a role in their cognitive development at various stages of development. Bandura noted that those with higher self-efficacy were faster to discontinue the use of ineffective strategies, and this happened from a very young age. Those who did this were able to perform better overall and to learn more. A study in the Netherlands (Paas, 1992) explored the effects of cognitive load and schemas on the ability of students to: (a) solve a problem from the beginning, (b) complete a problem that had already been partially worked, or (c) understand and check a problem that had already been completed. Paas concluded that creating frameworks or schemas aided in the acquisition of new skills by reducing the cognitive load placed on the students from those skills. This left more room in the working memory to make adjustments, transfer other useful pieces of information, and use the schema as a foundation to learn more.

Counseling Relationships

There were also three top cited articles that covered relationships and counseling in this decade. Sue (1992) primarily studied counseling and the education that goes into the preparation of counselors. The article advocated for greater inclusion of multicultural perspectives in these preparation programs. According to Sue, diverse perspectives are often not taught or even mentioned during the education of counselors, so professionals are not being adequately prepared to build relationships and help others after they graduate. There were also articles that discussed the relationship between counselor and client (Horvath & Symonds, 1991) as well as that of teacher and student (Birch & Ladd, 1997). Horvath (1991) did a meta-analysis on the relationship dynamic between the therapist and patient, specifically researching the interplay between the two. Along similar lines, Birch and Ladd (1997) explored student- and teacher-reported relationships. They specifically studied a student's feelings for school and their relationship with the teacher on three scales: warmth, dependency, and conflict. Wentzel (1998) also used student and teacher surveys to analyze a student's relationship between their school performance and their relationship with teachers, parents, and peers. In each case, they found that having a strong positive relationship with parents, peers, and teachers was important because these relationships impacted different behaviors in the student.

Knowledge

Knowledge was a minor theme since a few empirical studies focused on the acquisition of and different types of knowledge. Schommer (1990) built on Perry's (1968) different dimensions of knowledge. Perry built those dimensions of knowledge as a linear model, while Schommer structured a model that was built on each dimension increasing at its

own rate. Schraw and Dennison (1994) wrote an article on their attempts to validate their inventory on metacognition. Their initial intention was to test the eight processes that are components of knowledge and self-regulation. Those eight components were very similar to those mentioned by Schommer (1990) earlier in the decade. Both articles reviewed the different types of knowledge that could be obtained and how such knowledge could be structured, controlled, and made accessible to students. In the case of Schraw and Dennison (1994), the study validated their Metacognitive Awareness Inventory and also included investigations into how certain strategies used by students were necessary to regulate that knowledge.

Other

There were only two articles that did not fit within any of the themes discussed above. Ames (1994) wrote a theoretical paper that discussed the perception of students in the classroom and the role that those perceptions played in their learning. Ames researched the perceptions of students regarding the structure of the classroom and encouraged teachers to move toward a mastery orientation to learning. This was the fourth-most cited article of the decade. The eighth-most cited article was a theoretical work by Wolf and Bowers (1999) in which they proposed a new concept, that of the double deficit, regarding reading dysfunctions in dyslexia.

2000s: Motivation, Cognitive Load, Problem-Based Learning, and Student Emotions and Counseling Psychology

The top two themes for the 2000s were student motivation and cognitive load. Other themes were student emotions in a school setting, problem-based learning, and counseling psychology. Motivation was the most prominent theme with six out of the top 20 articles addressing some aspect of student motivation, one of which is the most cited article of the decade. The two articles on student emotions are so closely connected to motivation that it is almost hard to distinguish them from the six discussing motivation. Nevertheless, because they attempt to focus on emotions over motivation exclusively, we have separated the themes for the purpose of this chapter.

Motivation

As mentioned in previous decades, the topic of motivation is a recurring theme through education psychology research. However, unique to this decade is that motivation was overwhelmingly the primary theme of the top 20 most cited articles.

The top cited article of the decade is called "Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions" (Ryan & Deci, 2000). This article has received 6,133 citations as of this writing. In this article, the authors described the current understanding of intrinsic and extrinsic motivation and the superior regard for intrinsic motivation that seemed to exist in the field. However, the authors argued, there are different types of extrinsic motivation, and it is not proper to lump all types of extrinsic motivation together. The best types of extrinsic motivation were those where the learner identified with the subject and endorsed its importance and those where the learner integrated the topic with his or her other knowledge. When students grasped the meaning and importance of a topic they were much more likely to identify with it and integrate it into their own knowledge. Learning is much more effective when it supports the needs of students to (a) feel connected to others, (b) feel competent, and (c) determine their course of action.

In the same year Ryan and Deci's (2000) article was published, Wigfield (2000) published a top cited article about the expectancy-value theory of motivation. This theory purported that students made decisions based on the expected potential rewards that could result from the decision. The article defined the important components of this theory's model and compared those components to the concepts of self-efficacy, intrinsic and extrinsic motivation, and interest. The author also reviewed longitudinal studies about how children value different activities over time, concluding that over time, children's views and beliefs generally declined from a more optimistic belief in their earlier years.

Hidi and Renninger (2006) later introduced a process by which interest is generated in a topic. The authors argued that interest started with triggered situational interest and then became maintained situational interest. After maintained

situational interest, individual interest could emerge and then potentially turn into a well-developed individual interest.

The other three articles discussed other topics related to motivation. The 15th-most cited article reviewed the motivational research regarding seven important questions related to motivation and education (Pintrich, 2003). The following year, Pintrich (2004) published another often-cited article that introduced a new way of understanding motivation. Their model was based on qualitative interviews with students rather than top-down theories. The model focused on a self-regulatory perspective rather than a student approach to learning perspective. The 19th-most cited article was published in 2000, reviewing and reinforcing the concept of self-efficacy (Zimmerman, 2000).

Cognitive Load

The second-largest theme of the 2000s is cognitive load. Three articles focused on different components of cognitive load. The major subthemes were (a) ways to reduce cognitive load and (b) the importance and potential of measuring cognitive load to advance the theory. All three of the articles came from the same volume of the same journal in 2003, a special issue focusing solely on cognitive load (Mayer & Moreno, 2003; Paas et al., 2003a, 2003b). The 20th-most cited article (Paas et al., 2003) was, in fact, an introduction to this journal volume, summarizing the developments of cognitive load to date and the topics addressed in that journal volume.

The eighth-most cited article, "Nine Ways to Reduce Cognitive Load in Multimedia Learning" (Mayer & Moreno, 2003), was a straightforward article that addressed the challenge of cognitive load and strategies for its reduction. The strategies were based on the foundational components of cognitive load (i.e., that our brains have two separate channels for processing multimedia content—hearing and sight—and that each channel has limited bandwidth for new information).

An additional article pointed to the need for measurements of cognitive load (Paas et al., 2003). The authors posited that if cognitive load was going to continue as a valid theory, then effective measurement strategies were needed. Without this, the theory of cognitive load would not be able to establish an empirical basis.

Problem-Based Learning

Problem-based learning was focused on in three of the top 20 articles. Two of the articles represented opposite sides of a debate about minimal guidance instruction and its effectiveness (Hmelo-Silver et al., 2004; Kirschner et al., 2006). In the second-most cited article of the decade, "Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching" (Kirschner et al., 2006), the authors conducted a study that combined problem-based learning with minimal guidance instruction and stated that the evidence showed that minimal guidance instruction did not work. The 13th-most cited article was a response to this and argued that problem-based learning should not be categorized as minimal guidance instruction due to the amount of scaffolding present (Hmelo-Silver et al., 2007). The authors then presented evidence that problem-based learning was a very effective method of achieving learning outcomes as well as helping students develop other important skills along the way.

The fifth-most cited article was a literature review covering the current knowledge and understanding of problem-based learning as of 2003 (Hmelo-Silver et al., 2004). The authors outlined how problem-based learning had potential to develop students' abilities to (a) gain knowledge that is flexible, (b) develop self-directed learning skills, (c) improve their abilities in problem-solving, (d) become intrinsically motivated, and (e) improve students' skills in collaboration. The first three abilities had been demonstrated in research, while the latter two were lacking in support.

Student Emotions and Counseling Psychology

The other two ancillary themes of the decade were student emotions and topics related to counseling psychology. For student emotions, the articles focused on summarizing fragmented research about student emotions and creating a taxonomy of emotions that were experienced by students in an academic setting (Pekrun, 2006; Pekrun et al., 2002). Both articles pointed to the need for further research in this area in order for it to develop into a robust field of study.

The two articles regarding counseling psychology research both focused on research constructs. One focused on the difference between moderator and mediator effects, while the other focused on how to discern quality and trustworthiness of qualitative studies in counseling psychology (Frazier et al., 2004; Morrow, 2005).

Other

There were four articles in the top 20 that did not fit into any of the aforementioned themes. One of the articles developed a more robust method for assessing the extent to which a person has meaning and purpose in their life (Steger et al., 2006). Other topics addressed were consensual qualitative research (Hill et al., 2005), teacher burnout and work engagement (Hakanen et al., 2006), and spatial ability within Science, Technology, Engineering, and Mathematics (STEM) subjects (Wai et al., 2009).

2010s: Student Learning Outcomes, Best Statistical Practices, Instructional Technology, Teachers, and Cognitive Load Theory

A few novel themes emerged from 2010–2019, including student learning outcomes, best statistical practices, and instructional technology. However, teachers re-emerged as a dominant theme, continuing the trend from the 1990s and 2000s, and cognitive load theory remained a prominent topic in the literature. Only one of the most highly cited articles of the decade did not seem to fit into any of the main topics mentioned above. This article reviewed the gender gap in STEM fields. Wang and Degol (2017) summarized the most recent research associated with six possible explanations for this gender gap: (a) cognitive ability, (b) relative cognitive strength, (c) occupational interests or preferences, (d) lifestyle values or work–family balance preferences, (e) field-specific ability beliefs, and (f) gender related stereotypes and biases. The authors also discussed implications for practice and future research directions.

Student Learning Outcomes

Of the 20 most cited articles of the 2010–2019 time period, nine articles focused on student outcomes as the dependent variable. Six of these articles focused solely on student learning outcomes; however, three articles looked beyond learning outcomes and also included behavioral, psychological, or social outcomes. Throughout these articles, student learning outcomes were primarily discussed in terms of academic achievement and measured using a student's grade point average.

Notably, the independent variables in nearly all of these articles were contextual or external to the student. In other words, researchers during this decade were focused on improving student outcomes, but they approached this with the acknowledgment that many factors contributing to or limiting student success were outside of the students' control. The main purpose of these studies was to better understand the nature of the relationships between student learning outcomes and these external variables. While the majority of authors tentatively discussed implications for practice at the end of their articles, no specific or intentional interventions were being studied or proposed. The contextual or external factors studied as independent variables during this decade included the following: teacher support and structure (Jang et al., 2010), instructional methods (Alfieri, 2011), engagement strategies (Pekrun, 2011), classroom emotional climate (Reyes et al., 2012), school climate (Wang & Degol, 2016), and teacher competence (Kunter et al., 2013).

The only student-specific independent variables studied in relation to student outcomes were student engagement (Chi & Wylie, 2014), student executive function (Best et al., 2010), and student mindset (Yeager & Dweck, 2012). However, even when studying factors that are arguably in students' control, the focus of the research was on implications for teaching and instruction. For example, in the third-most cited article of the decade, Chi and Wylie (2014) introduced a new student engagement framework that delineated four different modes of student engagement, ranging from most impactful to least impactful on student learning. While these forms of engagement were measured based on student behavior, the focus of the study was not on what students could do to become more engaged; rather, the researchers

were primarily concerned with instructional strategies teachers could employ to elicit the highest levels of student engagement behaviors—namely, dialoguing and constructing.

Another example of this comes from the fourth-most cited article of the decade on student mindset and resilience. Here, Yeager and Dweck (2012) introduced the idea that what students believe about their (and others') intellectual abilities and social attributes impacted their achievement, stress, and aggression in certain settings. Again, the bulk of discussion about the implications for these findings surrounded the idea that educators and parents can shape student mindsets—for better or for worse. Unlike other articles from this decade, Yeager and Dweck (2012) did discuss specific implicit theory intervention practices that were appropriate for helping students develop healthy mindsets. Taken together, the literature during this decade gave us additional considerations and insights into how to support student learning outcomes.

Statistical Processes

Missing Data

The second- and tenth-most cited articles of the decade were published in 2010 and addressed the same topic: missing data practices. One was published in the Journal of Counseling Psychology and the other in the Journal of School Psychology. The article written by Schlomer et al. (2010) established this as an issue worth addressing in the field when they reported that only 14 of 37 quantitative studies in the most recent volume of Journal of Counseling Psychology reported any missing data at all. Of those, 11 used deletion as their method of handling missing data.

According to the authors in both studies, deletion methods, as well as single imputation and mean substitution methods, were "poor" (Schlomer et al., 2010, p. 6) and "archaic" (Baraldi & Enders, 2010, p. 33). Subsequently, both sets of authors called on school and counseling psychology researchers to replace these methods with the most up-to-date, "state of the art" approaches recommended by the American Psychological Association (APA): maximum likelihood and multiple imputation. Schlomer et al. (2010) extended an additional call to editors, imploring them to heighten their standard of missing data reporting and to "insist that missing data be attended to in quantitative articles" (Schlomer et al., 2010). While both articles discussed the advantages of maximum likelihood and multiple imputation in detail, Baraldi and Enders (2010) also provided two analysis examples for reference. These examples can be particularly helpful for researchers who have not been exposed to the newer methods of handling missing data.

Multilevel Modeling

Another best statistical practices article similarly called on school and counseling psychology researchers to become familiar with the multilevel modeling methodological approach. This article, "A Practical Guide to Multilevel Modeling" (Peugh, 2010), was intended to assist researchers in learning and applying this methodology to their work. To do so, Peugh provided a detailed, seven-step process for conducting multilevel modeling and walked through two examples.

Overall, these three articles represented a trend toward more sophisticated and regulated methods of statistical analysis and research in the field.

Instructional Technology

Three top articles of the decade reviewed and discussed innovative instructional technologies: computer tutoring, serious games, and immersive virtual reality. The computer tutoring and serious games articles were meta-analyses, whereas the immersive virtual reality article was an empirical study. All three articles discussed these technologies in comparison to traditional instructional methods.

Regarding computer tutoring, VanLehn (2011) challenged the longstanding belief that human tutoring is, in all cases, superior to computer tutoring. The meta-analysis found that when tutoring is considered based on the granularity of knowledge, rather than the mode of tutoring, human tutoring reached a plateau; at that point, certain types of computer tutoring have the potential to be superior (VanLehn, 2011). As these meta-analysis findings contradicted previous studies, further research on the topic was recommended.

The serious games meta-analysis, which was the most cited article of the decade, was concerned with the cognitive and motivational effects of serious games compared to conventional instructional methods. Wouters et al. (2013) analyzed 38 articles on serious games published from 1990–2012. Seven hypotheses were tested. Four of the seven hypotheses were confirmed, indicating that serious games yielded higher learning gains and a higher level of retention than other conventional instruction methods. These higher learning gains were further strengthened when serious games were combined with other methods of instruction and when multiple training sessions for serious games were employed. Hypotheses that were not confirmed led to three conclusions. First, serious games were not more motivating than other instructional methods. Second, students did not learn more when engaging in serious games by themselves; rather, students learned more when engaging in serious games in groups. And, finally, learning gains between serious games and passive instruction were not higher than learning gains between serious games and active instruction.

Finally, Parong and Meyer (2018) compared immersive virtual reality with PowerPoint slideshow instruction. They found immersive virtual reality to be more motivating for students than the conventional PowerPoint instruction but not more effective for teaching. While the authors acknowledged that these findings may indicate that "the conversion of multimedia lessons into virtual reality may not yet be warranted" (Parong & Meyer, 2018, p. 785), they discussed the importance of motivation on learning and recommended further research on the topic.

This research showed strides being made toward a better understanding of the use of various technologies in education. However, in all cases, further research was recommended. Thus it can be concluded that instructional technologies is an area of research that could benefit from additional study and understanding.

Teachers

Six articles had a heavy emphasis on teachers. The majority of these articles were referenced previously in the Student Learning Outcomes section, as researchers seemed primarily concerned with how teacher practices or instructional methods impacted students (Alfieri et al., 2011; Kunter et al., 2013; Reyes et al., 2012). However, there were two articles about teachers where student learning outcomes were not the main focus.

One review article specifically addressed research on teacher scaffolding over the last decade. Van de Pol et al. (2010) agreed that the research shows scaffolding to be effective, but they stated that "the measurement and analysis of scaffolding appears to be in its infancy" (p. 287). Next steps for this area of study were to find an agreed-upon definition and measurement instrument for scaffolding. Another article from this decade researched relationships between teacher self-efficacy, job satisfaction, teacher gender, years of experience, and job stress. While this was the only top cited article from the decade that was strictly teacher-focused, several key insights regarding work-related stress, job satisfaction, and self-efficacy can be gained from Klassen and Chiu's (2010) findings. For instance, this study found that female teachers had higher levels of work-related stress. Overall, work-related stress negatively impacted job satisfaction. Also related to job satisfaction was teachers' self-efficacy. Specifically, "teachers' self-efficacy for instructional strategies and classroom management positively [influenced] job satisfaction" (Klassen & Chiu, 2010, p. 747).

Cognitive Load

Two articles surrounded the topic of cognitive load theory—one theoretical piece published at the beginning of the decade and one literature review article published at the end of the decade. Sweller, an Australian educational psychologist, was the lead author of both. In the 2010 article, he added nuance to cognitive load theory when he suggested that element interactivity underlies not only intrinsic cognitive load but extraneous cognitive load as well.

Sweller et al.'s (2019) review article discussed this theoretical work, as well as many other theoretical pieces written from 1998–2018 on cognitive load theory. Furthermore, Sweller et al. comprehensively summarized the empirical research on the topic of cognitive load theory and presented possible directions for future research, although it was ultimately recommended that we "not try to predict the future but create it by continuing to do good research" (Sweller, 2019, p. 288).

2020 and Beyond: Self-Efficacy, Student Learning, Cognitive Load, and Motivation

Moving forward into the next decade, four themes continue to emerge: self-efficacy, student learning, cognitive load, and motivation. Self-efficacy was grouped together with similar topics such as self-regulation and self-determination. Several articles published in 2020 discussed how students learn and what can be done to help students to learn more effectively. Cognitive load was grouped with other topics such as working memory and seductive details theory. Motivation was a theme unto itself as researchers typically use this exact term along with other words to distinguish their meaning, such as intrinsic or extrinsic. Three other articles, including one about the effects of the COVID-19 pandemic were the last of the articles in the top 20 of 2020.

Self-Efficacy

Seven of the top 20 articles explored or explained self-efficacy or self-regulation. These included various types of articles that explored how students gained a better understanding of their own understanding and how that may impact student learning and learning strategies. Vasconcellows et al. (2020) was the most cited article of the year and dealt specifically with self-determination when it comes to physical education. Ryan and Deci (2020) explored intrinsic and extrinsic motivation from a self-determination perspective, examining their definitions and what new perspectives may arise through a self-determination theory lens. An article that fit into a few of these themes was Nückles et al.'s (2020) study, which researched how journal writing helped students learn to self-regulate and work with cognitive load. Bardach et al. (2020) conducted a meta-analysis examining achievement goal theory, looking for evidence that achievement goal theory is accurate. Kim and Burić (2020) researched the relationship between teacher burnout and the teachers' sense of self-efficacy. Van Gog et al. (2020) examined the role of mental effort while students were learning to solve problems using self-regulation strategies. De Bruin et al. (2020) created the Effort Management and Regulation Framework synthesizing cognitive load and self-regulation theory to point out an area they believe is being ignored, asking questions such as how students monitor effort.

Student Learning

Student learning covers a variety of specific topics in these articles that explore how educators can more effectively teach students. Sailer and Hommer (2020) conducted a meta-analysis on the gamification of learning. Nückles et al. (2020) explored how journal writing could help with cognitive load. Tenenbaum et al. (2020) did a meta-analysis studying the effectiveness of peer interaction in learning. Bernacki et al. (2020) examined how the use of mobile technology has changed the learning process as well as how the role of technology in education is being better understood and measured. And Bowers (2020) argued that the use of systemic phonics in reading may not be more effective than alternative methodologies. These all centered around the theme of questioning how students learn, whether it is questioning traditional practice or in considering non-traditional benefits for current practices.

Cognitive Load

Cognitive load, combined with schemas and working memory, continued to be a strong trend. As mentioned above, Nückles et al. (2020) studied journal writing as a way to help students learn self-regulation skills, particularly regarding cognitive load. Related to working memory, Sundararajan and Adesope (2020) conducted a meta-analysis on the seductive details theory, which describes and quantifies the effect of tangential details that, while nice, act as distractors from the purpose of the material. By adding in these tangential details, students are being seduced into trying to remember more than they are capable of and may lose important information. De Bruin et al. (2020), as mentioned above in the section on motivation, created a framework that pointed out how cognitive load is related to self-regulation and identified research that should be done to further explore how students use self-regulation strategies to manage their cognitive load.

Motivation

Two articles continued the trend of researching motivation: Eccles and Wigfield (2020) and Schunk and DiBenedetto (2020). Eccles and Wigfield (2020) considered expectancy-value theory from a variety of perspectives (e.g., developmental and sociocultural) to see how these perspectives would make a difference when researching situated expectancy-value theory. Schunk and DiBenedetto (2020) discussed how motivation can be understood through Social Cognitive Theory and motivation, analyzing the processes that influence goals and self-evaluations of progress.

Other

When considering trends moving into the future, there were a few articles from the top 20 that did not seem to fit into a particular theme with some of the other articles. Conoley et al. (2020) wrote a review researching how school psychology was performing and how it was lacking. Sinatra and Lombardi (2020) discussed how evaluating sources for scientific data may need to adjust. O'Brien et al. (2020) examined challenges minorities face and the degree to which the culture of ecology and evolutionary biology are inclusive.

Only one article on the coronavirus and the ensuing pandemic was included in this grouping. Kim and Asbury (2020) wrote about the impact on teachers after six weeks of being in lockdown because of the pandemic. It is expected that this will continue to be a popular theme in the short term since many teachers, students, and families tried online learning for the first time during the pandemic.

Looking to the future, there are a few trends from the last 50 years that will most likely continue to be studied. Self-efficacy and self-regulation have been major themes throughout the last 50 years, and they were well represented in 2020. Cognition, motivation, and student learning were other trends that have been closely examined during the last 50 years and continued to be well represented as the field moves into the 2020s.

Synthesis of 50 Years: Common Themes Throughout the Decades

Since the 1970s, motivation, self-efficacy, and self-regulation continue to be common areas of interest in the field of educational psychology. The literature also frequently touches on schemas and cognitive load. Significant numbers of new measurement tools and standards were also developed and advanced. Repeatedly, educational psychology studies outlined the factors affecting learning and counseling, observed and organized insightful findings, and suggested how this cognizance could lead to improvements for students, teachers, counselors, and clients alike. Because of this, articles and studies throughout the past five decades were centered around determining the effects of external and internal factors on both learning and counseling outcomes. The subject consistently comprised teachers, students, counselors, or clients. With all of this in mind, we delve into more detail regarding common themes.

Teachers

In the 1970s, researchers began to study teachers and the effect that they had on the learning process. A major article described the impact of teachers on the classroom experience. Brophy (1979) discussed how the behaviors of teachers are very influential on their students. In the 1990s, there was a continuation of this research on the relationship between the effect of the teacher in two studies. The first (Birch & Ladd, 1997) explored the relationship of the teacher and student for children who were just entering school based on three scales: closeness, dependency, and conflict. Through these three characteristics, it was determined how well the students were adjusting to school. The other (Wentzel, 1998), explored which relationships (student–peer, student–parent, or student–teacher) affected different types of motivation (e.g., social, academic).

In the 1980s, Gibson and Dembo (1984) studied the behavior of teachers in relation to their self-efficacy. The 2010s saw a focus on instructional strategies teachers could use to promote student engagement (Chi & Wylie, 2014). Van de Pol et al. (2010) discussed how scaffolding could be a very effective tool for teachers to use, though scaffolding will need

to be more clearly defined in the future. Klassen and Chiu (2010) studied how teacher self-efficacy, job satisfaction, teacher gender, years of experience, and job stress were related. This was followed up by Kim and Burić (2020) who studied the directionality of the relationship between teacher self-efficacy and teacher burnout.

Self-Concept, Self-Efficacy, and Self-Regulation

The topics of self-concept, self-efficacy, and self-regulation were present throughout multiple decades. Beginning in the 1980s, one author in particular, Marsh, published numerous articles setting the framework for the idea of self-concept. In his popular 1985 study with Shavelson, Marsh worked to break down the different areas of self-concept. This allowed him to later build on this research with other authors, such as Parker (1987), and investigate conjecture such as the big-fish-little-pond effect, as well as the hypothesized ways in which self-concept might form and impact an individual.

In many ways, the idea of self-concept transitioned into the idea of self-efficacy. Self-efficacy appeared in the 1980s, when Betz and Hackett (1981) applied Bandura's self-efficacy theory to the career decision-making process. It was also used when Salomon (1984) employed it as a basis for determining the combined effects of self-efficacy and amount of invested mental effort on subsequent achievement. Self-efficacy was also used as a measure in Zimmerman's (1989) study on self-regulation in K–12 students. In the '90s, Bandura (1993) formally defined self-efficacy, and this played a role in multiple articles with various authors throughout the '90s. In the 2000s, the concept of self-efficacy was referenced in multiple popular articles. Teachers' self-efficacy in relation to their effectiveness in the classroom became more apparent in the 2010s and 2020.

Self-regulation was commonly tied to both self-concept and self-efficacy. In the late '80s Zimmerman (1989) utilized variables such as self-efficacy to further understand self-regulation in K–12 students. And, in the '90s, Pintrich and de Groot (1990) considered the fundamental makeup of self-regulation. Skipping ahead to 2020, a number of popular articles exist regarding self-regulation, and self-regulation began to intertwine with other popular topics, such as cognitive load. For example, Nückles et al.'s (2020) article on student journal writing and the effect on self-regulation and cognitive load. Additionally, we saw self-regulation evolving into the concept of self-determination. Or, according to Wehmeyer et al. (2017), an evolution from self-regulation's "focus on goal-directed actions" (p. 232) to self-determination's focus on "perceived internal vs. external loci of causality" (p. 232). For example, Vasconcellows et al.'s (2020) article centers on self-determination, rather than self-regulation, in relation to physical education.

Motivation

The topic of motivation may have been the most discussed theme throughout the 50 years covered in this chapter. What motivates students and how to get students more motivated to learn seem to be the predominant questions asked throughout these decades. In the '70s, the questions were general, focusing on how effort plays into motivation and how students think about their previous successes or failures. In the '80s, the focus shifted to goals and what types of goals lead to the best learning outcomes. Mastery-oriented goals stood out from the research as the best type of goals to encourage in the classroom. The '90s started to evaluate how students approach motivation and how it is created within a classroom. The 2000s expanded upon this, delving into the details of intrinsic versus extrinsic motivation and parsing out the different types of extrinsic motivation. Eventually, the discussions on motivation have become much more specific, analyzing the way motivation works within specific contexts.

Cognitive Load

The theme of cognitive load spanned multiple decades. Beginning in the '80s, Meece et al. (1988) began to think about cognitive processing via their study analyzing students' cognitive engagement. In the '90s, Sweller et al.'s (1998) theoretical article explaining various aspects of the working memory opened up the concept for future decades. In the 2000s, popular studies focused on methods of measuring and reducing cognitive load. Multiple authors contributed to this theme by way of various articles during the 2000s. The 2010s also saw authors building on existing cognitive load theory. Sweller (2010) split the concept into both intrinsic and extraneous cognitive load. Additionally, at the close of the decade, Sweller summarized existing research regarding cognitive load. Finally, in the 2020s, a handful of popularly cited articles regarding cognitive load emerged. Nückles et al. (2020) studied the correlation between student

journaling, self-regulation, and cognitive load. De Bruin et al. (2020) constructed a framework consisting of elements of both self-regulation and cognitive load theories. De Bruin et al. (2020) also explained student-driven efforts to self-regulate cognitive load.

Measurement Tools and Statistical Processes

Advanced measurement tools and statistical processes were introduced and discussed in several of the top cited articles over the last 50 years. This started in the 1970s with the introduction of the Mathematics Anxiety Scale (Betz, 1978). Three other highly cited measurement tools that developed over the last 50 years included the binomial effect size display (BESD; Rosenthal & Rubin, 1982), the Working Alliance Inventory (WAI; Horvath & Greenberg, 1989), and the Metacognitive Awareness Inventory (MAI; Schraw & Dennison, 1994). Despite this progress, there are still areas of educational psychology and counseling research where the development of measurement tools is needed. For instance, in their meta-analysis Van de Pol et al. (2010) recommended a measurement tool for scaffolding be developed.

In addition to new measurement tools, advanced statistical processes have been discussed in the literature. Factor analysis technique (Tinsley & Tinsley, 1987) and multilevel modeling (Peugh, 2010) are two statistical techniques that educational psychology and counseling researchers have discussed in the literature and encouraged others to use. Additional attempts to advance the statistical rigor of research came from Schlomer et al. (2010) and Baraldi and Enders (2010) when they discussed best statistical practices regarding missing data.

Most Important Issues, Topics, and Trends by Decade

Throughout the period, writings on educational psychology and counseling led to the emergence of topics and trends that seemed to define each decade. Additionally, once an idea was established in any given decade, the material and literature could then go on to serve as a building block or reference point for future decades. Problems and concerns that spanned multiple decades, such as cognitive load and how to motivate, became somewhat of a backbone for the overall literature of this field.

In the '70s, schema theory was a novel idea introduced to the discipline. Schema theory focused on the learning of new materials and how those new materials become incorporated into existing understanding. Wittrock (1974) proposed that previous preconstructed knowledge of a subject contributes to newly generated understanding in learners. Pichert and Anderson (1977) showed that the preexisting perspective of a learner influenced the ideas that they subsequently recollected. Additionally, Pichert and Anderson (1977) also found that the perspective of an individual student contributed to setting the level of importance.

The '80s brought about important insights into self-efficacy and self-regulation, beginning with Betz and Hackett's (1981) investigation into Bandura's self-efficacy theory and the authors' efforts to apply the theory to the process of deciding on a career. In 1984, Salomon analyzed the achievement levels associated with television versus print media using the idea of self-efficacy. Zimmerman's (1989) study five years later involved determining the effects of self-efficacy, among other factors, in students' self-regulation. In the same year, Grolnick (1989) discussed the role of parents in a student's self-regulation capabilities.

The '90s placed a spotlight on cognitive load that would carry on in future decades. Sweller et al. (1998), in the most highly cited article of the decade, explained working memory and built on the idea of using schemas to decrease the necessary amount of cognitive load for learning purposes. Paas (1992) paired the ideas of cognitive load and schemas to observe the problem-solving abilities of students at various levels of a problem's completion (i.e., not at all complete, partially worked, or completed).

In the 2000s, the common theme of motivation exploded in popularity. As the most cited article of the decade, "Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions" aimed to more deeply explore the two types of motivation (Ryan & Deci, 2000). Also high on the list was Wigfield's (2000) study on the intrinsic and extrinsic decision-making process in relation to a student's expected rewards. Hidi and Renninger (2006) analyzed the development of

interest in a topic and how it then transforms into a motivating factor for continuing interest. A handful of other articles in the 2000s rounded out the decade's impact on the area of motivation.

In the 2010s, articles regarding student learning outcomes dominated the list of top cited articles. Authors in this decade researched whether the factors affecting learning outcomes were contextual or external to the student. The majority focused on student learning outcomes in relation to external variables. Some factors considered were teacher support and structure (Jang et al., 2010), instructional methods (Alfieri, 2011), engagement strategies (Pekrun, 2011), classroom emotional climate (Reyes et al., 2012), school climate (Wang & Degol, 2016), and teacher competence (Kunter et al., 2013). Student-specific areas studied were student engagement (Chi & Wylie, 2014), student executive function (Best et al., 2010), and student mindset (Yeager & Dweck, 2012).

As outlined in this synthesis, multiple common themes and trends emerged over the past 50 years in the field of educational psychology and counseling. The general literature has evolved the concept of students, teachers, counselors, and clients in relation to a variety of factors and has focused on improving the outcome as defined by multiple variables. We are interested to observe how the effects of the unprecedented 2020 pandemic work to shift the literature in decades to come.

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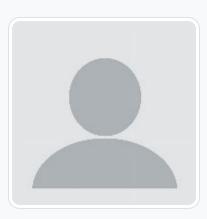
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