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ABSTRACT

Examining how the researcher's personal experience shapes the research context was the object of this exploration into the parallel paths of the researcher and research subject. The subject, a preservice science teacher, was studied from her last year of an undergraduate teacher education program through her student teaching experience in an investigation of the role of experience in professional development. The researcher, a science teacher educator, saw the research as a way to learn more about designing teacher education experiences. In the course of the study, the researcher began to examine her own learning about the process of research as a parallel to the subject's learning about being a teacher. A number of parallels were found. Both entered the collaboration with experiences that influenced beliefs about their professions. Both saw themselves as professionals, and both encountered tension in thinking about their respective professions. Both felt a mismatch between their abstract thinking about the experience and the reality of their practices. As a result, both began to see their practices in a new way and to understand the complexities of their professions. Examining researcher and subject roles resulted in deeper understanding of the relationships among procedure, context, and human action. (Contains 11 references.) (SLD)

Running Head: PARALLEL PATHS

Learning from Experience: Parallel Paths of a Researcher and a Participant

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Learning from Experience: Parallel Paths of a Researcher and a Participant

In the course of becoming an educational researcher, particularly in the first few years of graduate course work, the act of research is too often presented as separate from the ongoing, personal life of the researcher. The dominant research ideology presupposes a desirability and a likelihood of achieving objectivity, thereby creating an "illusion of separation between fieldwork and the rest of our lives" (d'Amigo-Samuels in Schrijvers, 1991, p. 168). On the contrary, the contributors of this symposium are learning through their experiences as novice researchers about the integral role that our personal lives play in our research and in our professional development as researchers. By telling our stories about how our personal experiences within the research context are shaping us as researchers, we are engaging in a practice that is critical to our own learning as future researchers. This in turn, influences the research that we do. More than merely socializing into a community of practice, we are building individual identities as "researcher"-- identities within which both personal and professional experiences are embedded, from both past and present.

The idea and impetus for my contribution to this symposium arose from my recent experiences as a novice in conducting an interpretive research study in the field of teacher education. As a researcher in science teacher education, my participant's development as science teachers is just as important as my development as a researcher and science teacher educator. The ability to develop my story as a researcher and teacher educator relies on my ability to hear myself in the roles that my participants/students cast me in. I learned that identifying the various researcher roles and the issues associated with each of these roles provides an educative opportunity for the researcher to become aware of the ways in which she/he shapes, constrains, and enhances fieldwork and the relationship between participant and researcher.

Background

As part of my doctoral degree, I conducted an interpretive research study to investigate the reflective thinking of preservice elementary teachers about science teaching and learning. Part of my investigation examined, through the case of one preservice teacher named Barbara, how learning from experience plays a pivotal role in developing professional knowledge. I aimed to

uncover Barbara's beliefs about science teaching and learning; identify the tensions with which she grappled in learning to teach elementary science; understand the frames from which she identified problems of practice; and discern how her experiences played a role in framing and reframing problems of practice in the process of reflecting on her own science teaching. The longitudinal study occurred during Barbara's last year in a undergraduate elementary teacher education program, from the time she was in an elementary science methods course through her student teaching experience in a local elementary school.

My reasons for choosing to do this study extended beyond what I considered to be the obvious: (a) the study would complete the requirements necessary to get a Ph.D., and (b) this research would prepare me to enter the ranks of educational researchers, as it was my first attempt at designing and conducting a research study virtually solo. Well beyond these reasons, this research had a personal investment for me. As someone whose professional and personal identities are tied significantly to being a science teacher, I approached this endeavor with a hope that it would help prepare me in my new career as a science teacher educator. What I would learn from Barbara's experiences in developing professional knowledge would help me challenge and refine my own ideas about teaching prospective elementary science teachers. This project would give me an inside look into some of the beliefs teachers hold, how those beliefs change over time, and how teachers develop professional knowledge. I saw this research a potentially powerful tool in helping me design prospective teachers' field experiences, science methods instruction, and in general, opportunities to develop skills for reflecting on practice.

I entered my doctoral studies with a strong theoretical and practical background in quantitative research. I was enculturated in a world of science strongly influenced by a positivistic, experimental paradigm. I earned a Bachelor of Science in chemistry and worked as a chemist for many years. Even my early work in education was from a quantitative stance. In addition, I had professional experience as a physics teaching assistant and a high school physics teacher. I do not mean to suggest that all chemist or physicists are positivist. I simply acknowledge that the world of science in which I was educated adhered to a philosophy of science that operated under the basic beliefs of a positivist paradigm. I was aware, at that time, of no other way of doing science. Even after entering the field of education, my first educational research endeavor was from a traditional,

quasi-experimental perspective. I undertook a study to assess the cognitive abilities of eighth and ninth graders using a computer-based Piagetian task inventory.

It was not until I entered my doctoral program that I became aware of and began to explore alternative paradigms for conducting research, specifically educational research. Since then, I have gained a strong theoretical background in qualitative inquiry. My doctoral studies have included numerous courses on qualitative research methods, philosophy of science and education, and interpretive inquiry in science education. Yet, my practical experience was weak. By the time I designed and carried out my dissertation research, I had engaged in only one small individual interpretive research endeavor--a phenomenological study of preservice elementary teachers' perceptions of an inquiry-based physics course (Bryan, 1994).

I summarize my research experiences to create a backdrop for what became a major tension in my becoming an educational researcher. My philosophy toward educational research had undoubtedly taken a turn over the first three years of my doctoral studies, and is still evolving. Yet, the years of living within a positivist paradigm had a strong influence on my thinking about educational research and the various roles I assumed in conducting research from an alternative paradigm. My experiences with Barbara provided me with the opportunity to work through the quandaries and tensions associated with learning to become an educational researcher. I came to understand that Barbara and I were on parallel paths. As she was learning to become a teacher, I was learning to become an educational researcher/teacher educator.

Our Parallel Paths

I did not approach my dissertation research with the intention of focusing on my own professional development as a researcher. However, in trying to understand the process of Barbara's learning about teaching science, I began to inquire into my own learning about conducting research. Of course, Barbara and I learned many valuable lessons in this research, more than what are represented here. But, what became significant in my professional development as I reflected on my own practice was the *unintended* learning. What became significant was not simply recognizing the fact that the "personal" and "professional" are interrelated, but discerning how research transforms the researcher and how the researcher transforms research. What may have started out as happenstance turned into purposeful,

systematic inquiry--the type of inquiry and self-reflection I was advocating for Barbara.

This paper represents my beginning of making sense of what I consider to be "co-learning." Barbara was learning about science teaching through her interactions with me, and I was learning about conducting research through my interactions with her. We both were undoubtedly learning together about what it means to be an educator. In the next section, I draw parallels from a case analysis of Barbara's thinking about elementary science teaching and learning (Bryan,Abell, & Anderson, 1996) and my concomitant experiences conducting this case study. I describe what I have found to be the characteristics of the parallel paths of learning we took through our experiences in the collaboration, focusing on my account of personal experiences within the context of doctoral research that were influential in my evolution as educational researcher/teacher educator.

We both entered the collaboration with experiences that influenced our strongly held beliefs about our professions.

Barbara. Barbara had a great deal of experience as a science learner, as an observer of science classrooms, as an undergraduate elementary education student.

Lynn. I had a great deal of experience as a science learner, as a chemist, as a physics teacher, and as a science education graduate student.

Parallel. From these experiences, we each formed ideas about our respective professions and how we saw ourselves as future professionals. However, each of us had a paucity of experience in our respective professions--Barbara had a paucity of experience as an elementary science teacher, and I had a paucity of experience as a qualitative researcher. Our common experience within the research project would build the professional facet of our repertoires of experience.

We both had visions of ourselves as professionals.

Barbara. Barbara had a definite vision of herself as a science teacher. This vision included her ideas about how she believed children learned best, what she valued as an elementary educator, what she believed about the role of an elementary teacher of science:

> As an elementary science teacher, I see myself working with children and trying to create a rich environment by providing students with manipulatives and encouraging them to experiment. I want an active science class in which students explore their interests. As an educator, I also want to be there to assist and advise my students, but in no way do I want to guide their thoughts to a specific conclusion. I believe that students throughout their experiments and mistakes, draw their own conclusions. I feel that my elementary and high school experiences had the greatest influence on me and my vision. These were fun experiences for me, and I got the chance to do things by myself. I believe children live and learn through their experiences with the world. (Written Reflection, 1/18/95)

Lynn. Just as Barbara approached her profession with a vision of herself as a teacher of elementary science, I approached the research with an explicated vision of myself as a researcher. My vision included my ideas about how I would conduct the research and the role I would play:

> I will negotiate with the participant the research relationship throughout this phase of the study. I anticipate that while observing the student teacher's science lessons and initiating conversations with the student teacher about these lessons, the student teacher will be compelled to solicit my evaluation of the lesson. Hence, I will maintain the stance of empathic neutrality (Patton, 1990): "Empathy communicates interest in and caring about people, while neutrality means being nonjudgmental about what people say and do during data collection" (p. 58). (Bryan, 1995, p. 12)

Parallel. In each of our cases, the visions we held became instruments for reflecting on our own practice. Although I did not enter into this research project with the intention of reflecting on my practice as a researcher, I had purposefully asked Barbara throughout the project to talk about her vision of herself as a teacher or elementary science as a tool for her to make explicit her beliefs about science teaching and learning. What I came to realize a few weeks into our collaboration was that my vision of myself as a researcher, as explicated in my research proposal, became a tool for me to articulate my own beliefs about conducting research. Making explicit our beliefs about our professional lives provided each of us with a foundation from which we could analyze our immediate experiences. Barbara's vision became a reference point for analyzing her science

teaching practices. My vision became a reference point from which I analyzed how I was conducting qualitative research.

We both encountered, early in the collaboration, tension about our thinking about our respective professions.

These tensions arose when when we compared what we thought would happen in practice to what actually happened in practice. Though we individually encountered many simultaneous tensions in our thinking and these tensions were often integrally related to each other, we each seemed to have one major issue in our professional lives on which we expended our energy. Barbara's tension quickly became the focus of our conversations.

Barbara. Barbara encountered tensions in her thinking about teaching science teaching. Specifically, she identified one major issue in her teaching with which she was grappling. On one hand, Barbara wanted to teach in a manner consistent with her vision, i.e., "so that all students can feel like they learn from their own exploration" (Interview, 5/2/95). Yet, her experience in the field provided evidence that students do not always learn from exploration. She wanted to be a guide and facilitator of her students' learning, yet was unsure of what to do when students did not understand the concept she was teaching. The tension between her vision that all students would understand the right answer before moving on and her practice in which some students did not come to understand became a central tension in her thinking about science teaching and learning.

Lynn. As a result of a professional and personal relationship that evolved between myself and Barbara in this collaboration and my desire to frame this relationship within a research context, I felt both tensions and ambiguities with the different roles I saw myself playing and that I felt Barbara saw me playing. On one hand, the personal engagement in interpretive inquiry permitted me to gain an in-depth understanding of what I was investigating with Barbara, facilitated a high level of trust between the two of us, and provided both of us with an opportunity to further our own professional development. On the other hand, my personal engagement often felt incompatible with my perceived professional obligations in conducting the study and raised questions about bias, distortion, and credibility of the research findings. Furthermore, I found that conducting research in teacher education provoked another dilemma-- when was it appropriate to

take off the "data collector/interviewer" mask and don the "teacher educator" mask? I often faced a moral obligation to play the role of a teacher educator, yet questioned the influence that this role would have on my relationship with Barbara and on data collection. As a researcher, I wanted to by systematic, thorough, and unobtrusive. As a teacher educator, I wanted to be responsive and facilitative. I felt I had a responsibility to help her move beyond her current understanding of science teaching and learning.

Parallel. In each of our cases, Barbara and I were grappling with tensions related to roles. Barbara's tension was tied to her role as a science teacher and the issue of when to move on in science instruction. I found that during the evolution of my collaborative relationship with Barbara, I was constantly negotiating two major roles (researcher, science teacher educator) and the responsibilities associated with each of those roles.

We both encountered recurring perturbations to our respective visions via experiences in the field. The mismatch between the abstraction of our thinking and the reality of our practices created the perturbations.

Barbara. Barbara encountered the perturbations as a novice teacher learning to teach. From the beginning of the science methods course through the duration of student teaching, Barbara talked about the frustration she felt when her students did not understand a scientific concept that she was teaching using the very methods of teaching she advocated. She coped with the tension by finding ways to blame the students. The students were "acting like first graders; they had a long weekend so they forgot what they had learned; the words in her questions were "too big". She sought solutions to her dilemma by going over the material numerous times, "rephrasing the questions," and simply telling them the answer. However, she recognized that her solutions did not resolve her tension. She recognized that solutions did not resonate with the teaching methods that she advocated in her vision. The recurring perturbations became a fight for her:

> One of the things I am fighting with really hard right now is I am always one of those people that says, "I'll let the kids experiment and let them do this and do that." And, it's really hard for me at times, because I get really frustrated when they are not finding what

> I'd like them to find or see what I'd like them to see. That is very hard for me, and I didn't think it would be, and it is. I am finding inconsistencies within myself... That is one of the things I have really been trying to work on. (Interview, 9/12/95)

Lynn. I encountered perturbations as a novice researcher learning to conduct interpretive inquiry. I saw the roles that I was playing and the roles that Barbara reacted to as disparate roles, not connected to each other, but incongruous with one another. I was struggling to play out my vision of empathetic neutrality, while I sensed that Barbara was casting me as science teacher educator/science teacher expert. She understandably wanted feedback from me about her science teaching and advice on how to handle specific classroom situations. My vision of my role as researcher (from a stance of empathetic neutrality) conflicted with the obligation I felt as a science teacher educator to enable Barbara to learn from her experiences within the study.

The seed for this perturbation was planted before the study even began. Going into this study, I knew that I wanted to do more than simply add to a knowledge base on teacher thinking. I was hoping to use the research while allowing Barbara to use the research to become a student of her teaching. Yet, I did not acknowledge my role as a science teacher educator as an intentional role of the researcher. The science teacher educator role did not fit my preconceptions about the research relationship that Barbara and I would build (remember, these preconceptions were largely influenced by many years of conducting research from a positivist paradigm!). I was hoping that Barbara's learning would be a by-product of my role as an empathetically neutral researcher. After conducting several interviews with Barbara, I felt a recurring obligation and a responsibility as a science teacher educator to coach Barbara through some difficult tensions she was having with her teaching:

> There are two things that stick out in my mind right now. One is the need to coach more--how to reflect about your practice or someone else's practice. And what I am referring to here is in the first interview--Barbara not recognizing the inconsistencies in teaching. Barbara was likening Mrs. Planet's methods to conceptual change teaching, when in fact that was not what Mrs. Planet was doing. The second thing is helping Barbara realize some of the inconsistencies in her own thinking, that what she professes to believe does

> not mesh with some of her practices nor some of her suggestions for addressing problems of practice. (Field Notes, 9/6/95)

I certainly did not know all of the answers for Barbara. But as a science teacher educator with years of experience as a classroom teacher, I was able to recognize that what Barbara professed about science teaching did not always play out in action. Yet, if I was to remain "nonjudgmental about what people say and do during data collection" (Patton, 1990, p. 58), how was I to coach Barbara to think critically about her teaching? I found myself in a dilemma parallel to Barbara's. I was professing one thing, but found myself practicing something quite different!

My struggle with this tension played out in practice as I became apologetic for allowing the role of the teacher educator to "seep in." I did not want Barbara second-guessing why I was asking a particular question, because if she did so, she might not tell me her honest thoughts but rather what she thought I wanted to hear.

> Some of these questions aren't going to be easy, in terms of, I guess if I see something that I feel is inconsistent with your beliefs, I might bring it up, and it may not be easy to talk about. On the other hand, I may see some things that are really consistent with what you believe in, and I will want to talk about those, and that may not be easy to talk about either. Because a lot of times when talking about your own assumptions, beliefs, and values, it is hard to identify those things. So, just because I pick something out does not necessarily mean I am picking on it, but just that I notice a situation, make observations, and recount those observations and want you to make sense of them for me. (Interview, 9/12/95)

I should reassure her that there was no need to read into questions. She should answer based on what she thought, not what I wanted. My intentions were that if I was going to have any influence, then I should minimize what influence I had.

Parallel. Having to constantly confront her students' lack of understanding a concept forced Barbara into situations that confused and perplexed her. Constantly confronting what I perceived to be a conflict of the purpose of each of the roles I played became a source of frustration for me. However, these frustrating experiences afforded each of us the opportunity to think about plausible solutions, try them out, and recognize the outcomes and consequences.

We both began seeing our practice in a new way. From our experiences we learned the complexities of our professions. We no longer viewed practice in terms of black and white, but in shades of gray.

Barbara: Barbara recognized that solutions she was implementing in her practice were not consistent with her beliefs about how she should teach science in an elementary classroom. Having to constantly confront the mismatch between her vision of teaching elementary science and her actual practice and experience in the classroom, Barbara eventually began to look at her practice in a new way. Instead of blaming her students, she began to deconstruct what the activity was asking her students to do. Barbara approached the situation that was creating tension by thinking in terms of what the activity required for conceptual understanding to occur. Thinking in terms of the developmental abilities of children and implications for appropriate science activities was the first step in considering alternative solutions to the problem--solutions that would be more consistent with her beliefs.

Lynn: The nagging tension I confronted throughout this project was that I saw my role as a researcher in conflict with my role as a teacher educator. An example of how of this tension was played out again and again is illustrated in my attempt to collect data via a written journal. I saw the journal as a research tool in which Barbara could detail her thinking about science teaching and learning. I did not want Barbara to perceive me as a teacher educator for fear that her journal writing would become like an assignment of class and her answers to my questions in interviews would be in the same vein. I was very careful to suggest open-ended questions she could ponder for her written journal reflections. I encouraged her to write her stream of consciousness, picking up her journal and writing whenever she felt the urge. However, Barbara did perceive the journal as an assignment. Because we arranged in advance when we would get together to interview, she knew when I would want to take a look at her journal. Inevitably, Barbara would write a passage the night before, enumerating the questions that I asked her to ponder, writing a brief paragraph for each one. Her responses indicated to me that she perceived me in the role of teacher educator and completing her journal like an assignment for the methods class. I persisted with using a journal because I perceived the journal as a way of collecting data in which I would have minimal influence. I could ask her a few questions to think about, but it was up to Barbara to focus her

journal writing on issues in her teaching, her observations about her own science teaching, her beliefs about science teaching and how those beliefs were changing with experience.

My experiences in persisting with the journal ultimately served a pivotal purpose in the way I was looking at my roles as a researcher. I recognized that I needed to acknowledge the roles that Barbara cast me in. She knew me a a teacher educator as well as a researcher. She knew that I was a former high school teacher and had worked for several years with prospective teachers. She could not ignore that knowledge she had of me. Furthermore, I could no longer ignore that she was going to react to what she knew about me. Instead of keeping the role of the researcher and the role of the teacher educator separate and seeing them as conflicting, I began to see the roles along a continuum. *All* of our interactions were going to include both of these roles. I recognized that there would be times when the teacher educator role may take precedence over the researcher role, but both were integrally informing the other. I could not separate them. I was trying to use the journal to accomplish that separation, though. The journal came to represent the conflict I was perceiving.

Once I was able to view my roles as integrated rather than separate and conflicting, I could more clearly see alternative ways to collect data that would be meaningful to my new integrated role in the study. What I once considered formal interviews, now began to take the form of conversation or dialogue. The questions I began to asked her were constructed with the intention of helping Barbara clarify her beliefs, identify issues about science teaching and learning, think about alternatives and solutions to the tensions she faced, and examine consequences of those alternatives and solutions. I began to see that the questions I asked were a legitimate part of a "blended" researcher/teacher educator agenda.

Parallel. Adopting this new way of looking at teaching elementary science was not an easy process for Barbara, nor was adopting a new way of looking at my roles in the research an easy process for me. Many weeks of reflecting on her science teaching through extensive discussions did not immediately lead to a resolution of the tension between her vision of teaching science and the actual practice of teaching science. Likewise, many perturbing encounters with the tension in my thinking did not immediately lead to a resolution between my vision of conducting interpretive research and the reality of conducting interpretive research. Ultimately, however, both of us

created new perspectives from which to view our practices. These perspectives challenged each of us to abandon a black-and-white view of practice and consider the complexities of practice.

Discussion: The Research-Researcher Dialectic

The tension I experienced was not unlike what other teacher/researchers debate--whether conducting research while teaching students in the classroom is compatible or in conflict. This debate was most recently addressed in several issues of *Educational Researcher* (see Baumann, 1996; Wilson, 1995; Wong, 1995a; Wong, 1995b). Like Wong (1995a), I initially felt that my role as a researcher was to stand back, observe, and have as little impact on Barbara's interview conversations as possible. On the other hand, I felt an obligation as a science teacher educator to facilitate Barbara's thinking and learning about science teaching, despite the fact that I might alter the what I was investigating. In my particular case, I was confronted with my growing realization that I was not taking a neutral, objective, a-political stance toward my research. The tension arose because my abstraction of the research process was rooted in the somewhat "mythical" dominant ideology in social science that presupposes (a) a desirability and the possibility that there is an isomorphism between the data of study and reality; (b) inquiry is value-free, and (c) when the appropriate methodology is employed, an adequate distance between observer and observed can be maintained. On the other hand, I was confronted with the reality of my experiences in which I was becoming cognizant that the development of my own theoretical ideas and my own personal experiences were in fact significantly interrelated and significantly influencing the types of questions I asked in my dialogues with Barbara throughout the data collection and analysis of the study. My engagement in the field was becoming a part of my changing personal identity and my reflections. Once I accepted that I was transforming the research as the research was transforming me, I was able to view my roles as integrated rather than separate and conflicting and saw more clearly productive ways to conduct the research.

Admittedly our paths were not perfectly parallel. In Barbara's learning to become a teacher, I played an active, collaborative role in helping her resolve the tensions in her thinking. She recognized and acknowledged my role in this capacity. However, in learning to become a researcher, I did not actively engage Barbara's participation in my process of resolving the tension between my vision of myself as a researcher and the reality of being a researcher/teacher educator.

I did not share with her what I was going through, what I was thinking, the issues in my research with which I was grappling, my changing conceptions of research as a result of my interactions with her. As a result, I missed out on a potentially rich opportunity to learn with her. Yet, what I missed in no way diminished the powerful lessons that I did learn.

Barbara helped me learn that becoming a teacher is similar to becoming a researcher/teacher educator. First, the propositional knowledge that each of us gained in our coursework, readings, and lectures cannot be translated directly into practice. Second, our development of professional knowledge was most fruitful in conjunction with experience rather than before experience. Finally, both researching and teaching, when approached reflectively and reflexively, embody continual "becoming" and life-long learning.

In their reflections on being a teacher educator and a researcher, Ardra Cole and Gary Knowles (1995) stated:

> There is considerable value in turning the research camera inward to better understand some of the life and career history influences we bring to our professional practices, and how these influences intersect and interact with contemporary institutional and societal realities. (p. 130)

As Cole and Knowles suggested, identifying, analyzing, and revealing the masks we wear in our research endeavors and discussing publicly the issues associated with them serve several purposes. First, such dialogue illustrates the highly personal experience in which we engage when conducting interpretive inquiry and emphasizes the intersection between procedure, context, and human action. It also helps us make sense of our contributions to the field of educational research. Examining our researcher roles and the issues associated with them raises our consciousness about the influence we have on our work, the assumptions that we might otherwise take for granted in conducting interpretive studies, and the implications these issues have for the quality of our research. Finally, this dialogue allows us to think reflexively about our work and possibly extend the boundaries of our thinking about conducting and communicating interpretive inquiry.

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