In the last 20 years, research on teachers’ beliefs, their relationships to students’ motivation and learning, and the difficulty of changing those beliefs has increased dramatically. In this chapter, key theoretical perspectives that have been useful in guiding this research will be briefly reviewed in a historical overview with discussion of important contributions to advancing research on teachers’ beliefs. These perspectives include the study of teachers’ beliefs from various orientations, including personality, philosophical analysis, constructivist and sociocultural theories, beliefs as emotional and motivational constructs, teaching as persuasion, modifying teachers’ beliefs as a process of conceptual change, and developing and supporting beliefs from an ecological perspective.

Interest in the study of teachers’ beliefs has evolved gradually over the last 60 years. In this chapter, its evolution will be illustrated through an exploration of the changing perspectives on the study of teachers’ beliefs as described in major references: the four editions of the *Handbook of Research on Teaching* (Gage, 1963; Travers, 1973; Wittrock, 1986; Richardson, 2001), the three *Handbooks of Educational Psychology* (Berliner & Calfee, 1996; Alexander & Winne, 2006; Harris, Graham, & Urdan, 2012), and seminal journal reviews (i.e., Kagan, 1992; Pajares, 1992; see Table 3.1). Conclusions focus on an assessment of the extent of progress in the study of teachers’ beliefs. Recommendations for better theoretical integration and research directions are discussed.

**BELIEFS AS A CENTRAL COMPONENT OF PERSONALITY**

Prior to the publication of the first *Handbook of Research on Teaching* (Gage, 1963), only a few studies of teachers’ beliefs were conducted, and most were dissertation studies. The dominance of behavioristic theory during the 1940s and 1950s discouraged research on cognitive constructs, such as beliefs, which is reflected in the
lack of references to teachers’ beliefs in the subject indexes of the first three volumes of the Handbook of Research on Teaching. In the first Handbook (Gage, 1963), the topic of teachers’ beliefs was not included in the table of contents or the index. However, Getzels and Jackson’s (1963) chapter on “The Teacher’s Personality and Characteristics” offers interesting insights with relevance for research on teachers’ beliefs. The authors reviewed in detail the development of the Minnesota Teacher Attitude Inventory (MTAI; Cook, Leeds, & Callis, 1951) and efforts to assess its reliability and validity. Without addressing the issue of the distinction between attitudes and beliefs that has a rich history in social psychology that needs to be incorporated into the study of teachers’ beliefs (see Banaji & Heiphetz, 2010), the history of the MTAI is informative, as it clearly was based on the assessment of teachers’ beliefs. Consider sample items used with a Likert response scale: e.g., “Children should be seen and not heard”; “boastful child[ren] are usually over-confident of [their] ability.” (p. 508). The description of the MTAI in the 1951 Manual (as cited by Getzels & Jackson) touts its “high reliability” and value in predicting teachers’ ability “to get
Historical Overview

Along with pupils” and indirectly the teachers’ satisfaction with teaching as a career (p. 508). The hope of many educators and policymakers at the time was that the MTAI could be used to select candidates for teacher education and for teaching positions. The development of the inventory was impressive in some ways. As Getzels and Jackson described the process, the developers began with 350 items, stated in the negative and positive format for a total of 700 items. In a validation study of a randomly selected sample of 100 teachers of grades 4 through 6, the teachers’ scores on the 164 items selected for use in the final inventory and three independent measures of teacher-student rapport were used: principal ratings, researcher ratings of observations of the teachers in their classrooms, and student ratings of their teachers on a 50-item questionnaire. Other strategies used in the research were problematic. Selection of discriminating items was determined empirically by asking principals to identify teachers they considered “superior” and “inferior” in maintaining “harmonious relations” in their classrooms. Despite the many items on the inventory on a range of varying topics, the researchers used only a total score in the analysis. A couple of factor analyses were reported supporting only a one-factor solution, but analytical procedures were of questionable validity.

Over 60 studies were conducted with the MTAI, but the results failed to meet the high expectations of its advocates. Inconsistencies of results in numerous studies raised questions about the validity of scores on the inventory. Some research results suggested the possibility that scores on the measure could be faked. Della Piana and Gage’s (1955) study of 97 teachers in grades 4 through 6 and their 2,700 students has particular relevance for future research on teachers’ beliefs. Their results suggested the possibility of an interactive effect of teachers’ MTAI scores and students’ values (preference for teachers with a cognitive focus vs. those with an affective focus) on students’ reported liking of their teachers. Although the researchers’ analyses of their data are questionable from the perspective of current standards of design and analysis, this study suggests the current need to investigate the interactive effect of teachers’ beliefs and students’ beliefs, needs, and preferences on students’ motivation and achievement.

In concluding their chapter, Getzels and Jackson (1963) lamented the lack of progress made in understanding the relationship between teachers’ personality and their teaching effectiveness. They attributed the problem to three major obstacles that have a disturbing similarity to current problems in research on teachers’ beliefs: lack of an adequate definition of personality, the inadequacy of measures, and the lack of adequate measures of teacher effectiveness, which were primarily ratings that were inconsistent across raters. To these three problems, Getzels and Jackson added the tendency that still occurs too often in contemporary research: failing to control for teachers’ gender, age, grade level, and subject matter, and variations in school-, community-, and class-level variables, including the students’ achievement levels and SES. Getzels and Jackson attributed these problems largely to the lack of a theoretical basis for the research. They elaborated on this problem based on issues raised by the American Educational Research Association Committee on the Criteria of Teacher Effectiveness (1952, 1953). Getzels and Jackson’s discussion of the importance of grounding research on a firm theoretical basis merits review today, as many reports of research still lack adequate theoretical support. As for the future of the MTAI, use of the instrument virtually disappeared shortly after publication of the Getzels and
Jackson chapter. For an update on the problems associated with the use of measures of beliefs and attitudes in selecting teachers, see Metzger and Wu (2008), cited by Fives and Buehl (2012). Research on attitudes continued in the interval between the first and second handbooks, but rather than focus on the assessment of teachers’ attitudes, the emphasis was on the teaching of positive attitudes to students.

**A DREAM DEFERRED?**

The second *Handbook of Research on Teaching* (Travers, 1973) reflects the editor and authors’ disappointment in the lack of progress made in educational research in the 10 years following the publication of the first *Handbook* relative to the amount of US federal funding received. The editor wrote, “The heavy emphasis in this volume on what is wrong with educational research . . . reflects the general level of inadequacy of much of the research” (p. vii). In this volume, the topic of teachers’ beliefs appeared on only one page, according to the index. Price (1973) mentioned the need to conduct empirical studies of how teachers’ belief in a theory of knowledge might affect their beliefs about education, an early insight into the importance of the study of epistemological beliefs.

Notably, Peck and Tucker (1973) in their chapter on teacher education in the *Second Handbook* were optimistic about the research on teacher education emerging as the result of the influx of federal funds for the study of teacher education. They explained that the complexity of the process of teacher education could not be adequately studied by independently conducted studies by single individuals, and the emergence of research centers that created collaborations within and across teacher education schools, colleges, and universities held the promise of significant progress. Their review focused on the encouraging results of experimental studies designed to increase teachers’ skills in instruction and motivation as well as socioemotional relationships with students. Although the topic of beliefs was never mentioned in the chapter, the increases in preservice teachers’ skills and self-regulation reported in these studies were undoubtedly mediated by changes in their beliefs. In their conclusion to the chapter, however, Peck and Tucker did not sustain their earlier optimism. They cautioned that the growth of federal funding that seemed so promising from 1963 to 1968 had slowed “almost to a halt” (p. 971), and their hopes for a future in which systematic collaborative research would guide the development of a more theoretically and empirically grounded performance-based approach to teacher education would likely be deferred.

**RUMBLINGS OF PARADIGM SHIFTS**

In the 13 years between the publication of the second and third handbooks, as findings from experimental studies of teaching practices increased, some educational theorists began to question the appropriateness of the trend toward training teachers to apply research-based teaching practices, and recognition of the importance of teachers’ beliefs in determining their practice began to emerge. Floden (1985) described three perspectives that challenged the role of researchers and teacher educators as experts who provide research-based conclusions for adoption by educational practitioners (e.g., Buchmann, 1984; Fenstermacher, 1979; Zumwalt, 1982).
The advocates of these perspectives proposed that researchers and teacher educators should engage teachers in discussions about teaching and leave the drawing of conclusions for practice to teachers. Fenstermacher, in particular, emphasized the importance of teachers’ beliefs as a major determinant of their practice that had the potential to enable them to meet the moral responsibilities of their work. Floden objected to the advocates’ notion that using persuasion (i.e., rhetoric) in the education of teachers must be abandoned. Instead Floden argued that the problem is the type of persuasion used rather than persuasion per se. He acknowledged the validity of the advocates’ position that the rationality of teachers must be respected and engaged but maintained that persuasion is appropriate if it is based on sound reasons and allows teachers the opportunity to openly question their instructors and receive reasonable explanations of the grounds for researchers’ conclusions. This controversy lingers in the current literature on teachers’ beliefs (see, for example, Alvermann, 2001).

**PARADIGM PROLIFERATION (TEACHER THINKING, INTERPRETIVE AND SOCIOCULTURAL ANALYSIS)**

The difference in the attitudes regarding the quantity and quality of the research available for review of the editor Wittrock (1986) and chapter authors of the third *Handbook of Research on Teaching* compared to the attitudes of the editor and authors of the second *Handbook* (Travers, 1973) is dramatic. Unlike the previous editor’s disappointment with the quality of research and the authors’ difficulty in finding important research grounded in coherent and integrative models and theories of teaching, Wittrock heralded the flourishing of research on teaching and reported that all the chapter authors described significant advances in research. Several chapters revealed new programs of research in interpretive analysis of classroom ecologies and cognitive science that were laying the foundation for the emergence of research on teachers’ beliefs.

In the introductory chapter of the third *Handbook*, Shulman (1986) described the process-product approach to studying teaching (that is, the behavior-oriented research paradigm that was dominating educational research), and highlighted the emergence of several new research programs that were challenging that dominance. Among these challengers, Shulman noted fledgling efforts to introduce more cognitive variables into the study of teaching, and he referred to this new paradigm as *teacher cognition and decision making*. As a representative of this paradigm, Clark and Peterson’s (1986) chapter on teachers’ thought processes included a section on “Teachers’ Theories and Beliefs.” In the 11 pages of that section Clark and Peterson provided a review of the research on teachers’ attributions for students’ performance and called for research on the relationship between teachers’ attributions and their planning and interactive decision making and student achievement. They also discussed research on teachers’ conceptions of teaching, learning, and reading, their role as teachers, their beliefs about teaching in open education settings, and principles of practice. Erickson’s (1986) chapter on the qualitative, interpretive perspective promoted the widespread adoption of research methods that have contributed to our study of and understanding of teachers’ and students’ beliefs.
Fenstermacher’s (1986) chapter on the appropriate use of research findings from a philosophical perspective merits reconsideration for its potential to improve teachers’ use of research in their practice. Concerned about the lack of attention to the “profoundly moral task” of education (p. 37), Fenstermacher used a multidisciplinary analysis: (a) philosophical concept analysis to clarify the meaning of teaching, (b) philosophy of science to differentiate between the roles of knowledge production and knowledge use, and (c) moral theory to explain that the appropriate use of research is to alter “the truth or falsity of beliefs that teachers have, as it changes the nature of these beliefs, and as it adds new beliefs” (p. 43). Fenstermacher viewed these beliefs as the basis for “practical arguments, or some similar way of acknowledging purposive, passionate, intuitive, and moral properties of human action . . . the methods for transforming what is empirically known and understood into practice” (p. 44). In sum, Fenstermacher described an educationally sound approach for researchers and teacher educators to use educational science to help preservice and inservice teachers develop rationally defensible beliefs that would enable them to fulfill the moral responsibilities of teaching.

CLARIFYING THE CONSTRUCT OF TEACHERS’ BELIEFS

Following the publication of the third Handbook of Research on Teaching, several seminal papers appeared that provided the impetus for greater interest in the potential of research on teachers’ beliefs to inform educational practice. Concern about the distinction between beliefs and knowledge was increasing. Nespor (1987) applied Abelson’s (1979) psychological analysis of the distinction between knowledge systems and belief systems to develop a preliminary model of belief systems as a framework for future research that was theoretically grounded in cognitive science, and he offered some empirical support for the model from his field-based study of the beliefs of eight eighth-grade teachers over a semester using videos and interviews. The seven features Abelson described as the “hot cognition” that distinguishes knowledge systems from belief systems bear repeating:

1. The elements (concepts, propositions, rules, etc.) of a belief system are not consensual. [They are idiosyncratic and personally derived from experience.]
2. Belief systems are in part concerned with existence or nonexistence of certain conceptual entities (e.g., God, Extra Sensory Perception).
3. Belief systems often include representations of “alternative worlds,” typically the world as it is and the world as it should be.
4. Belief systems rely heavily on evaluative and affective components.
5. Belief systems are likely to include a substantial amount of episodic material from either personal experience or (for cultural belief systems) from folklore or (for political doctrines) from propaganda.
6. The content set to be included in a belief system is usually highly “open.”
7. Beliefs can be held with varying degrees of certitude.

( pp. 356–360)

In discussing how these seven features might affect “how teachers learn and use what they learn” (p. 324), Nespor (1987) focused on the fourth feature, emphasizing
that the emotions and affect inherent in beliefs shed light on their appeal to teachers and the tenacity with which they may be held in the face of contradictory evidence. Nespor suggested that, for teachers, beliefs may seem better suited to helping them cope with “the ill-structured” and “deeply entangled” problems of teaching than research-based knowledge or academic theory (p. 324). Nespor concluded by noting that we lack sufficient understanding of the nature of beliefs, how they develop, the supports and challenges to them, and how to foster them, a theme that is echoed in Fives and Buehl’s (2012) analysis of current research on teachers’ beliefs.

Almost 20 years after Travers’s (1973) disappointment with the progress in research on teaching and despite having compiled a 925-page volume, Houston, Haberman, and Sikula (1990), editors of the first Handbook of Research on Teacher Education, concluded that “there has been notable recent progress, but the research basis for such important work as educating the nation’s teachers is still extremely thin. Although the importance of research is being espoused, little progress is being made” (p. ix). To address the need for more and better research to foster teachers’ development, Pintrich (1990) in his chapter in that volume focused on the need for researchers to integrate research on motivation—particularly teachers’ beliefs and emotions—into their cognitive models to yield more comprehensive models of teaching and student learning. In synthesizing the psychological literature on the issues of what develops during teacher education and how it develops, Pintrich applied a general social-cognitive perspective. From the cognitive perspective he noted that “teachers are active thinkers, decision makers, reflective practitioners, information processors, problem solvers, and rational human beings” (p. 827) and that, from the social perspective, teachers are embedded in a social context that may advance or inhibit their cognitive processing. To study what develops in teacher education, Pintrich emphasized that in their models of teacher thinking and teaching, researchers must integrate “the hot cognitions of self-beliefs and motivation . . . along with the cold cognitions of knowledge and cognitive skills” (p. 827). Although he avoided a discussion of the distinction between knowledge and beliefs, Pintrich highlighted the expectancy-value model of motivation (Eccles et al., 1983) with his addition of other motivational components as useful for analyzing research (Pintrich, 1990, p. 842). He included two types of beliefs as central to the three motivational components in the model: “(a) beliefs about the importance and value of the task (value components), (b) beliefs about one’s ability or skill to perform the task (expectancy components), and (c) feelings about the self or emotional reactions to the task (affective components)” (p. 842). Pintrich emphasized the power of a dynamic conception of self that includes multiple views of the self (e.g., past, present, and future selves, the achieving self, the nurturing self, the anxious self) and suggested that this dynamic conception of the self “proposes a mechanism by which the active self mediates and provides continuity between the personal characteristics of the individual and the environmental demands of the situation” (p. 837).

In closing, Pintrich (1990) concluded that “a good foundation for research and model building in learning and development” comprises four general domains—(a) teacher knowledge, (b) thinking and problem solving, (c) metacognition and self-regulation, and (d) motivation, and he recommended that “a general constructivist paradigm could be the most fruitful approach to pursue for research” (p. 850).
To change teachers’ beliefs, Pintrich was one of the first analysts to recommend the application of the conceptual change literature (Posner, Strike, Hewson, & Gertzog, 1982). Pintrich pointed out that teachers’ epistemological beliefs about the nature of teaching and learning might be a particularly appropriate target for belief change and emphasized the importance of assessing teachers’ beliefs prior to teaching to identify beliefs that might interfere with learning.

In 1992 two important reviews of research on teachers’ beliefs were published. First, Kagan (1992) offered a valuable analysis of the rapidly growing research literature on the topic and issues that remain relevant for researchers. Distinguishing between knowledge and belief in particular remained a conundrum for researchers. Kagan asserted that “most of a teacher’s professional knowledge can be regarded more accurately as belief. . . . [whereas] knowledge is generally regarded as belief that has been affirmed as true on the basis of objective proof or consensus of opinion. These are the gauges we use to distinguish facts (knowledge) from mere opinion (belief) in a particular domain” (p. 73).

To illustrate that the research on teachers’ beliefs was “a riotous array of empirical research” (p. 66), Kagan (1992) created a 5-page summary table of 25 studies of teachers’ beliefs, each one focusing on a different correlate of one of two topics: teachers’ sense of efficacy or content-specific beliefs. From her analysis, Kagan described the consistent findings in such studies as showing that teachers’ beliefs were, for the most part, stable and resistant to change, and because the beliefs were mostly tacit, they could not be measured reliably through interviews, questionnaires, or inferred from behavior; yet with more subtle indirect methods such as constructing concept maps of their pedagogical understandings and engaging in think alouds (in which teachers analyzed their own or others’ videotaped performances), teachers revealed that their beliefs were primarily influenced by three contexts: the students, the content, and their experientially derived personal beliefs. Twenty years later, Fives and Buehl (2012) in their chapter in the Handbook of Educational Psychology echoed similar conclusions about teachers’ beliefs.

In addition to describing the typical characteristics of teachers’ beliefs, Kagan (1992) discussed the consistent evidence showing that reading and applying research to their practice had failed to change beliefs of preservice and inservice teachers. This lack of belief change emphasized the need to investigate the processes implicated in changing teachers’ beliefs. Kagan, like Pintrich (1990), turned to the literature on conceptual change as a basis for research on changing teachers’ beliefs. In particular, she cited Clement, Brown, and Zietman (1989), who emphasized not only the need to identify the “brittle” beliefs that impede conceptual change but also the “anchor” beliefs that foster conceptual change, a potentially useful approach that has received little attention in research on conceptual change.

In the second article published in 1992, Pajares added to Kagan’s (1992) insights on the implications of research on teaching and offered his own seminal insights making his article essential reading for teacher educators and researchers studying teachers’ beliefs. Pajares focused on clarifying the confusion that has hampered the progress of research on teachers’ beliefs in the hope that belief could rise to its rightful place as “the single most important construct in educational research” (p. 329). His commitment to improving the quality of research on teachers’ beliefs was motivated by his belief that “beliefs are the best indicators of the decisions individuals make
throughout their lives” (p. 307), as advocated by numerous philosophers throughout
history and contemporary psychologists (e.g., Bandura, 1986; Nisbett & Ross, 1980).

Pajares (1992) attributed the confusion evident in the proliferation of psychol-
ogical constructs (e.g., attitudes, perceptions, perspectives, personal theories), all
“aliases” for beliefs, to the lack of a clear distinction between knowledge and beliefs (p. 327). In seeking a clear distinction, Pajares turned to notable theorists (i.e., Nespor,
1987; Nisbett & Ross, 1980; Rokeach, 1968) who argued that belief involves stronger
affect and evaluation than does knowledge. However, Pajares suggested that these
theorists underestimated the importance of evaluation and affect in knowledge, and
he concluded that belief and knowledge are “inextricably intertwined” (p. 325). On
the basis of Rokeach’s definition, Pajares proposed a view of beliefs that although
not resolving the issue of knowledge and belief offers researchers a basis for a more
adequate assessment of teachers’ beliefs than has yet been achieved; that is, belief is
“an individual’s judgment of the truth or falsity of a proposition . . . that can only
be inferred from a collective understanding of what human beings say, intend, and
do” (p. 316). Referring to Rokeach (1968), Pajares (1992) reminded researchers that
“beliefs cannot be directly observed or measured but must be inferred from what
people say, intend, and do,” adding the admonition: “fundamental prerequisites that
educational researchers have seldom followed” (p. 314). In other words, researchers
cannot be content with questionnaire assessments of teachers’ self-reports of their
beliefs. They must seek carefully conceptualized, integrated, and validated under-
standings, by focusing on teachers’ context-specific beliefs and their interconnections
to other beliefs and behavior. They should use open-ended interviews, observations,
and related think-alouds to determine consistencies and inconsistencies between
what teachers say, intend, and what they do; reactions to dilemmas that challenge
core beliefs; creations of concept maps that identify the connections between educa-
tional and personal beliefs; and most important, explorations of the beliefs that lead
to motivations and behaviors that affect students’ learning and well-being. Pajares
reminded us that “little will be accomplished,” if researchers ignore the need to con-
nect teachers’ beliefs with teachers’ knowledge and practices and student outcomes
(p. 327). How, for example, Pajares asked, can teacher educators “make educational
beliefs a primary focus of their teacher preparation programs . . . without research
findings that identify beliefs that are consistent with effective teaching practices and
student cognitive and affective growth, beliefs that are inconsistent with such aims,
and beliefs that may play no significant role” (pp. 327–328).

The goal Pajares (1992) set for educational researchers and teacher educators is
no small challenge. He ended his review with 16 characteristics of beliefs, each one
as daunting as the next, reinforcing the need to recognize the complexity, intransi-
gence, and power of human belief systems to promote development or to hinder it.
Our efforts to understand and change them when warranted must be as robust as
they are. Of special note, Pajares cautioned researchers about the dangers of a con-
struct as “messy” as teachers’ beliefs in an area as ill-defined as teaching and referred
to Nisbett and Ross’s (1980) description of the limitations in human inference that
lead to perseveration and rigidity in teachers’ beliefs and to Nespor’s (1987) notion
of an entangled domain as examples that leave teachers unable to use cognitive strat-
egies effectively and uncertain about what to do. Pajares elaborated on Abelson’s
(1979) and Nespor’s insights on the role of emotion in sustaining teachers’ beliefs.
and accounting for their resistance to efforts to change those beliefs. Like Kagan (1992) and Pintrich (1990), Pajares saw hope in the research on conceptual change as a basis for promoting warranted change in beliefs (Posner et al., 1982), and more recent research (e.g., Gill, Ashton, & Algina, 2004) continues to support that effort.

COMING OF AGE OR NOT? THE TENTATIVE LEGITIMACY OF RESEARCH ON TEACHERS’ BELIEFS

Growing enthusiasm for the cognitive and social perspectives reviewed in Wittrock’s (1986) Handbook of Research on Teaching is evident in the first Handbook of Educational Psychology (Berliner & Calfee, 1996), the first Handbook to include a chapter on beliefs. Calderhead’s (1996) chapter entitled “Teachers: Beliefs and Knowledge” offered researchers hope for progress in studying teachers’ beliefs. However, despite giving the lead in his chapter title to beliefs, Calderhead devoted less than three pages to research on teachers’ beliefs. He reviewed Nespor’s (1987) distinctions between knowledge and beliefs, Pajares’ (1992) discussion of the functions of teachers’ beliefs, and a few studies of teachers’ beliefs about teaching, subject matter, learning to teach, self and the teaching role, and the relationship of beliefs to classroom practice, showing the expanding nature of topics of interest to researchers. This last section is most relevant to current concerns because Calderhead focused on the inconsistency between two studies of teacher change: Guskey’s (1986) report of a staff development study that Guskey interpreted as showing that changes in behavior precede changes in beliefs, if the behaviors are successful, and Richardson’s (1994) report of a staff development approach to changing reading instruction that she interpreted as showing that changes in practices occur with interactions of behavior and belief and that either can initiate changes in practice. Clearly more research on this issue is needed.

The handbook chapter by Snow, Corno, and Jackson (1996) on individual differences in affect and motivation offered important though contradictory theoretical perspectives on teachers’ beliefs, reflecting the confusion about the nature of beliefs and the mounting support for acknowledging and studying the role of motivation and emotion inherent in beliefs. Basing their analysis of individual differences on the age-old conception of mental states as consisting of affection, conation, and cognition, the authors included a figure entitled “A Provisional Taxonomy of Individual Difference Constructs” (p. 247). The figure was divided into three separate parts, with affection and cognition on separate ends of the figure and conation in the middle. The construct of beliefs was aligned on the far right of the figure under cognition, specifically under declarative knowledge. In contrast, emotion and attitudes were shown on the far left of the figure under affection; however, the authors’ discussion of attitudes and beliefs in the text conflicted with their representation in the figure. In describing the social psychological conception of attitudes, the authors mentioned that “attitudes are usually studied as aggregates of beliefs” (p. 290). Moreover, in the discussion of beliefs, Snow et al. explained that most of the studies of belief in education were cognitive analyses that ignored the affective and conative aspects of beliefs. They cautioned readers that such theories ignore “the emotional or motivational role [of beliefs]. . . . [Beliefs] are not strictly cognitive. . . . The frequent finding that some ‘cognitive’ misconceptions are deep-seated and resistant to instruction
suggests that they may also have affective roots” (p. 291). In addition, they called for research integrating affective, conative, and cognitive functioning, noting that without including affect and motivation in cognitive models the “dynamic, energizing” aspects of human functioning are lost (p. 295). Thus, although in their preliminary taxonomy, the authors represented beliefs as separate from emotions and motivation, their discussion of the affective and conative aspects of beliefs portended the ultimate abandoning of the cognitive conception of beliefs in social psychology, as evidence of the affective nature of beliefs has mounted (Banaji & Heiphetz, 2010), an insight that warrants further consideration in educational research (for a more elaborate discussion on this topic, see Gill & Hardin, Chapter 13).

**ENCOURAGING RESEARCH ON TEACHER CHANGE**

As further evidence of the slow pace of progress in studying teachers’ beliefs, in the fourth *Handbook of Research on Teaching* (Richardson, 2001), Munby, Russell, and Martin’s (2001) chapter “Teachers’ Knowledge and How It Develops,” similar to the few pages in Calderhead’s (1996) chapter on beliefs and knowledge, included only one page on teachers’ attitudes and beliefs. Rather than provide descriptions and analysis of research on teachers’ beliefs, the authors presented a brief summary of Calderhead’s discussion of beliefs in his chapter and a summary that failed to do justice to Richardson’s (1996) excellent review of research on teachers’ attitudes and beliefs.

In their chapter on teacher change, Richardson and Placier (2001) did not address teachers’ beliefs directly, but their chapter provided encouraging evidence that challenged the notion of rigid stability of inservice teachers’ beliefs. Although the studies cited continued to support the difficulty of changing preservice teachers’ beliefs, Richardson and Placier concluded that for inservice teachers, “long-term, collaborative, and inquiry-oriented programs appear quite successful in changing beliefs, conceptions, and practices” (p. 921).

**INCREASING COMPLEXITY AND THE DESIRE TO RETURN TO SIMPLICITY**

The increasing influence of research on teachers’ beliefs is particularly evident in the second *Handbook of Educational Psychology* (Alexander & Winne, 2006), as two chapters are devoted to it. The growing complexity of researchers’ views on teachers’ beliefs is reflected in the decision of Woolfolk Hoy, Davis, and Pape (2006) to organize their review of research on teachers’ beliefs from 1995 to 2006 using Bronfenbrenner’s (1986) ecological model. This decision reflects the many diverse influences and contexts that impinge on the development and enactment of teachers’ beliefs, from the teachers’ own personal characteristics and experiences to the diverse needs and characteristics of the children they teach and their parents’ expectations for both their children and their children’s teachers, the demands of the school, the district, community, state and national context, and the diverse norms and values in the culture. In summarizing their conclusions, Woolfolk et al. expressed concern about the trend that has resulted in “ever more discrete constructs” (2006, p. 730), and they called for a change of direction from such isolated studies of beliefs and knowledge
toward “designs and methodologies that enable us to address the “whole” of teachers’ mental lives” (p. 73). This recommendation encourages the development of research designs that are more theoretically grounded, evidence-based studies that examine the relationship between changes in teachers’ beliefs and their impact on student outcomes, taking into account the multiple influences from the different contexts of Bronfenbrenner’s model.

In their chapter, “Changing Knowledge and Beliefs,” Murphy and Mason (2006) wrestled with two of the most intransigent issues on the topic: (a) distinguishing between knowledge and beliefs and (b) changing teachers’ beliefs. After reviewing previous efforts to distinguish knowledge and beliefs, Murphy and Mason concluded that the two constructs are overlapping and the essential distinction between them is the need to externally validate knowledge.

In their analysis of the process of changing teachers’ beliefs, Murphy and Mason (2006) reviewed research on the two models that have guided most of the research on the topic. Though both approaches are grounded in Piagetian constructivist developmental theory, they have diverged into two relatively distinct approaches driven primarily by their subject matter: on the one hand, science education and, on the other, students’ cognitive development. In addition, Murphy and Mason discussed two more recent models—Dole and Sinatra’s (1998) cognitive reconstruction of knowledge model and Gregoire’s (2003) cognitive-affective model of conceptual change. These two models were proposed to take into account the role of motivation and affect in belief change, as recommended by Nespor (1987), Pajares (1992), Pintrich (1990), and Snow et al. (1996). Both models include a cognitive mechanism for conceptual change (i.e., systematic processing) based primarily on social psychological models of attitude change. In addition to the motivational contributors to belief change incorporated in Dole and Sinatra’s “warm” model of belief change, Gregoire proposed a more comprehensive “hot” model that includes the role of the person’s identity, self-efficacy beliefs, goals, emotions, and prior beliefs in the appraisal process leading to the decision of belief change and the potential for a less intentional approach to belief change through heuristic processing if the appraisal process led to a fear response (i.e., threat) rather than an approach response (i.e., challenge).

In concluding their chapter, Murphy and Mason proposed the need for a theory to unify the disparate approaches to belief change. To offer direction to achieving that goal, they offered a brief description of a theoretical framework based on Peirce’s (1958) conception of beliefs as “conscious, deliberate, habits of action” (p. 320) that would return researchers to their roots in pragmatism. Although the simplicity of such an approach is appealing, it lacks the complexity needed to capture the messy construct that is so multiply determined by unconscious as well as conscious influences implicated in the increasingly multifaceted models of belief change.

**UNDERSTANDING TEACHERS’ BELIEFS IN THEIR COMPLEX ECOCLOGICAL CONTEXTS**

In their chapter in the most recent *Handbook of Educational Psychology*, Fives and Buehl (2012) referred to the complexity of teachers’ beliefs as one of the more prevalent and relevant themes to emerge in the research literature on teachers’ beliefs. This
complexity is particularly evident in their discussion of internal and external supports and challenges to teachers’ implementation of their beliefs (pp. 482–484). In their discussion, Fives and Buehl identified several crucial factors that may support or inhibit whether teachers act on their beliefs. First and foremost, Fives and Buehl emphasized the role of teachers’ personal beliefs, in particular, beliefs about knowledge, their perceived self-efficacy, and identity. In addition, the authors included factors impinging on the immediate classroom context, such as parents’ and students’ reactions to teachers’ practices. Among the major external supports and challenges, Fives and Buehl considered the dramatic effect of culture on teachers’ beliefs across and within cultures and the role that district, state, and national policies can play in influencing the curriculum and resources.

In their analysis of recent research on teachers’ beliefs, however, Fives and Buehl (2012) ended their review with a reminder that the high expectations for research on teachers’ beliefs are far from fulfilled. They concluded that “the systematic and wide-reaching emphasis on teacher beliefs needed to bring these predictions to fruition has yet to be seen” (p. 490).

Fives and Buehl (2012) recommended that to construct a hierarchy of supports and challenges most needed to enhance teachers’ ability to act on their beliefs, these internal and external influences need to be investigated together to identify the most powerful influences. Bronfenbrenner’s (1998) bioecological framework is a valuable structure for guiding research and practice based on Fives and Buehl’s analysis. The value of Bronfenbrenner’s theoretical framework is that it provides a visual representation of the complexity of the multiple contexts as they simultaneously influence teachers’ ability to enact their beliefs in their classroom. Moreover, it provides a structure for analyzing and identifying multiple sources for supporting teachers’ efforts that can synergistically empower teachers to act on their beliefs if researchers, administrators, and policymakers work to integrate these multiple sources of support rather than focus on single factors whose power is likely to be diminished if not fully supported by other internal and external contextual forces.

CHANGING THE BELIEFS OF RESEARCHERS, TEACHER EDUCATORS, AND EDUCATIONAL POLICYMAKERS

The history of the development of research on teachers’ beliefs reviewed here reveals a sluggish start as researchers have wrestled with how to effectively address such a messy construct that overlaps with knowledge and is confounded with emotion, but enthusiasm has swelled in recent years as more researchers recognize that beliefs are a powerful influence on teachers’ thinking and behavior. However, the history of the research also reveals an important gap that must be addressed if we hope to make progress in fostering teachers’ beliefs that will enhance their performance and well-being as well as their students’. For the most part, researchers, teacher educators, and educational policymakers have held naïve beliefs about the potential of changing teachers’ beliefs with short-term experiences. Social psychology and research on teaching have repeatedly shown that belief change is a complex, arduous, and long-term process. From Lortie’s (1969) description of the enduring effects of 16 years of observations of teachers’ practices on preservice teachers’ beliefs about the nature of effective teaching and the discouraging evidence of the instability of change in
teachers’ beliefs, it is clear that long-term commitments to longitudinal evidence-based research designs that document this long-term developmental process and its effect on students’ motivation and learning are needed.

The success envisioned for research on teachers’ beliefs will not be achieved if the research continues to be mostly correlational studies of relationships among teachers’ beliefs and other constructs and modest investigations of efforts of teacher educators to modify a few teachers’ beliefs. As Fives and Buehl (2012) pointed out, the many qualitative studies of small numbers of teachers conducted in the last 20 years are a rich source of ideas, but they need to be validated in further research. Indeed, the research evidence highlighting the difficulty in changing teachers’ beliefs and inconsistencies across studies raises doubts about the value of research on teachers’ beliefs. Optimistically, the social psychological research continues to offer hope that continuing the effort to study the construct in education can be productive. However, to achieve that goal, much more ambitious, sophisticated, and comprehensive research studies are needed. Consistent with Bronfenbrenner and Morris’s (1998) hope for more ecological research, a preponderance of the research should be experimental, keeping in mind Bronfenbrenner’s (1976) emphasis on Lewin’s dictum, “If you want truly to understand something, try to change it.” However, to enhance the chances that research on teachers’ beliefs will have the impact on improving teaching and the lives of teachers and students envisioned by its advocates, researchers must embed research on teachers’ beliefs in the context of the wider contexts of teaching and teacher education. As Grossman and McDonald (2008) proposed in their advocacy of a more integrative approach to the study of teacher education and teaching, researchers should pool their resources and work on common questions, measures, interventions, and outcomes. They provided examples of initiatives that have fostered such efforts (e.g., the Carnegie Foundation for the Advancement of Teaching). However, the economic climate is threatening progress in educational research with another period of retrenchment reminiscent of the 1960s and 1970s, as once again federal funding disappears. Bolder and more inclusive efforts seem called for. Consider, for example, the Dunedin Multidisciplinary Health and Development Study (e.g., Moffitt, 2011), in which an entire community agreed to participate in a long-term lifespan study of the development of its children. If faculty in colleges and schools of teacher education and school districts work collaboratively to conduct large-scale ecologically based research studies of the multiple contexts affecting teachers’ and students’ beliefs and their ensuing impacts on teaching and learning, they have the potential to produce a trove of longitudinal data that could yield important insights into teachers’ beliefs and the processes by which they impact teaching and students’ beliefs, motivation, and learning. Progress is possible especially if teacher education institutions work together to expand their collaborations into large-scale studies of teacher education and teaching that follow their graduates into their professional careers in school districts.

Words of caution, however, are needed. In their chapter, Fives and Buehl (2012) wisely noted the ethical dilemma inherent in trying to change beliefs in light of the uncertainties about the validity of research findings for implementation across different contexts. Awareness of this ethical dilemma heightens the importance of conducting evidence-based experiments with powerful interventions with measures of teachers’ beliefs that provide reliable and valid scores capable of predicting effects
Historical Overview

on students’ motivation and learning. With interventions in teachers’ beliefs that are theoretically and empirically grounded in the goal to improve their relationships with their students and their students’ motivation and achievement, we can better tackle the ethical dilemmas inherent in belief change.

Pajares (1992), in his effort to clean up the messy construct of teachers’ beliefs, offered key questions to guide the design and analysis of studies of teachers’ beliefs. In reading this volume and working to improve future research on the topic, we need to heed his advice and ask ourselves these questions:

Are [the beliefs] clearly conceptualized?
Are their key assumptions examined?
Are precise meanings consistently understood and adhered to?
Are specific belief constructs properly assessed and investigated? (p. 329; see Schraw & Olafson, Chapter 6, this volume, for more on this issue)

Most important to remember, however, is Fenstermacher’s (1986) concern that teachers need to be involved in the process of assessing the ethical implications of the research findings to enable them to provide a morally responsible education for their students. To address the ethical issues of education, the following question should be added to the list: Is there a strong theoretical- and empirically-validated foundation to the research of teachers’ beliefs that teachers can use to ground their beliefs that will enable them to promote their own and their students’ cognitive, emotional, social, and moral development as ultimate goals?

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Historical Overview


