

Evolution of a Constructivist Conceptualization of Epistemological Reflection

Marcia B. Baxter Magolda

Educational Leadership
Miami University

The epistemological reflection model offers a constructivist theory of personal epistemology based on a 16-year longitudinal study. Participants' developmental journeys are intertwined with the researchers' journey to trace the evolution of the model and its implications for research and practice to promote personal epistemology.

A friend who is a physics major said he was going to a physics seminar. When I heard the word *seminar*, I thought, "Physics has seminars? I mean, you can debate physics? And not be right and not be wrong?" *Reginald* (Baxter Magolda, 1992, p. 136)

Rereading the data, I became immersed in the students' stories. I lost track of the categorization system that had become so ingrained in my thinking as I listened to their experiences and what they thought about them. The experience transformed my thinking. *Marcia* (Baxter Magolda, 1992, p. 10)

These two quotes, one from a participant in my longitudinal study and the other from my own notes as researcher, illustrate moments of epistemological transformation—questioning existing assumptions and crafting new ones to see the world from a more complex perspective. Reginald conveys his new insights on physics that led him to a new perspective on knowledge. I convey my new way of seeing inquiry that led me to a constructivist conceptualization of epistemological reflection (ER). In this article I narrate the interweaving of two transformational journeys—my own and that of longitudinal participants—to explain how the ER model and its paradigmatic foundation evolved over the course of a 20-year research program.

The ER model emerged from a 16-year longitudinal interview study of young adults' development from age 18 to 34 (Baxter Magolda, 1992, 2001). I use the term *epistemological reflection* to refer to assumptions about the nature, limits, and certainty of knowledge, and how those epistemological assumptions evolve during young adult-

hood. Like other developmental theorists (e.g., King & Kitchener, 2004), I view epistemological assumptions about the nature of knowledge—its certainty, complexity, and source—as the core of personal epistemology. I concur with other theorists (e.g., Louca, Elby, Hammer, & Kagey, 2004; Schommer-Aikins, 2004) that beliefs about self, learning, classroom instruction, and domain-specific beliefs are part of personal epistemology. I regard these latter components as intertwined with epistemological assumptions rather than as independent beliefs or resources. Thus, epistemological transformation is a shift to a more complex set of epistemological assumptions rather than the acquisition of particular learning strategies or skills.

The ER model portrays personal epistemology as socially constructed and context-bound. People actively construct or *make meaning* of their experience—they interpret what happens to them, evaluate it using their current perspective, and draw conclusions about what experiences mean to them. The meaning they construct depends on their current assumptions about themselves and the world, conflicting assumptions they encounter, and the context in which the experience occurs. Developmental transformation stems from the interaction of internal (e.g., assumptions) and external (e.g., experiences) factors. Personal epistemology is intertwined with other dimensions of development, namely identity and relationships (Baxter Magolda, 2001).

My conceptualization of the construct of personal epistemology evolved over time. My experiences mirror the socially constructed and context-bound nature of personal epistemology. I actively made meaning of my experiences based partially on assumptions I had at given points in time, conflicting assumptions I encountered, and the context in which these experiences occurred. Evolution of my conceptualization of the construct is due to a complex interplay between

my meaning-making as a researcher, the study participants' meaning-making as young adults, and the implications of the intersection of these two sets of meaning-making for how I conducted the longitudinal study.

Just as young adult development is best understood in the context of the particular young adult's meaning-making, the ER model is best understood in the context of my particular meaning-making—the theoretical and methodological paradigms that guided me during the course of this 20-year research program. From my present vantage point, I engage in reflexivity, or “the process of reflecting critically on the self as researcher” (Lincoln & Guba, 2000, p. 183) in tracing the evolution of my meaning-making regarding personal epistemology. The intersections among my evolution as a researcher, the participants' evolution as young adults, and the evolving methodology of the longitudinal study illustrate the constructivist paradigm and place the ER model in context. I discuss four phases of my research agenda to trace this evolution, clarifying my use of the terms *positivism* and *constructivism* as the story unfolds.

PHASE 1: ASSESSING INTELLECTUAL DEVELOPMENT

My study of intellectual development began when I encountered William Perry's (1970) theory in graduate school. Perry described intellectual development as progressing from a dualistic perspective of knowledge as right or wrong, through a multiplistic perspective in which knowledge is uncertain, to a relativistic perspective in which contextual evidence justifies knowledge claims. The richness of his theory and the way it resonated with my experience with college students prompted me to adopt it as a way to understand students. My undergraduate psychology training, coupled with graduate research courses rooted in positivism, led me to interpret Perry's work using a positivist frame of reference. Lincoln and Guba (2000) described positivism as a perspective that assumes an objective external reality and emphasizes the need for inquirers to be objective in accessing that reality, and focuses on generalization and cause-effect linkages. For example, I interpreted Perry's scheme as the natural order (e.g., objective reality) of intellectual development. The linear nature of the scheme (e.g., linear causal links) seemed logical and born out in my experience. Because the scheme emphasized *how* rather than *what* people think, the core trajectory appeared context- and value-free. In my passion for promoting students' intellectual development, I generalized Perry's scheme to all students. I viewed it as a *grand narrative*, which Clandinin and Connelly (2000) described as timeless, context-free, and certain. Thus, I overlooked the theory's contextual nuances despite Perry's careful articulation of its constructive-developmental nature.

I knew that constructive-developmental theoretical frameworks such as Perry's (1970) were in tension with positivist

inquiry methods. Constructive-developmental theorists advanced that people *construct* reality and “evolve through eras according to regular principles of stability and change” (Kegan, 1982, p. 8). The major constructive-developmental theories highlighted in higher education (e.g., Gilligan, 1982; Loevinger & Wessler, 1970; Perry; Piaget, 1950) in the 1970s stemmed from interview studies to theorize how people constructed reality. These theorists generally translated this rich interview data into stages of development. As other researchers attempted to construct paper-pencil instruments for assessing people's developmental stages, they emphasized that open-ended tasks in which students produced a response provided a more accurate portrayal of development than did tasks in which students selected among options provided (e.g., Gibbs & Widaman, 1982). Scholars devised elaborate rating processes to interpret these production responses to insure a degree of objectivity and accuracy (e.g., Gibbs & Widaman, 1982; Loevinger & Wessler, 1970). These rating processes placed the original theoretical models in the forefront yet included options for identifying new theoretical concepts that might emerge from the data. Thus research attempted to maintain a degree of objectivity to enhance legitimacy while embracing basic tenets of constructive-developmental theory.

It was in this context that I spent the early years of my research program devising a paper-pencil measure of development on the Perry (1970) scheme. My dissertation was the initial validation of the measure of epistemological reflection (MER)—a short-essay production task that posed questions about the role of the instructor, learner, peers, and evaluation in learning, and the nature of knowledge and educational decision-making. These domains were central to Perry's theory. I relied on Loevinger and Wessler's (1970) data analysis processes as well as Gibbs and Widaman's (1982) model of constructing specific coding manuals for each domain. The MER coding system placed Perry's first five positions (ranging from dualism to relativism) in the foreground yet allowed for the inclusion of new categories discovered during data analysis. Subsequent studies to validate the MER resulted in a coding manual based on more than 1,000 MER responses (Baxter Magolda & Porterfield, 1988).

During this time, the question of gender differences in intellectual and moral development arose (Belenky, Clinchy, Goldberger, & Tarule, 1986; Gilligan, 1982). Belenky et al.'s (1986) study of a group of women offered a portrait of intellectual development similar to Perry's (1970) in its array of perspectives from dualistic to relativistic assumptions, yet different in important ways. Participants in both studies relied on authority for knowledge in the early phases of development, but women focused on receiving it rather than mastering it as Perry's men did. Some women used a subjective perspective involving listening to their own internal voices. Belenky et al. also identified two sets of procedures for knowing: one objective and separate from the object to be known, and one involving gaining access or connection to the

object to be known. The most complex phase of both portraits was similar in focus on constructing knowledge from relevant evidence in a context. Belenky et al. were explicit about their constructivist approach, emphasizing their five ways of knowing as context-bound and one of many multiple realities. However, it was not the constructivist perspective that created dissonance for me. It was similarities and differences with Perry's scheme that attracted my attention. Belenky et al.'s descriptions of subjectivity and connection resonated with some of the MER responses I had collected that appeared incongruent with Perry's scheme, leading me to identify the next phase of my research as exploring how gender shaped college students' approach to the nature, limits, and certainty of knowledge.

PHASE 2: ENCOUNTERING UNCERTAINTY

My longitudinal study began in 1986 with 101 first-year college students: 51 women and 50 men. This gender balance was crucial to the goal of tracing the role of gender in intellectual development. Our annual 60- to 90-minute interviews initiated a journey neither my participants nor I anticipated. Their journey as young adults centered on discovering uncertainty in knowledge, themselves, and relationships, and finding paths through uncertainty to author their own beliefs and lives. My journey as a researcher centered on discovering new theoretical and methodological frames of reference and rebalancing my research insights with existing theory. Encountering uncertainty preoccupied both participants and me in the first two years of the study.

Marcia's Journey: Encountering Uncertainty in Theory and Inquiry

Using my positivist lens on constructive-developmental theory, I began this project with inquiry methods that were "betwixt" positivist and constructivist.

Theoretical assumptions. Allowing gender-inclusive possibilities in knowing to emerge required an inductive approach. Yet my positivist theoretical bent shaped this inductive approach. Despite Belenky et al.'s (1986) insistence that their five perspectives (silence, received, subjective, procedural, and constructed knowing) were not necessarily sequential, I quickly connected them to Perry's (1970) first five positions (basic duality, multiplicity prelegitimate, multiplicity subordinate, multiplicity correlate, and relativism). I carried these theoretical constructions in my head during this early phase of the longitudinal study. Although I intended the open-ended interviews to allow for new possibilities, I realize in retrospect that I placed theory in the foreground of my inquiry. This leaned toward testing rather than generating theory, inconsistent with the constructivist notion of begin-

ning "with experience as expressed in lived and told stories" (Clandinin & Connelly, 2000, p. 40).

Methodological assumptions. Randomly selecting participants from the population of the freshman class ensured the "representative sample" needed to gain a broad picture of development, the gender balance needed to make claims about the role of gender, and legitimacy. Open-ended questions to address the domains that previous research identified as relevant to intellectual development yielded an interview guide (Patton, 1990) to ensure gathering relevant data. The interview guide thus had face validity and yet was open to new possibilities. For example, to solicit perceptions of instructors, I asked, "What do you expect from instructors to help you learn effectively?" If necessary, I used the follow-up question: "What kinds of relationships do you think instructors and students should have to make learning effective?" I also began with a version of Perry's (1970) broad opening question, asking participants to talk about the most significant aspect of their learning experiences that year, to offer them the freedom to set the interview agenda. I framed the study as an exploration of the role of gender in learning to make the study's purpose meaningful to participants and increase their investment in contributing insights to improve educational practice.

These data collection methods were both beneficial and limiting. The random sample resulted in the gender balance needed and included participants from all six academic divisions of the university. It accounted for numerous extraneous variables, thereby allowing a clearer focus on gender. One of these benefits—acquiring a sample representative of the larger population—was also a limitation. Because students of color comprised three percent of the population, the sample included three students of color. My narrow focus on gender led me to overlook the importance of race. The "guided" interview protocol yielded comprehensive data about key domains of intellectual development yet allowed room for respondents to share their particular experiences and the meaning they made of them. Its structure also led to the inadvertent omission of learning outside the classroom in Year 1 because the participants interpreted the questions as limited to the classroom. Revising the interview for Year 2 remedied this shortcoming yet still limited responses to what students viewed as relevant to the questions. Framing the study as a study about learning overlooked important dimensions of development that were not perceived (either by me or the participants) as central to learning (i.e., identity and relationships).

Collectively these methods yielded rich stories (within the limits noted here). I grounded my initial interpretation of these stories in the MER rating system. I had used Loevinger and Wessler's (1970) developing categories system to analyze more than 1,000 MER responses of both men and women prior to starting the longitudinal study. This process involved categorizing an initial set of MER responses according to Perry's (1970) five positions, using those catego-

ries to organize additional responses, and using the additional responses to construct a more extensive explanation of categories based on the empirical data. Using this process over time, I constructed the MER rating system describing young adult epistemological assumptions, empirically grounded in data despite its origins in a priori theory (primarily Perry's first five positions). Using this system as a starting point to interpret interviews balanced a priori theory with emerging theory.

Participants' Journeys: Encountering Uncertainty in Epistemological Assumptions

My approach was consistent with participants' reliance on authority in the early years of college. Their ways of knowing led them to accept and expect my setting the parameters of the study, guiding the interview, and interpreting their stories without their involvement. They often questioned whether they knew enough about learning to be helpful. Because they did not see themselves as authorities, they rarely responded to my annual summary and invitation to make recommendations to modify the interpretations. I identified two sets of epistemic assumptions, or assumptions about the nature, certainty, and limits of knowledge (Kitchener, 1983), from the first two years' interviews. These two ways of knowing form the initial phases of the ER model.

Absolute knowing. Year 1 interviews revealed that two-thirds of the 101 participants assumed that knowledge was certain and known by those designated as authorities. Jim conveyed this way of knowing in his description of learning:

The information is cut and dried. It is either right or wrong. If you know the information, you can do well. It is easy because you just read or listen to a lecture about the ideas, then present it back to the teacher. (Baxter Magolda, 1992, p. 77)

I called this perspective absolute knowing due to the certainty inherent in it. Absolute knowers translated this core assumption about knowledge to expectations for learning, including: (a) teachers communicate information clearly to students and make sure that students understand it; (b) students obtain knowledge from teachers; (c) peers share material and explain it to each other; (d) evaluation is a means to show the teacher students acquired knowledge. Nearly half the participants continued to use this way of knowing during their sophomore year.

Transitional knowing. One third of the interviewees entered college with assumptions more complex than absolute knowing. This group perceived knowledge as absolute in some arenas but uncertain in others. I labeled this perspective transitional knowing to reflect the participants' transition from certainty toward uncertainty. Carl conveyed these sentiments:

I don't particularly care for humanities, English or stuff. There's a lot of—the answers are—they can vary. There's no right or wrong answer. I like things where there's a right answer. Like in chemistry, there's a right answer, but in other classes there's not. I guess it could be easier if there's not a right answer, but I feel uneasy in classes like that. (Baxter Magolda, 1992, p. 106)

Al spoke in more detail to the dilemma of contexts in which the answers were unclear:

You do something like accounting; it's not subjective. But marketing is more subjective. When we analyze a case, there are different ways to go about it. At least from the classes I've had, there's a process you go through to analyze the case. In one class, he gave us a process, but we don't know what to do with it because he never gives us a concrete idea of what you should do. There have to be more guidelines or structure. You have to have something more firm there; there's never a straight answer. (Baxter Magolda, 1992, p. 106, 108)

Transitional knowers held many of the same expectations for learning as absolute knowers in the areas where "right" answers existed. In the uncertain areas, transitional knowers shifted from acquiring to understanding knowledge, expected teachers to focus on understanding and application, preferred evaluation focused on understanding rather than on memorization, and used peers to explore different interpretations. Students embraced transitional knowing during their college years. Slightly more than 53% of the participants used this way of knowing their sophomore year, 83% their junior year, and 80% their senior year.

Gender-related reasoning patterns. Reviewing interview data, I noted qualitatively different approaches to the two ways of knowing although I had not yet synthesized them into gender-related patterns at this phase of the study. I include the descriptions here because they reflect the participants' journeys even though they were constructed from the revised interpretation processes described in the next phase.

Two distinct versions of absolute knowing emerged in the interviews, reflecting what I came to understand as gender-related reasoning patterns. I use the term gender-related to convey that women or men in the project used one pattern more but the patterns were not exclusive to one gender. The receiving pattern, used more often by women in this group, focused on listening and recording knowledge to learn. Toni's comments exemplify this pattern:

I like to listen—just sit and take notes from an overhead. The material is right there. And if you have a problem, you can ask him, and he can explain it to you. You hear it, you see it, and then you write it down. (Baxter Magolda, 1992, p. 73)

By contrast, mastery pattern students desired participation, showing the instructor their interest and actively mastering the material. Tim's comments exemplify this pattern:

I like getting involved with the class. Just by answering questions, asking questions. Even if you think you know everything, there's still questions you can ask. When he asks questions, you can try to answer them to your best ability. Don't just let the teacher talk but have him present questions to you. (Baxter Magolda, 1992, p. 73)

The mastery pattern, used more often by men than women in this study, focused on active involvement yet still hinged on acquiring knowledge from authorities. The emergence of these two patterns clarified that active involvement did not necessarily indicate more complex ways of knowing.

Two distinct patterns emerged in transitional knowing as well. Interpersonal pattern students, more often women than men in this study, attempted to connect to the subject and to others to learn in the uncertain areas. Kris illustrated this pattern:

I get into discussions. Classroom discussions are better for me to learn. You have an opening lecture, where you have the professor discuss. Then students can contribute. Listening to other students contribute their ideas and putting in my own inputs—that makes learning better for me because it makes me think more and try to come up with more generative ideas as to what I would do in a situation. (Baxter Magolda, 1992, p. 117)

The interpersonal pattern's focus on sharing views and connecting one's perspectives with that of others' contrasted with the impersonal pattern's focus on defending views. Students using the impersonal pattern, more often men in this study, tended to stand at arm's length from others and the subject under study. Scott portrayed this approach:

The debate and discussion process for me is really interesting; I learn a lot more because I remember questions. And I guess I learn the most when I sit and I'm actually forced to raise my hand and then I have to talk. I have to sit there and think on the spot. I learn it better than in a note-taking class that is regurgitation. (Baxter Magolda, 1992, p. 126)

Interpersonal pattern students tended to focus more on others' perspectives whereas impersonal pattern students tended to focus more on their own perspectives.

The Journeys' Initial Intersection

I encountered dissonance from multiple directions in Year 3 of the project. The most salient dissonance stemmed from incongruence between my data analysis and the impressions of the participants I gleaned during interviews. This marked the first intersection of our respective journeys as participants

and researcher. From the outset of the study I coded interview data with the initial categories from the MER manual, formed new categories from new codes, and kept track of this evolving category system I used to interpret subsequent interviews. To explore the role of gender, I followed Loevinger and Wessler's (1970) system of assigning these categories to positions, translating those to numbers to analyze potential gender differences. This yielded a statistical difference in men and women's intellectual development, with men scoring higher. This difference did not ring true with my impressions during interviews or my interpretation of interview transcripts. Recognizing that the statistical difference still placed participants in the same epistemological position, I re-evaluated my data analysis process. The interpretation of gender-related patterns for absolute and transitional knowing emerged as a result.

Simultaneously, I became aware of debates in the higher education community regarding positivist and constructivist research paradigms and quantitative and qualitative inquiry. I began to study the constructivist paradigm and qualitative inquiry, finding both consistent with feminist scholarship I was concurrently reading to inform my perspective on gender. Meanwhile, student development scholars were raising questions about the relevance of existing theory for diverse student populations, suggesting that generalizing theory overlooked gender, race, ethnicity, and sexual orientation. These dynamics, and the increasing legitimacy of qualitative inquiry, prompted me to reframe my theoretical and methodological assumptions in ways that brought constructive-developmental theory, the constructivist paradigm, and qualitative inquiry together. This in turn led me to reframe how I collected and interpreted the longitudinal data.

PHASE 3: EXPLORING SYSTEMS FOR MANAGING UNCERTAINTY

Years 4 through 6 of the project focused on exploring systems for managing uncertainty both for participants and me. Participants realized that uncertainty was more pervasive than they had thought earlier in college and that they would have to assume responsibility for deciding what to believe rather than relying on external authorities. I realized that my research program generated new theoretical possibilities, and I would have to assume responsibility for articulating those possibilities rather than relying on existing theories. We all set out in search of systems to help us meet these challenges.

Marcia's Journey: Exploring the Constructivist Paradigm

Theoretical assumptions. I found the assumptions of the constructivist paradigm—realities are multiple, context-bound, and mutually shaped by interaction of the knower and known (Lincoln & Guba, 2000)—a better fit

with constructive-developmental theory than were the positivist assumptions (e.g., objective reality, context-free, researcher objectivity) I had superimposed on it. The assumption of multiple realities instead of one objective reality better reflected participants' gender-related patterns. Participants who shared basic epistemic assumptions approached knowing in different ways. What some perceived as an ideal learning environment others perceived as the worst possible one. The constructivist assumption that knowledge is context-bound resonated with participants' unique experiences and varied stories. The assumption that entities shape each other was also evident in the participants' narratives. Because they used various ways of knowing or reasoning patterns, they interpreted learning situations differently. Subsequently, their instructors sometimes altered the nature of learning situations in response to participants' reactions. This mutual shaping was occurring between researcher and participant as well. I realized that I could not separate myself from what I was observing. Participants told me that reflecting on their experience in the interviews changed their thinking about it and made them more aware of it in the intervening year (more about this later). The role of subjectivity in the study became apparent.

I found language to connect these constructivist assumptions to intellectual development in Frye's (1990) notion of naming patterns to understand the diversity of women's experiences. She wrote: "Naming patterns is like charting the prevailing winds over a continent, which does not imply that every individual and item in the landscape is identically affected" (p. 180). Developmental patterns, taken as prevailing winds, chart overarching similarities yet remain open for particularities across individuals. From this vantage point, naming patterns is aimed at generating new possibilities rather than at narrowing theoretical constructs. Considering Perry's (1970) original work from this lens clarified its constructivist nature. It also meant reconstructing my longitudinal study on a constructivist foundation.

Methodological assumptions. My gravitation toward constructivism meant aligning my inquiry with qualitative assumptions. Lincoln and Guba (2000) wrote: "Qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry" (p. 8). Realizing the need to place participants' stories in the foreground meant moving my theoretical frameworks to the background. From that position they informed my understanding but did not presuppose a particular construction from participants' stories. Rebalancing the role of my perspective and participants' perspectives warranted giving participants more freedom of expression. Loosening the structure of the interview to solicit broader stories and conducting the interview in a more flexible manner achieved a better balance of content that participants and I perceived as relevant.

These changes warranted substantial transformation in my interpretation of participants' stories. Revisiting Loevinger and Wessler's (1970) evolving category system, I noted its similarity to constructing categories based on participants' stories. Exploring alternatives that squarely placed participants' stories in the foreground, I found the grounded formal theory approach a better fit with my constructivist leanings. Glaser and Strauss (1967) proposed this approach to develop theory from systematically gathered data. Addressing the role of existing theory, they wrote:

In this methodology, theory may be *generated* initially from the data, or, if existing (grounded) theories seem appropriate to the area of investigation, then these may be *elaborated* and modified as incoming data are meticulously played out against them. . . . Researchers can also carry into current studies any theory based on their *previous research*, providing it seems relevant to these—but again the matching of theory against data must be rigorously carried out. (Strauss & Corbin, 1994, p. 273)

Because my initial category system emerged from empirical data from more than 1,000 students, it represented a relevant grounded theory to use in the longitudinal study. Because data collection and interpretation are "guided by successively evolving interpretations made during the course of the study" (Strauss, 1987, p. 10), possibilities would continue to emerge if I rigorously matched data to the grounded theory. Thus, I continued to sort the transcripts by epistemological assumptions but reread them to identify the core aspects of participants' stories. Consciously moving a priori theory to the background enabled me to name patterns, both in ways of knowing and gender-related patterns within them, in ways that were more consistent with the data. I had found a system for managing the uncertainty inherent in viewing personal epistemology through a constructivist lens.

This process yielded the four ways of knowing and reasoning patterns within them reported in *Knowing and Reasoning in College* (Baxter Magolda, 1992). This volume contains the guiding assumptions of my journey as a researcher to that point. These included: Ways of knowing and patterns within them are socially constructed, context-bound, and best understood through naturalistic inquiry, and represent possibilities; and reasoning patterns are fluid and gender-related rather than dictated by gender. These guiding assumptions resonated with Strauss and Corbin's (1994) view of grounded theory as fluid due to its focus on the interaction of multiple actors, temporality, and process.

Participants' Journeys: Exploring Systems to Guide Beliefs

Uncertainty became increasingly prevalent in the fourth- and fifth-year interviews. Although 80% of the seniors used transitional knowing, it dropped off considerably in light of ex-

pectations inherent in life after college. Participants searched for ways to make decisions in the face of increasing uncertainty.

Independent knowing. Independent knowing, characterized by viewing most knowledge as uncertain, became the predominant way of knowing for 16% of the seniors. Laura described how it emerged for her:

I became very skeptical about what the “truth” was. It’s amazing how you can influence statistics. Statistics are supposed to be really the truth. You can’t manipulate statistics. But then I learned you really can manipulate statistics to have a point of view to be the truth. (Baxter Magolda, 1992, p. 138)

Once Laura realized that statistics could be manipulated to construct a view of the truth, she abandoned the notion that knowledge is certain. Instead, she concluded

Everything’s relative; there’s no truth in the world—that sort of thing. So I’ve decided that the only person that you can really depend on is yourself. Each individual has their own truth. No one has the right to decide, “This has to be your truth, too.” (Baxter Magolda, 1992, p. 136)

Independent knowing changed expectations for learning. Independent knowers focused on thinking for themselves, sharing views with peers to expand their thinking, and expecting teachers to promote independent thinking and avoid judging students’ opinions.

For participants who had focused on listening to others, the struggle in independent knowing was to learn to listen to oneself. This characterized the interindividual pattern within independent knowing, used most often by women in this group. Alexis’ story reveals the tension between listening to others and identifying her own beliefs:

I like to listen to their arguments for it; then I listen to other people’s arguments against it. And then it’s just my own personal view, really, whether I can establish the credibility—so I guess it really stems from the credibility of the person who’s saying it also, as well as just the opinion on it. I listen to both sides. I usually throw some of my own views into it as well. So I’m influenced by other people—like each member of the group should be influenced by each other. But when the final vote comes in, you should go with what you believe. (Baxter Magolda, 1992, pp. 147–148)

Alexis was so accustomed to subjugating her voice that it was difficult for her to express it. Lowell, on the other hand, could readily bring his voice forward. He struggled to listen to others as he used the individual pattern of independent knowing. His comments illustrate this pattern:

I’d consider myself conservative. And there was one guy in our group who was quite liberal and acknowledged it. I guess it gave me another viewpoint, another aspect to look at this. Like it or not, we’re all kind of ingrained one way or another, whether it’s the liberal end or the conservative end. He looked at it in this way, and I looked at it in another way. And everybody in the group had their own ways on it. [You had] to try to get your point across without sounding too dominating—I’m searching for words and not finding them. To try to listen to theirs, to *really* listen, not to just hear it and let it go through. And then to try to take that into account and reach a compromise. There was quite a bit of discussion. But I don’t think the attempt was to try to change each other’s mind. It was just, “Your point is all right, but you’ve got to look at this part, too, because this is as relevant.” (Baxter Magolda, 1992, pp. 136–137)

Movement into independent knowing occurred more readily in employment and graduate school contexts as evidenced by 57% using it in Year 5 interviews. Interviewees reported that employers and graduate faculty asked them to assume responsibility for their thinking and work. Employers and faculty expected them to evaluate multiple perspectives, to bring their own perspective to their work, and to choose plans of action accordingly. Unfortunately, many had not yet developed criteria for choosing from among alternatives. They soon discovered that everything was not relative.

Contextual knowing. Identifying criteria from which to make choices first appeared in contextual knowing, characterized by the belief that knowledge exists in a context and is judged on evidence relevant to that context. Only 2 of the 80 participants who remained in the study their senior year adopted this way of knowing. It replaced earlier ways of knowing gradually in the initial years following college, primarily due to the constant expectation that young adults function in this way. Anne portrayed the experience of many of her peers as she described realizing what was expected of her at work:

I guess you just do it because you have to. You have to come up with some answers. Just kind of bumble through it I guess, try to rationalize things out. I wrote down some solutions and wrote down pluses of the solutions. Then I’d try to think of what kind of questions my boss would ask, like “What would happen if we did this?” and “Where did you get these numbers?” ... Before, I would make a decision and take it into my boss. But now I’ve learned to say to myself, “What’s he going to want to know? Have you thought of everything?” And it’s made me go back and rethink everything and come up with some other alternatives and just make sure what I’m thinking is good. (Baxter Magolda, 2001, p. 243)

Being challenged to carefully ponder choices and offer defensible solutions simultaneously challenged participants to integrate the reasoning patterns evident in earlier ways of knowing. Contextual knowing required connecting to others

and the subject to be known yet at the same time required standing back to analyze the situation. Mark, contemplating a decision about marriage, described contextual knowing involving both patterns:

As far as firm and personal life, I sit down and I write down things I know, pro and con, “Go into a relationship,” “Don’t go into a relationship,” cost-benefit kind of analysis. Like I said, I don’t leave my rationality behind because I think that’s really an effective tool. And then I think about all my options, and there’s something about it. It carries on its own momentum. . . . So I listen to those feelings, and I come to my room and I sit down and I push all my books away. I grab a sheet of paper or whatever and start writing things down, how I feel. And then when I feel like I’ve got a handle on those feelings and options, then I talk to the people affected. . . . When you bring other people into it, you push your feelings down just a touch because then you want to be open-minded again at that point. And then you talk to people unaffected by it, too, because obviously when people are affected by it they’re invested in it. . . . I don’t let my feelings rush me into anything because . . . you’re dealing with personal life more—if you do something rash, it can cost you a lot. (Baxter Magolda, 2001, pp. 42–43)

Participants experienced the need to establish criteria for knowing and recognized that they had to decide for themselves. Yet they often continued to look to external sources for guidance.

External formulas. Interviews from Years 5 and 6 revealed that many participants used external formulas to guide their lives regardless of their ways of knowing. Mark, whose story was just described as an example of contextual knowing, still approached law school using a formula for success:

I came here and I tried to figure out what the legal culture figures is success. I knew a Supreme Court clerkship was, so one of my goals was to aim towards that. So I got here to law school and I figured out, “Okay, well, to be a success here you have to get to know some professors who are influential with judges to get a good clerkship, to get in the pipeline, get in the star system here. Also get on *Law Review*. Write a paper here that you can publish.” I thought, “Okay, this is kind of the plan then, step by step.” The ultimate plan for success in the legal culture, I mean, go to [this] Law School and do these things, then you’ve got it made. . . . I would be in the *ultimate* position to do whatever I want to do because I will have done *everything* possible, and then I’d be in a position to make a choice that reflected exactly who I was, or at least more clearly. (Baxter Magolda, 2001, p. 41)

Likewise, Gwen, the other contextual knower during her senior year, offered this post-college perspective:

We’re taught to make [our] plan. Plan your work and work your plan and you’re going to get where you want to go. . . . I could set my sights on something and it would happen. And I would generally know some of the things I needed to do to get there. If you want this, then do this, this, and this, and it happened. (Baxter Magolda, 2001, p. 43)

On leaving college, longitudinal participants did what they had been taught to do best—follow authorities’ leads to manage uncertainty.

The Journeys Converge at a Crossroads

Initially these interviews confused me. I wondered how so many seniors could construct the world from the vantage point of transitional knowing. Yet I wondered why those who had shifted to independent or contextual knowing still used external formulas to approach life after college. The gender-related patterns merging as the epistemological journey progressed surprised me. Post-college environments prompted movement toward independent and contextual knowing faster than did the college environment, which was disconcerting.

Fortunately, participants’ journeys prompted them to infuse their understandings of these dilemmas into interviews. Many volunteered that learning was not a meaningful framework for their post-college experience and asked to talk about their experience in general instead. These broader conversations revealed that other developmental dimensions (e.g., identity and relationships) mediated their intellectual development. My study of Kegan’s (1994) theory emphasizing the intertwining of the cognitive, intrapersonal, and interpersonal developmental dimensions informed this interpretation. Participants also addressed specific challenges and supports they found in their work, advanced education, and personal contexts, and their reactions to them. Their rapid transformation in these new environments called into question my theoretical assumptions about the nature of development.

PHASE 4: REBALANCING EXISTING KNOWLEDGE AND NEW PERSPECTIVES

As participants were solidifying their beliefs about themselves and the world in the years after college, I was solidifying my constructivist theoretical and methodological assumptions. Our journeys converged into a joint path as we rebalanced existing knowledge with our own voices and experience. Participants’ voices moved to the foreground as they authored their own lives. I moved the data and our construction of it to the foreground, authoring new theoretical possibilities. Our journeys again mediated the conduct of the study as we became partners in interpreting the nature of ER.

Marcia's Journey: Putting Existing Theory in Perspective

Theoretical assumptions. The use of external formulas after college by participants who had adopted independent and contextual ways of knowing perplexed me. The post-college interviews revealed that three questions were salient in participants' 20s: How do I know, who am I, and what kind of relationships do I want? These three questions were intertwined in their stories. The stories resonated with Kegan's (1994) portrayal of holistic development as the intertwining of cognitive (i.e., how do I know?), intrapersonal (i.e., who am I?), and interpersonal (i.e., what kind of relationships do I want?) dimensions. Rereading Perry (1970), Belenky, et al. (1986), and Loewinger and Wessler (1970) revealed that they had foreseen this connection years earlier. Interviewees who developed complex ways of knowing often could not live those ways of knowing until they had developed complex ways of seeing themselves and their relations with others. Recognizing the value of interviewees' broader life stories beyond the epistemological dimension led me to explore *narrative inquiry*, "the activities involved in working with the various kinds of stories of life experiences found in life histories, long interviews, ..." (Schwandt, 1997, p. 98). This solidified the need to move interviewees' narratives to the foreground of my meaning-making.

Following participants' lives for 12 years after their college graduation yielded a wide range of experiences in diverse settings characterized by a broad continuum of challenge and support. The complex interplay of participants' assumptions about themselves and their worlds, the assumptions they encountered, and the contexts in which these encounters took place shaped their particular meaning-making. In some cases transformation was gradual; in other cases it was surprisingly rapid. Analyzing these dynamics led me to abandon my earlier theoretical assumption that development is a gradual process, naturally unfolding in logical sequence. I now view existing developmental models as descriptions of how contexts have shaped young adults (in interaction with young adults' current meaning-making) rather than as descriptions of what is possible in terms of developmental growth. Higher education focused on knowledge acquisition has trained students to be transitional knowers; alternative higher education contexts (e.g., focused on knowledge construction) might make complex meaning-making possible at much earlier ages than I have encountered it to date.

Collectively, these theoretical assumptions form my constructivist interpretation of ER. They also altered the conduct of the longitudinal study.

Methodological assumptions. In the years after the participants finished college, my interview protocol steadily moved toward an informal conversational interview (Patton, 1990). Realizing the richness inherent in narratives emerging from participants' sense of what was important, I asked fewer

and fewer questions. These unstructured interviews (Fontana & Frey, 1994) invited participants to shape the interview. Participants volunteered topics of importance that emerged in the year between our annual interviews, talked freely about them, and explored their meaning in response to my probing questions about what it meant for them or why they perceived it a particular way. Having read summaries and books about the project, participants knew that how and why they made meaning was a primary focus. My focus on listening to their stories, constantly asking for the meaning behind their thinking or how they arrived at their current perspective, provided opportunities for self-reflection. As Ned shared, the interview was an opportunity for introspection:

I don't often get the opportunity for someone to ask these tough questions to figure out my framework. It is very parallel to discussions with my close friend—at the beginning I had no idea what I'd say; then I recognize things I need to think more about.

Many interviewees noted that this kind of introspection and discussion to identify how they made meaning was rare in their daily lives. They relished an interview format that encouraged exploration and let them set the agenda. They were most likely shaped by participating in it. The rapport established from our long association enriched these reflections and contributed to participants' comfort in sharing personal details of their lives. Respecting participants' privacy is an important component of building trust and rapport that enables this level of intimacy (Baxter Magolda, 2001). Acknowledging that this partnership affects participants' meaning-making is another aspect of the constructivist nature of the project. The ER model is context-bound by virtue of participants' reports that they are aware of how they make meaning due to their participation in the project. Our intertwining journeys offer insight into the partnerships that promote personal epistemology.

As participants and I became partners in exploring their meaning-making in interviews, we gradually became interpretation partners. My willingness to rebalance existing and new perspectives led to shifting grounded theory methodology (Strauss & Corbin, 1994) to generate theory from the data rather than match data to existing grounded theory. I no longer sorted transcripts by epistemological position. Instead, I reviewed each year's transcriptions of the taped interviews and coded them into units. I then sorted the units into categories to identify themes and patterns from the data. This is what qualitative researchers call "allowing themes to emerge." Rereading data for each participant across years resulted in successively evolving interpretations and further development of patterns. Two research partners joined me to reread and analyze the post-college data. Each of us prepared summaries of themes individually followed by meetings in which we discussed and synthesized our perceptions. This use of multiple analysts helped mediate our subjectivities and

increase the adequacy of our interpretations. Prolonged engagement to build trust and understanding and member checking to assure accuracy of interpretations enhanced the credibility of the themes and patterns. Participants were increasingly willing to explore my interpretations and offer their feedback. I shared drafts of publications with participants' whose stories were told in-depth and solicited their input on these interpretations. Interviews following the publication of *Making Their Own Way* (Baxter Magolda, 2001) included conversation about their reaction to my construction of the collective group's experience. Participants now routinely refer me to books or articles they have read that inform the project.

Participants' Journeys: Putting External Authority in Perspective

Participants' experience with external formulas led to crossroads where external and internal influence collided. Moving internal influence to the foreground and becoming authors of their lives was consistent with the partnership emerging in the longitudinal study. As their internal voices emerged and gained strength, they were increasingly willing to join me in making meaning of their experiences.

Crossroads. The emergence of the intrapersonal and interpersonal dimensions of development in the post-college interviews led me to shift from placing ways of knowing in the foreground to placing phases in the journey toward self-authorship in the foreground. For the shift to internal decision-making needed for independent and contextual knowing to occur, similar shifts needed to occur in the intrapersonal and interpersonal dimensions. The crossroads marked a phase in which participants recognized the need for internal self-definition and decision making but were struggling to make this shift. Kurt spoke eloquently about this phase:

I'm the kind of person who is motivated by being wanted, I think. I've gone to a couple of workshops and, either fortunately or unfortunately, I'm the kind of person who gets my self-worth on whether or not other people accept me for what I do or other people appreciate what I'm doing. ... I'm coming from a position where I get my worth and my value from other people, which is, I think, wrong for me to do. But that's where I am right now. I feel like whether or not I choose to be happy is dependent upon me and only me. ... The power of choice is mine. I have a choice of how I want to perceive each and every situation in my life. ... Obviously I'm not to that point yet because I choose to make myself happy and make myself sad on what other people are thinking. (Baxter Magolda, 2001, pp. 98–99)

Arrival at this crossroads stemmed from dissatisfaction with external formulas and environmental challenges to shift the balance of external and internal voices in meaning-making.

Shifting the balance to place their internal voices at the center of meaning-making led to self-authorship.

Becoming the author of one's life. Becoming the author of one's life meant taking responsibility for one's beliefs, identity, and relationships. The internal voice became the coordinator of meaning-making in all three dimensions of development. Mark's comments illustrate this notion:

Making yourself into something, not what other people say or not just kind of floating along in life, but you're in some sense a piece of clay. You've been formed into different things, but that doesn't mean you can't go back on the potter's wheel and instead of somebody else's hands building and molding you, you use your own, and in a fundamental sense change your values and beliefs. (Baxter Magolda, 2001, p. 119)

Dawn's narrative reveals how changing values and beliefs involves all three dimensions:

The more you discover about yourself, the more you can become secure with it. And that obviously leads to greater self-confidence because you become comfortable with who you really are. ... I'm more willing to express my ideas and take chances expressing my ideas. ... I'm not as afraid to be willing to say that because of what I am this is how I feel. ... And I think self-awareness too, because you realize that it doesn't really matter if other people agree with you or not. You can think and formulate ideas for yourself and ultimately that's what's important. You have a mind and you can use it. ... You can form an opinion that's more important than the opinion itself. So it's kind of a self-confidence and self-awareness thing. (Baxter Magolda, 2001, pp. 152–153)

Because Dawn's internally defined sense of self (intrapersonal) made her more secure, she worried less about how others viewed her (interpersonal). This freed her to express her thinking and recognize her ability to use her mind (epistemological). Framing responses to the questions "how do I know," "who am I," and "what kind of relationships do I want" from this internal perspective yielded self-authorship.

Internal foundation. In their late 20s and early 30s, many participants were increasingly comfortable with their identities and beliefs, and how they related to others. As they constructed frameworks to answer the questions about what to believe, who to be, and how to relate to others, the frameworks solidified to form comprehensive belief systems. The framework for "who I am" solidified into a solid sense of self that made participants feel "personally grounded" and able to be true to themselves in all dimensions of their lives. This sense of self contributed to their ability to choose core beliefs and integrate them into an internal belief system that guided their lives. The security of the internal self and belief system afforded them a new vantage point from which to engage in authentic,

mutual relationships with others. Solidifying the internal self, belief system, and approach to relationships created both a solid foundation and openness to ambiguity and change. Becoming comfortable with the internal voice yielded a security to explore others' perspectives; complex ways of knowing meant ambiguity and uncertainty would always be commonplace. Sandra's comments convey this phase of the journey:

I have a clearer vision of what I really want to do. I have a stronger image of who I am. I'm not so wrapped up in being a counselor, I'm being Sandra. I have a clearer vision of Sandra and the different things that make up who I am. I went from "I am a counselor" to "I do some social work." I am not afraid to say what I believe in and stand for it. I don't make reckless decisions that hurt my lifestyle or self—like quitting my job—but I am able to say, "This is how it is." ... To help others, you have to maintain self. Now that I'm out of my old job, I recognize the point where I began to lose myself. If it happens again, I see it and don't do it. I don't worry much. I'm confident that I do a good job; I know this. If others disagree, they can find someone else. I have a lot of feedback that I trust is the truth. I've taken charge and get things done. I am more confident. I am able to recognize signs more quickly now. It sounds nonchalant, but that is how I feel. Some of that was blurry in my old job. I knew some things I wouldn't do, but as we were speeding towards them, I couldn't tell how many I would do. Now I can see the line, and know what I won't do. (Baxter Magolda, 2001, pp. 166, 168)

Because Sandra had a solid internal sense of self and belief system, she functioned authentically in her work environment. She imagined change as acceptable because she knew her foundation would remain intact. Participants built these internal foundations at varying paces in their early thirties depending on the complex interplay between their ways of viewing the world and contexts they encountered.

PARTNERSHIPS FOR PROMOTING AND RESEARCHING PERSONAL EPISTEMOLOGY

Longitudinal participants experienced growth in complex, fluid environments that emphasized social construction of knowledge, the participants' role in it, and mutual engagement with experts in knowledge construction. From their descriptions, I developed the learning partnerships model, a framework for constructing these transformational contexts (Baxter Magolda, 2001; Baxter Magolda & King, 2004). The framework reinforces my constructivist interpretation of personal epistemology and self-authorship in its emphasis of the social construction of knowledge and the centrality of personal meaning-making in interpreting experience.

Learning Partnerships in Educational Practice

Some longitudinal participants experienced learning partnerships during college; more experienced them after college.

Their post-college contexts offered substantial challenge accompanied by substantial support. Challenge came in the form of three core assumptions inherent in contexts participants viewed as growth producing: Knowledge is complex and socially constructed; self is central to knowledge construction; and authority and expertise are shared in mutual knowledge construction among peers. Complexity and social construction of knowledge emphasized using multiple perspectives to make choices in context, thus modeling epistemological complexity. Self as central to knowledge construction emphasized that one's identity must come into play in deciding what to believe, thus modeling intrapersonal complexity. Sharing authority and expertise emphasized mutual negotiation of knowledge, thus modeling interpersonal complexity.

Support to meet these demands took the form of three principles: validating learners as knowers, situating learning in learners' experience, and defining learning as mutually constructing meaning. Affirming learners' ability to construct knowledge, although not necessarily the knowledge they had currently constructed, welcomed them into the knowledge construction process. Situating learning in learners' experience gave them a base from which to construct knowledge connecting their experience to the task at hand. Defining learning as mutually constructing meaning affirmed the expectation that learners participate in knowledge construction.

Although these assumptions and principles took diverse forms in diverse contexts, they were prevalent in employment, graduate school, professional school, and community settings. Extensive stories illustrating this model in diverse settings (Baxter Magolda, 2001; Baxter Magolda & King, 2004) reveal rich but fluid possibilities for educational practice. The prevailing winds of the model suggest that educators and learners must be collaborative partners in the journey toward self-authorship. Creating contexts in which learners experience the complexity of the world around them helps them encounter new assumptions. Mutually engaging learners in reflecting on the interplay between new and existing assumptions and inviting them to take responsibility for their beliefs, identities, and relationships enables self-authorship. These partnerships are fluid and evolving, their nature congruent with the constructivist nature of personal epistemology. The evolution of my partnership with longitudinal participants described here is one example that has afforded them and me the opportunity to encounter new assumptions, compare them to existing ones, and reshape beliefs accordingly. They used these experiences to assist in self-authoring their lives; I used these experiences to self-author the construct of personal epistemology. Educational practice using the learning partnerships model would offer similar contexts for transformation to learners.

Learning Partnerships in Future Research

This special issue raises numerous questions about the nature of personal epistemology, its components and their intercon-

nections, and the interplay of internal and external factors in developmental change. Viewing personal epistemology as complex and socially constructed necessitates future research including the multiple components and clarifying their potential interconnections. Viewing the self as central to knowledge construction suggests future research focused on how people use their current epistemological assumptions to actively construct meaning and new perspectives. Simultaneously, viewing authority and expertise as shared in knowledge construction portends research focused on the interplay between internal and external factors in developmental change. Working collaboratively across paradigms and approaches, as is the intent of this issue, aids in exploring these complex possibilities.

My partnership with my participants over the years has significantly altered my assumptions about personal epistemology and how it develops. One important aspect of this partnership is its longitudinal nature, allowing for tracing transformation over time and context. My study contributes to understanding the personal epistemology of a group of white young adults who attended a selective liberal arts college. Similar studies could contribute to understanding the personal epistemology of groups with varying races, ethnicities, economic classes, and sexual orientations. Conducting these studies in a range of college contexts would enhance understanding of the environmental influence on personal epistemology. Another important aspect is the partnership itself, the interweaving of perspectives and evolving journeys as we pursue understanding. Analyzing our relationships with our participants, their effects on participants and the research, and reflexivity about our own research will enhance our inquiry and the possibilities we are able to generate from it.

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