Toward a Prototype of Expertise in Teaching: A Descriptive Case Study

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TOWARD A PROTOTYPE OF EXPERTISE IN TEACHING
A DESCRIPTIVE CASE STUDY

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This study used a prototype view of teaching as a theoretical framework to interpret, analyze, and describe the behaviors and verbal responses of three expert teachers and to determine the degree to which these three teachers share a "family resemblance" to one another. A case study that provides descriptions of what expert teachers do and say contributes to our understanding of the complexity of expertise in teaching. Analysis of data collected for this study reveals six central tendencies of the three participants. The rich descriptions and summary representations provide specific and complex profiles to inform teacher educators and professional development providers in their efforts to improve professional practice among teachers.

Keywords: *teacher expertise; teacher effectiveness; teacher quality*

> The question of what it means to be an expert teacher has taken on some urgency in the nationwide effort to reform public education. If American public schools are to become centers of excellence, then their most important human resource (i.e., teachers) must be effectively developed. To know what we are developing teachers toward, we need a model of teaching expertise.
>
> Sternberg and Horvath (1995)

For centuries, people in all societies and cultures have had an interest in exceptional performance. We have lauded the finest painters, the most outstanding musicians, the strongest athletes, and the greatest scientists. We have marveled at the "gifts" of such outstanding individuals, accepting their talents as anomalous, innate phenomena. In the last 25 years, however, psychologists have begun to study expertise as a cognitive phenomenon.

The study of expertise seems to fascinate us because it speaks to the possibilities of human endeavor. Maslow (1971) expressed it this way:

> If we want to know how fast a human being can run, then it is no use to average out the speed of a "good sample" of the population; it is far better to collect Olympic gold medal winners and see how well they can do. If we want to know the possibilities for spiritual growth, value growth, or moral development in

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> a human being, then I maintain that we can learn most by studying our moral, ethical, or saintly people. . . . Even when "good specimens," the saints and sages and great leaders of history, have been available for study, the temptation too often has been to consider them not human but supernaturally endowed. (p. 7)

Maslow's statement helps to justify an examination of expertise. His statement implies that the lens of supernatural endowment limits our consideration of human potential.

Most studies of expertise in teaching (as well as other domains) have compared the behaviors and performances of novices to those of experts (Berliner, 1988; Carter, Sabers, Cushing, Pinnegar, & Berliner, 1987; Chi, Glaser, & Farr, 1988; Cushing, Sabers, & Berliner, 1992; Glaser, 1984; Gonzalez & Carter, 1996; Livingston & Borko, 1990; Noice & Noice, 1997; Swanson, O'Connor, & Cooney, 1990; van der Mars, Vogler, Darst, & Cusimano, 1991). In addition, many studies rely on experimental or simulated tasks to examine the complexity of expertise (Berliner, 1988; Carter et al., 1987; Chase & Simon, 1973; Cushing et al., 1992; de Groot, 1946/1965; Feltovich, Ford, & Hoffman, 1997; Noice & Noice, 1997). Rather than contrasting two diverse experienced groups, the present study utilized the similarity-based category of experienced experts and a more naturalistic approach to the study of expertise in teaching. Although the participant focus was narrower, the scope of discovery was wider, yielding richer information about a more particular set of participants.

Other studies that have examined the issue of expertise have operationalized expertise as a function of experience (e.g., Gonzalez & Carter, 1996). Since the mid-1980s, expertise has frequently been identified with a certain disposition, particularly that of the reflective practitioner (Schön, 1983, 1987). Still others have developed "checklists" of expert behaviors or dichotomous tables to be used as determinants of expertise or nonexpertise. Sternberg and Horvath (1995) reject these models and suggest that such simple methods cannot measure the complex phenomenon of teaching expertise. They maintain that there is no well-defined standard that all experts meet and that no nonexperts meet. Instead, they assert, "Experts bear a *family resemblance* [emphasis added] to one another, and it is their resemblance to one another that structures the category 'expert'" (p. 9). The present study used case study methodology to explore this notion of family resemblance among expert teachers. The researcher's hope is that this study of expertise in teaching will provide a rich description of what it means to be an expert teacher and that such a description will provide direction for teacher educators and those who provide professional development to practicing classroom teachers.

THEORETICAL PERSPECTIVE

Three models of expertise influenced the framework of this study. The first was the standards-based model of the National Board for Professional Teaching Standards (NBPTS). Experts, or accomplished teachers, as they are called by NBPTS, are those who demonstrate accomplished practice in portfolio and assessment center exercises. The standards used to judge teacher practice are content specific and emerged from consensus among practitioners rather than from empirical research. Teachers determined by NBPTS to be accomplished are awarded national certification that is renewable every 10 years. The NBPTS model of expertise was used to select the cases for this study. All three teachers in this study have been certified by NBPTS.

A second model of expertise that influenced this study was the model developed by Hattie, Jaeger, Strahan, and Baker (1998). This model was designed for the purpose of conducting a validation study of certification decisions made by NBPTS. The goal of this study was to determine if teachers certified by NBPTS are different and more expert than those not certified. Based on a synthesis of 134 meta-analyses related to student outcomes and effects of schooling and an extensive review of the literature related to domain-specific expertise, Hattie et al. propose four major attributes of expertise in teaching: content knowledge, pedagogical knowledge, affective attributes, and comparative teaching outcomes. These attributes have been further

separated into 13 specific dimensions. Definitions and rubrics were developed for scoring each of these dimensions. The study was conducted by researchers at the Center for Educational Research and Evaluation (CERE) at the University of North Carolina at Greensboro.

In their validity study of the National Board for Professional Teaching Standards' assessments, Hattie et al. (1998) drew heavily from the third model of expertise that influenced this study. This model, the prototype view of teaching expertise, was developed by Sternberg and Horvath (1995). They suggest that one way to talk about the expert category of teaching is in terms of a "*prototype* that represents the central tendency of all the exemplars in the category" (p. 9, emphasis in original). This prototype can serve as the summary representation of a similarity-based category of expertise. Sternberg and Horvath examined psychological research on expert performance in a variety of domains to develop their model of expertise in teaching.

Although the thorough standards and assessment development processes of NBPTS were systematic and rigorous and the comparative practices study of Hattie et al. (1998) seems comprehensive in its identification of comparative teaching practices and outcomes, some would still argue that these models of teacher expertise compromise the complex and holistic nature of teaching. Sternberg and Horvath (1995) call for a "reconceptualization of teaching expertise" in which teaching expertise is viewed as a category that is structured by the similarity of expert teachers to one another rather than by a set of necessary and sufficient features. They further argue that a prototype of teacher expertise can be represented by the central tendencies of teachers in this category. This prototype can serve as the summary representation of a similarity-based category.

The notion of prototype is derived from Rosch's (1973, 1978) cognitive psychology research on natural language concepts. This work postulates that similarity-based categories exhibit a graded structure wherein some category members are better exemplars of the category than are others. The prototype may be thought of as "the central tendency of feature values across all valid members of the category" (Sternberg & Horvath, 1995, p. 10). The greater the similarity between the subject and the prototype, the greater the probability that it belongs to the category.

Sternberg and Horvath have deduced from Rosch's investigations three properties of prototype-centered categories. First, they suggest that different members of a category may resemble the category prototype on different features. Second, they explain that an important property of a prototype model is the differential weighting of features in the computation of the overall similarity to the prototype. Finally, the features that make up a category prototype may be correlated. Whereas most studies using the similarity-based categorization have required subjects to categorize objects such as musical instruments, birds, fruit, or chairs (see Fehr, 1993; Lakoff, 1987), the present study and Sternberg and Horvath (1995) attempt to apply the properties of a prototype-centered system of categorization to the complex notion of expertise in teaching.

Sternberg and Horvath (1995) call their theoretical orientation a synthetic framework meant to stimulate research and debate. The present study is, therefore, an exploration of their framework and the prototype view of expertise in teaching. The rationale for including only National Board Certified Teachers (NBCTs) in this study is to select teachers who have been identified as experts based on a set of established and well-respected professional standards to generate a descriptive prototype of teaching expertise.

The benefits of the prototype model of expertise include the following:

- A prototype view allows a richer, more descriptive, and inclusive understanding of teacher expertise without making everyone a presumptive expert;
- a prototype view provides a basis for understanding of "general factors" in teaching expertise; and
- a prototype view provides a basis for understanding and anticipating social judgments about teaching expertise.

In this study, a prototype view of teaching was used as a theoretical framework with which to interpret, analyze, and describe the classroom behaviors/practices and verbal re-

sponses to structured interviews of three expert teachers and to determine the degree to which these three teachers share a family resemblance to one another. The prototype framework was appropriate for this research because it does not segment teaching into distinct or isolated behaviors; rather, it provides a more holistic way to examine the complex nature of expertise in teaching. The bounded system for this collective case study was a group of three North Carolina teachers who have achieved NBPTS certification and who participated in the validity study conducted by the Center for Educational Research and Evaluation.

A case study that provides descriptions of what expert teachers do and say will contribute to our understanding of the complexity of expertise in teaching. In addition, this case study analyzes the notion of a similarity-based, family resemblance view of teaching expertise and will help us consider the applicability (not generalizability) of a prototype model of teaching expertise. The rich descriptions and summary representations provide specific and complex profiles to inform teacher educators and professional development providers in their efforts to improve professional practice among teachers.

RESEARCH QUESTIONS

The following grand tour question guided this study: How are these three teachers similar in terms of their teaching behaviors, practices, and attitudes? Additional research questions evolved during the study. Because the prototype of expertise that would emerge from this research would be communicated verbally with data collected from the participants' school and classroom contexts as well as other self-reported data, their language became very important to the understanding of the nature of expertise. The following questions guided collection and analysis of data:

1. What words and phrases do these teachers use to describe their practice?
2. What meanings do these teachers attach to these descriptions?
3. What concepts related to teaching practice appear for each individual participant?
4. What concepts related to teaching practice appear across participants?
5. How can these concepts be categorized and integrated into a prototype that represents the central tendency of these teachers?

METHODOLOGY

Case study research was chosen as the method of inquiry because it allows the researcher to capture and describe the complexity of real-life events (Stake, 1995; Yin, 1994). Case study represents a disciplined mode of inquiry that can be organized around issues. The case study researcher is charged with the responsibility of conducting an in-depth analysis of a case and may emphasize "episodes of nuance, the sequentiality of happenings in context, [and]the wholeness of the individual" (Stake, 1995, p. xii). This study provides holistic and meaningful descriptions of the pedagogical and affective attributes of the expert teachers who participated in this study as well as a summary representation of the expert prototype that emerged as a result of the data analysis. Case study research is also an appropriate mode of inquiry because a prototype can best be generated from a cross-case analysis. That is, a holistic case approach provides the best path to a descriptive prototype of expertise in teaching.

Participants

The participants are three North Carolina teachers who have achieved National Board certification. One participant is certified in the Early Adolescence/English Language Arts area, and two are certified in the Middle Childhood/Generalist area. All three were classroom teachers in different schools during the 1998-1999 school year.

Data Sources

Data for this study were collected from a variety of sources: preobservation questions, audiotapes of lessons, lesson transcripts, structured interviews, participant surveys, narrative records of classroom observations, live action coding, documented accomplishments arti-

facts, researcher notes, and e-mail correspondence between the researcher and each participant. These multiple data sources were used to provide a holistic view of each teacher's classroom and behaviors.

Preobservation questions. Preobservation questions were transmitted by facsimile to teachers approximately 2 days prior to the classroom observation. Teachers were asked to respond to general questions related to the lesson to be observed and the context of the unit in which the lesson was being taught (e.g., What are your goals for the lesson we will observe? How do these goals relate to previous lessons? How will you know what to teach next?). Observers reviewed the questions just before the observations began to get a sense of the subject matter being taught.

Audiotapes of lessons. Each lesson was audiotaped to preserve the exact language of the teachers and students. Whereas transcripts provided the more primary medium for analysis of the lessons, audiotapes were also reviewed to examine teacher tone, wait time, and responsiveness to students.

Transcripts of lessons. Lessons were transcribed verbatim from audiotapes. A sophisticated tape recorder and microphone were used to capture the words of students and teachers during the lesson observation.

Structured interviews. An interview protocol (from the Hattie et al., 1998, study) that included questions related to the dimensions of pedagogical content knowledge and affective attributes was used to provide structure and consistency to teacher interviews. The protocol includes items to stimulate think-aloud responses as well as responses to hypothetical and context specific situations. Additional questions ask teachers to talk about their students as a group and as individuals. Three randomly selected students served as subjects of several questions and probes.

Participant (teacher) surveys. A survey consisting of items derived from the Patterns for Adaptive learning Survey (PALS) and the National Writing Project Survey were administered to candidates. The items on these surveys are related to teacher goal orientation and feedback to students.

Narrative records of classroom observations. During the on-site observations, one observer kept a "running record" of events in the classroom. This observer noted the body language, classroom and teacher movement, facial expressions, and other important information that could not be captured via audiotape.

Observer-participant live-action coding. A second observer used a form to capture specific aspects of the classroom action, including activity, feedback, student behavior, and teacher response. The information that was analyzed in this study included the records related to "type of activity," "feedback," and "teacher response."

Documented accomplishments artifacts. The documented accomplishments responses were prepared by the teachers as they developed their portfolios for National Board certification. One of these artifacts was related to professional service, commitment, and leadership; the other was related to the teachers' efforts to create partnerships with families. The researcher reviewed these documents during open coding as categories were generated for each teacher.

Researcher notes. The researcher kept written records of analysis records and information from telephone conversations with members of the audit panel. Often, the information provided clarity or insight related to data that had already been collected.

E-mail correspondence. As a courtesy, the researcher e-mailed participants about once every 2 weeks to keep them apprised of the progress of the research. Sometimes, the researcher would ask a question or two for clarification or to test alternative explanations for patterns that were emerging in the data.

Analysis of Data

The analytic tools and coding procedures of Strauss and Corbin (1998) seemed appropriate for analyzing the data for this study. Their pro-

cedures provide an open analysis approach appropriate to exploratory research such as this case study. They state that they "have something to offer in the way of techniques and procedures to those researchers who want to do qualitative analysis but who do not wish to build theory" (p. x). They suggest that building theory is not the only reason for doing research and that high-level description and what they call "conceptual ordering" are also important to the generation of knowledge.

Tools of analysis. Analysis of data began with the use of questioning. Questions were used to generate ideas or ways of looking at the data. These questions aided in triangulation of data because the stimulus for a question sometimes occurred in one data source while the answer to that question appeared in a different data source. Questions became stimuli for thinking, and they helped the analyst decide what further questions needed to be asked of participants. Additional tools of analysis included analysis of a word, phrase or sentence and analysis through comparisons (Strauss & Corbin, 1998).

Microanalysis: Coding procedures. Coding of the data for this study began with open coding, which requires that data be broken into discrete parts before being closely examined and compared. The plan was to follow with axial coding and then selective coding. However, as Strauss and Corbin (1998) suggest, the coding process is "dynamic and fluid." The researcher discovered that analysis was recursive rather than linear.

Within-case analysis. For this research, open coding was performed on each individual participant's data set. All relevant data were broken into data "bits" and were grouped by emerging themes. Eventually, these themes led to concepts and categories that were not necessarily conceptually congruent. After concepts and categories were developed, the process began again. The raw data were examined afresh, and each relevant data bit was filed under an appropriate concept. Teachers' exact words and observer descriptions of teacher behaviors were filed within each category. Open coding was completed for each participant before any comparisons were attempted across participants.

A validity panel consisting of two university professors (one at the sponsoring institution; one in another state at another university), one National Board Certified teacher, and one school principal periodically reviewed the researcher's data analysis and theme and category generation to assess whether analyses were consistent with the data.

Once the data had been filed for each participant and categories had been developed, the researcher began to draft descriptions of each individual case. The descriptions, although grounded in the data, seemed flat—unlike the classroom instruction and interactions the researcher had observed. The researcher needed a way to synthesize the data again, to pull together all the data that had been broken apart during open coding. Metaphor was suggested as a way to capture the essence of the individual participants (Merriam, 1998; Stake 1995). The categories generated during open coding, once approved by the researcher's validity panel members, were used to brainstorm professions or avocations in contexts outside education. Once a metaphor topic was determined, the researcher used electronic resources, dictionaries, the preponderance of data, and expert interviews to develop metaphors.

Cross-case analysis. During the cross-case analysis, open-coding began again. Categories were generated for the collective data set. Again, each data bit was filed appropriately. After all data were filed, the researcher looked for patterns or ways to group the categories.

For the cross-case analysis, the categories for individual participants seemed to cluster naturally into the themes, which were analyzed further after re-examining the raw data. The researcher changed the label to *domains*, and the final six cross-case synthesis domains were as follows: self, classroom, teacher/student relationships, instructional approach, professional service and leadership, and content.

The researcher reviewed the data again to derive conceptually congruent synthesis statements for each domain. Subtopics (or properties) derived from the summary ideas for each synthesis statement were also determined in

TABLE 1 Relationship Between Research Questions, Data Collection, Analysis, and Time Line

Research Question	*Data Sources*	*Analysis*	*Time Line*
What words and phrases do these teachers use to describe their practice?	Lesson transcripts Structured interviews Narrative records Preobservation questions Documented accomplishments artifacts Researcher notes	Use of questioning Analysis of words and phrases Open coding	July 1999-August 1999
What meanings do these teachers attach to these descriptions?	Structured interviews Lesson transcripts Preobservation questions Researcher notes E-mail responses	Analysis of words and phrases Axial coding	July 1999-August 1999
What concepts related to teaching practice appear for each individual participant?	Structured interviews Lesson transcripts Preobservation questions Documented accomplishments artifacts	Use of questioning Analysis of words and phrases Open coding Metaphor development	September 1999
What concepts related to teaching practice appear across participant cases?	Structured interviews Lesson transcripts Preobservation questions Researcher notes	Systematic comparison Selective coding	September 1999
How can these concepts be categorized and integrated into a "prototype that represents the central tendency" of these teachers??	Structured interviews Lesson transcripts Preobservation questions Participant response to prototype	Writing the story line Integration Selective coding	October 1999

this stage of the analysis. From these themes and categories, the researcher developed summary ideas representing syntheses across candidates in each of the themes.

Table 1 provides a summary (crosswalk) of the research questions, data sources, methods of analysis, and timeline for the study.

RESULTS/FINDINGS

The first time I observed Betty Roberts, Jay Burns, and Rebekah Hertz[1] in their classrooms and spoke to them about their teaching practice and their students, I knew that they were excellent teachers. At the time of my first contact with them, they were not yet participants in my study, but I could not help but notice some similarities among them. When I met Betty, it was in the context of the larger study. As I drove away from her school, I wondered if we would even be able to use her data because the audiotape of her lesson was worthless for transcription. She had only a brief whole-class time, and then she worked among her students as they worked in groups. The transcriptionist confirmed my worries—a few typed pages of transcript followed by a note in all caps: "LONG PERIOD OF BACKGROUND NOISE OF CLASSROOM—NOT ABLE TO UNDERSTAND AND TRANSCRIBE ANY ONE VOICE." As a researcher for the larger study, I knew that the lesson transcript was an important data source and that the research design depended on a rich transcript to answer important questions about the teacher's practice. I feared that her case might be dismissed, and I thought that losing this case would be a shame because she was a great teacher. Then, when I visited Jay and Rebekah, a similar thing happened. Each of these teachers had only a short whole-class lesson followed by a period of time in which they interacted with students. Then I thought (and panicked), "Didn't they remember we were coming? We told them we would be recording the lesson." But their instructional design seemed natural to them and to their students and did not seem contrived in any way. The students seemed very comfortable working independently and in

small groups, frequently receiving feedback from the teacher. During their lessons, I could hardly worry about the audiotapes; I was too busy trying to keep an accurate record of their movement and interaction with students. They moved often and had individual contact with every student in the classroom at least once. When I left Rebekah's school, I began to reflect on the similarities among these three teachers, not just from a data collector's point of view but also from that of a researcher and a former teacher. I wondered what (besides poor transcripts) these teachers had in common and what the poor transcripts might indicate.

During the majority of their class time, all three teachers spent time working directly with students—not making lesson plans or grading papers. The narrative record and coding demonstrate how they spent their time. All three moved among students—bending, leaning, crouching, smiling, and nodding, both enjoying their students and building relationships with them. The interactions between the teachers and their students were driven by the learning activities. They were not asking about their families or their ball games or their homework habits (I found out later that they knew about these things as well); they were asking about their learning and their thinking. They asked different questions of each student and probed each student's responses differently. It was clear that they knew these students well as individuals.

The transcriptionist's note continued to ring in my mind: "NOT ABLE TO UNDERSTAND AND TRANSCRIBE *ANY ONE VOICE*" (emphasis added.) This note indicated that there were voices in the classroom but that no single voice could be heard over the others. Often, the teacher's voice is central in classrooms, but in these classrooms, students had a shared voice. Perhaps the lack of a "good" audiotape recording was revealing more about these teachers and their classrooms than an hour-long, crystal clear recording ever could.

Another similarity I detected among these teachers was that they were "miners." They seemed to believe that students had all they needed to learn with them. The teacher's job was to "mine" it, to discover it, to draw it out for students to see it themselves—to hold it up to the light and examine it. In her preobservation questions, Betty asserted, "I must discover where each child is on his/her educational journey" and "to discover with the children is what I like best." She explained that she was not a stand-up-and-lecture kind of person and that she does not know it all. Instruction in these classrooms was not teacher centered; the focus was on students. The brief, whole-class time and the mining disposition provided initial evidence that Betty, Jay, and Rebekah had a student-centered teaching practice.

Initially, the most impressive similarity was the volume of knowledge the teachers had about their students. When asked about one student's approach to learning and how it varied, Jay responded by describing the student's family situation, social tendencies and acceptance, academic effort and motivation, physical development, and cognitive processing. He described each student we discussed with the same kind of detail. Betty and Rebekah also described students elaborately, often focusing on their affective attributes and family situations—always linking the students' characteristics and situations to their learning.

My initial observations made me anxious to examine with a critical and careful eye the data collected from these teachers. The analysis was laborious but exciting. I examined each participant individually and found themes that reflected their individual teaching practices. To examine their central tendencies in a different context, I developed metaphors for each teacher. Finally, I used the individual categories to generate categories for the collective case. I was able to group these categories into the domains of self (personal), classroom, instruction, students, profession, and content. After charting the categories in each domain for each participant, I was able to develop synthesizing statements for each domain across all three teachers. These synthesizing statements represent the central tendencies of the collective case and are as follows:

Central Tendency 1: These teachers have a sense of confidence in themselves and in their profession.

Central Tendency 2: These teachers talk about their classroom as communities of learners.

Central Tendency 3: These teachers maximize the importance of developing relationships with students.

Central Tendency 4: These teachers demonstrate a student-centered approach to instruction.

Central Tendency 5: These teachers make contributions to the teaching profession through leadership and service.

Central Tendency 6: These teachers show evidence that they are masters of their content areas.

DISCUSSION

The theoretical foundation for this study began with the premise "that teaching expertise be viewed as a category that is structured by the similarity of expert teachers to one another rather than by a set of necessary and sufficient features" (Sternberg & Horvath, 1995, p. 9). The present study involved an investigation of three individual experts; analysis of the collective case yielded six central tendencies across participants. These central tendencies provide a summary representation of the behaviors, practices, and attitudes of three expert teachers. The central tendencies derived from the present investigation are supported by previous studies of expertise in teaching.

Central Tendency 1

These teachers have a sense of confidence in themselves and in their profession. One of the insights I gained in this study was related to the participants' confidence in themselves and their profession. When I interviewed Betty, she told me about being an assistant to several teachers before she became a teacher herself. She recalled looking at the teachers and thinking, "I can do better than that." Prior to becoming a teacher, Rebekah remembered sitting in a property management office collecting rent and taking complaints. She realized that this was not what she wanted to do, and as she thought about other alternatives, she considered teaching because she felt she had a "gift" for working with children. Betty's and Rebekah's comments illustrate their confidence in themselves. Even before entering the teaching field, they felt confident that they could be effective teachers. None of the studies reported in the review of the literature for this investigation cite confidence as a function of expertise, perhaps because it seems to be an affective quality or personality trait rather than a particular behavior. Two other properties related to the first central tendency are teacher efficacy and altruistic motives. Whereas most studies of efficacy and teaching motives have been tied to teacher retention rather than teacher expertise, Campbell (1990-1991) reported a study of the adaptive strategies of outstanding teachers in professionally inadequate environments. Campbell found eight personal qualities that the teachers in the study seemed to share. Two of the eight personal qualities are related to Central Tendency 1 of the present study. Like the teachers in Campbell's study, Betty, Jay, and Rebekah exhibited a strong sense of mission and a high degree of personal and professional efficacy.

Central Tendency 2

These teachers talk about their classrooms as communities of learners. All three teachers in this study spoke explicitly and often about their classrooms as communities. Their practices also support their emphasis on community. The classrooms were characterized by clear procedures, student ownership, student responsibility, and classroom community. Berliner (1988) supports the notion of clear procedures as a function of expertise. Jay Burns's classroom procedures were evident from the moment students entered the classroom. As students entered, they took their seats and began without direction writing responses to the prompt that was on the board in their notebooks. One student distributed writing folders. When Jay took the "status of the class," students responded quickly and provided information related to the mode that they were writing and their place in the writing process. When Jay gave the direction to begin working, students moved orderly to the editing areas, the filing cabinet, and the computer stations. Although Jay did not give explicit instructions to each student, it was evident that students not only knew the procedures but also seemed to move about

the room as if it belonged to them. In many classrooms, students might be reprimanded for shuffling through teachers' filing cabinets or opening computer files. In Jay's classroom, students shared ownership of the items in the room, including certain paper and electronic files with the teacher and with each other. Core Proposition 3 of the NBPTS policy statement suggests that accomplished teachers "are responsible for managing and monitoring student learning." The systems Betty, Jay, and Rebekah have established for managing and monitoring student learning include clear procedures rather than reactive measures. These systems also allow for student ownership in decisions, including decisions about their own learning and assignments. Jay and Rebekah share ownership with students in their lesson and curriculum planning. In response to the question, "What do you think makes you a successful writing teacher?" Jay wrote, "Kids largely have control over topics and content while aiming at a rubric or criterion for the end result." Jay seems to indicate that not only is he willing to share control of the curriculum decision making with his students but also that his success is derived from sharing ownership and control. The properties of Central Tendency 2 (clear procedures, student ownership, student responsibility, and classroom community) are related to what Shulman (1987) calls general pedagogical knowledge. This category of knowledge is related to the "broad principles and strategies of classroom management and organization that appear to transcend subject matter" (p. 8). The teachers in this study exhibit pedagogical knowledge in their student-centered classroom structures.

Central Tendency 3

These teachers maximize the importance of developing relationships with students. This investigation revealed that Betty, Jay, and Rebekah spend the majority of their energies building relationships with students. These teachers develop relationships with their students by gaining knowledge about them, working side-by-side with them, and initiating contact with their families. The data from the structured interview transcripts reveal that each teacher demonstrated extensive knowledge of their individual students. An important difference among the participants was that Jay's descriptions of his students included details and diagnoses of covert processes, whereas Rebekah's and Betty's descriptions seemed more limited to observable behaviors. Another important detail related to the participants' efforts to build relationships with students is related to their proximity to them. In all three classrooms, the teacher's desk was integrated into a student area. None of the teachers had "office areas" away from the students. In addition, while students were working in these classrooms, all three teachers worked side-by-side with students. Rebekah had students sit around her on the floor for part of the lesson. In her interview, she explained that she preferred having students sit in a clump rather than a circle because they could be closer to her in a clump. Betty also moved from group to group during her lesson, bending down and working among groups at tables, on the floor, and at desks circled together. Jay was also moving about the room conferencing with students. He worked closely with them, kneeling, bending, leaning, or crouching to their seated height. In his proposal calling for a new reform in teaching, Shulman (1987) criticized studies of teacher expertise and systems of teacher evaluation because they often focus on student outcomes, particular teacher behaviors, or classroom management. My review of the literature corroborates his position. Although some studies have examined the relationships between students and their teachers, these studies are often focused on the effects of the relationships on student motivation. No studies were found that examined teacher relationships with students as a function of expertise.

Central Tendency 4

These teachers demonstrate a student-centered approach to instruction. Whereas many of the categories reflect the participants' focus on students, the properties of this central

tendency suggest that teachers take responsibility for student learning, are responsive to students' needs, assess students often and in a variety of ways, and exhibit a mastery goal orientation. The data from this study provide support to previous findings (Cushing, Sabers, & Berliner, 1992; Gonzalez & Carter, 1996) that suggest when they talk about their instruction, expert teachers talk more about their own behavior than the behavior of their students. Whereas this may seem to contradict the student-centered concept, evidence from the present study indicates that teachers take responsibility for student learning rather than exhibiting "blaming" behavior or attitudes. Betty wrote, "My challenge as a teacher is to find the giftedness and whenever possible use it to enhance learning." Not only does Betty suggest that all of her students possess gifts, but also that it is her "challenge" and responsibility to find and use them. In the same response, Betty elaborates, "I must discover where each child is on his/her educational journey and make adequate connections with his/her body of understanding in order to allow learning to be meaningful for that child." Again, Betty assumes responsibility for student learning and suggests that the "journey" may be different for every child. Her insinuation is that the teacher's approach must be specific to the individual child.

One of the ways that these teachers take responsibility for student learning is by making connections for students. Although each teacher has a different approach for making connections, all of them emphasize this as an important component of student-centered instruction. Betty helps students make connections by integrating her curriculum. She explains,

> A lot of times if you walk into my classroom, you're maybe not real sure what [subject] I'm teaching, because I try to tie things together so that they have lots of connections to make so that it does make more sense in more places. . . . So I try to find as many connections as I can and then bring those things in.

Her integration strategy is to base her instruction on science and social studies and then to add reading and writing:

> My reading is almost always a trade book that has something to do with either science or social studies. Right now, it's *Island of the Blue Dolphins*, which is other cultures, some of the animals that we would find [on our coastal trip].

Betty also suggests that she can "interlace the arts all through the curriculum." She explains that being self-contained allows her to integrate more effectively.

Although research studies on student assessment have become more numerous in recent years, most of these studies are related to student achievement rather than the types or frequency of assessment characteristics of exceptional teaching. In the design of the validity study of NBPTS certification decisions, Hattie et al. (1998) proposed that several teaching practices related to student-centered instruction are critical to expertise in teaching. Those that are supported by data from the present study include that experienced teachers (a) can anticipate, plan, and improvise; (b) are better decision makers and can identify important decisions; and (c) are more adept at monitoring and providing much feedback.

One interesting observation for me was that in all my observations, discussions, e-mails, and interviews with Betty, Jay, and Rebekah, none of them mentioned students' grades. Although this is an absence rather than a presence of evidence, it provided one indicator that their emphasis was on student learning rather than student performance. Their classes were structured around learning objectives rather than performance goals. In Jay's writing workshop, for example, the students were organizing a portfolio that would represent their growth over the course of the school year. It was not a collection of all they had done.

Central Tendency 5

These teachers make contributions to the teaching profession through leadership and service. The teachers in this study were very involved in leadership and service for their profession. Jay and Rebekah were chairpersons for their school professional development committees. Betty has been an advocate for students at the local government level. Rebekah has trav-

eled extensively, receiving and providing training to teachers in a literacy program. What is generally accepted as best practice suggests that expert teachers are involved in making their profession better (Barth, 1990). However, no research studies examining teacher expertise concentrated on teachers' involvement in the professional community. Jay and Rebekah have also been involved in working with new and aspiring teachers. Rebekah began work with a university near her school when the school of education began implementing a year-long practicum for their undergraduates. Rebekah has had three student teachers. She felt that it was her responsibility as cooperating teacher to help her student teachers "bridge the philosophy of university into practice." She wrote dialogue journals with her student teachers. She said the dialogue journals were an excellent tool for opening communication. Student teachers felt they could ask questions and express concerns openly. While Rebekah provided an important service to the university and the student teachers who worked in her classroom, she also benefited from the experience: "Having another adult in my room provided opportunities for me to evaluate my own practice. . . . I was forced to evaluate my own practice and make judgments about my curriculum ideas."

For several years now, Jay has been working with the University Fellows program, "which places undergraduate college students studying education into classrooms to work with experienced teachers for a year." Jay usually has about two of these student interns each year. Jay describes their involvement in his classroom:

> They come once a week to observe, help out where they can, and to try their hands at brief instructional experiences. The activities include simple observation at first, checking papers, responding to student writing about literature, editing essays, conferencing with student authors about what they have written, and occasionally doing a short lesson or leading a discussion. Often, the Fellows have a range of questions they want to talk about. Often, they learn by being involved in the actual process of learning with one of my students. And often they learn by planning and presenting something and then discussing it with me later.

Jay says the Fellows sometimes seem as if they have stored up a thousand questions, waiting for an opportunity to speak to a "real teacher." He says that working with the Fellows "represents an accomplishment because it is a contribution to the wider world of education, to the professional life of a future teacher, and to the lives of the students that teacher will touch."

Central Tendency 6

These teachers show evidence that they are masters of their content areas. Although mastery of content is beyond the scope of this study, data collected from the teachers did provide evidence that they are masters of their content. One of the indicators (although insufficient by itself) of their content mastery was that these teachers were continually seeking to improve their practice by participating in professional development activities and by collaborating with other professionals. This characteristic is supported by Campbell (1990-1991), who found that outstanding teachers adapted to professionally inadequate environments by continually seeking avenues to improve their teaching performance and by seeking and maintaining peer support systems that reinforced their sense of mission. Early in her teaching career, Rebekah began surrounding herself with other teachers who believed in student-centered approaches to literacy. Her collaboration with Lisa and her involvement in the voluntary literacy group are two examples of her professional collaboration. Jay Burns completed a second master's degree, knowing he would receive no financial compensation for it. He did believe, however, that a degree in critical and creative thinking would improve his teaching practice, and that seemed sufficient compensation for him.

Another indicator that these teachers are masters of their content is related to the number of professional presentations they make. All three participants have presented workshops related to curriculum and instructional methods to their peers and colleagues. That they were asked to make these presentations is an

indicator that they are considered masters in their field.

The ability of these teachers to diagnose students' learning difficulties and to propose solutions to them is another indicator of their content knowledge. Livingston and Borko (1990) report that expert teachers know their content so well that they can manipulate it and present it in a variety of ways. Shulman (1987) calls this process transformation. Transformation, according to Shulman, is related to the teacher's ability to (a) prepare for instruction by engaging in critical interpretation and analysis; (b) represent the most critical elements using analogies, metaphors, examples, demonstrations, and explanations; (c) select from an elaborate instructional repertoire an appropriate mode of teaching, organizing, managing, and arranging; and (d) adapt and tailor to students' characteristics the critical content and appropriate instructional methods, taking into consideration conceptions, preconceptions, misconceptions, difficulties, language, culture, motivations, social class, gender, age, ability, aptitude, interests, self-concepts, and attention.

Although Shulman's notion of transformation seems almost unattainable, Betty, Jay, and Rebekah, at various times, came close to this ideal. The ability to personalize instruction in such a way requires a teacher to possess tremendous content knowledge, curriculum knowledge, pedagogical content knowledge, and knowledge of learners. Such a combination approaches what Shulman calls the "intersection of content and pedagogy, . . . the capacity of a teacher to transform the content knowledge he or she possesses into forms that are pedagogically powerful and yet adaptive to the variations in ability and background presented by the students" (p. 15).

The final indicator that these teachers are masters of their content lies in the fact that they have been certified by the NBPTS. Content knowledge expertise is difficult to measure because experts cannot agree on the most important concepts in any particular area; however, NBPTS represents the most comprehensive effort to date to involve teachers and other content area specialists in developing standards and measures appropriate for examining content area knowledge and expertise (Hattie et al., 1998).

COMPARISON OF PROTOTYPE PERSPECTIVES

This research represents an earnest acceptance of the invitation by Sternberg and Horvath (1995) to examine expertise in teaching as a similarity-based category. Based on their theoretical concepts of family resemblance, central exemplars, and the prototype view, this researcher set out to explore the similarities among three accomplished teachers with diverse profiles. The results of this inquiry are in-depth cases of three unique teachers who have some similar teaching behaviors, practices, and attitudes.

Thus far, the central tendencies generated from this study have been reported individually. Although individual attention to each of the central tendencies is necessary to deepen our understanding of the collective case, the nature of the prototype view argued for in this investigation would be compromised if the central tendencies were not also considered as critical members of a holistic framework.

One way to think about the central tendencies as a whole is to consider their interrelationships. For example, it is doubtful that a teacher who lacks confidence could relinquish or share ownership of the classroom with students. Also, teachers continually seeking to improve their practice are likely to be teachers involved in school leadership and service. Just as Sternberg and Horvath (1995) acknowledge correlation of the features of their model, this researcher proposes that the central tendencies derived from this research may also be correlated so that fewer critical features might be sufficient to describe expertise in teaching.

Although the prototype view of expertise in teaching provided an initial framework for this investigation, this research did not test the constellation of features proposed by Sternberg and Horvath (1995). Rather, it was exploratory and

generative in its approach. Whereas Sternberg and Horvath use psychological research to derive the features of expert performance (knowledge, efficiency, and insight), this research used data collected from teachers in the contexts of their classrooms and profession to derive central tendencies of the collective case. Whereas Sternberg and Horvath examined mainly cognitive mechanisms and/or abilities, this study provides insight related to the practical (or tacit) knowledge of teaching practice that Shulman (1987) and Polanyi (1967) describe. Central Tendencies 5 and 6 include properties related to school and district leadership and service, professional development, collaboration with other professionals, professional presentations, and National Board Certification. These properties seem to suggest that the participants in this study have a well-developed knowledge of the social and political contexts of teaching.

Sternberg and Horvath (1995) maintain that the prototype view of teaching can "accommodate a multitude of prototypes, each based on a different sampling from the population of expert teachers" (p. 15). They propose one way to examine the expert prototype, and this research offers a second. As more studies of expertise assume a prototype approach, our understanding of expertise will increase until, eventually, we will be able to formulate a prototype of the multitude of prototypes.

NOTE

1. These pseudonyms were chosen by the participants.

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