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Reflections at 35,000 Feet:
An Open Letter to the ACCLAIM Doctoral Cohort

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ACCLAIM's mission is the cultivation of *indigenous leadership capacity* for the improvement of school mathematics in rural places.

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I know I am not alone in believing that the 2003 ACCLAIM Research Symposium was quite a success. The formal presentations on Monday were intriguing and well done, and they were nicely complemented by the discussions that followed, which brought many additional issues and perspectives to the surface.

Selfishly, I particularly enjoyed the opportunity to serve as one of your mentors in the Tuesday morning session as well as to participate in the larger discussion that followed this session. But as I was returning to Maine (hence the title of this missive), I found myself contemplating how I *wished* I had made the points I was attempting—and others I hadn't attempted—in my brief comments following the mentoring session. Because I put my thoughts to paper better than I can deliver them orally, I resolved to submit my reflections to you in written form—if not for your personal benefit, at least for my peace of mind!

Some of what follows differs little from what I said Tuesday in the larger discussion; one or two comments go a bit beyond. In all cases, however, my reflections derive from the wonderful exchange that Sigrid Wagner and I had with the four doctoral students in our group: Deborah King, Sue Nichols, Craig Green, and Crystal Rice These reflections pertain to issues concerning the conceptualization and conduct of doctoral research that aspires to bridge *mathematics education* and *rural*.

Scope

The scope of a study is a lot like porridge: it can be too broad, too narrow, or just right. Go for the *just right* scope! Of course, this is much easier for me to say than it is for you to pull off. Nevertheless, the common error for doctoral students is to attempt a study that is too broad, not one that is too narrow. I have found that scope tends to be just right if you do your best to strike a balance between (a) asking a question that is doable given the practical constraints you face and (b) asking a question that promises to make a palpable contribution to the literature. If you emphasize doability over contribution, you easily may end up with an excessively narrow, possibly trivial, research question. And an emphasis on contribution over doability just as easily may lead to a research question of impracticable proportions.

Remember, a study doesn't have to be Nobel-prize worthy (not that education has one) in order to make a contribution. *Small* contributions—doable studies—can be *important* contributions. Don't go for the home-run; it's an accomplishment just to get on base. Some of my favorite studies ask simple, clean questions that may take us only a step or two further in what we know. The point is that they *do* take us further in what we know. When thinking of a research question, the simple self-test is this: Can you answer the *So what?* query? That is, what is the projected import of your study? What might your results tell us (or at least suggest to us), and how does this go beyond what we already know? Why, and to whom, does this matter?

"Heart and mind"

The instructions for the two-page proposal that you prepared for the symposium contained this statement: "We're not even asking that you seriously propose a dissertation topic close to your heart and mind." That may have been reasonable advice for this particular exercise, but do not generalize it to your dissertation research! Among the most important

attributes of a research question is that the question profoundly interests you. Without that, it will be difficult to persevere. And if nothing else, the dissertation is a demonstration of perseverence.

Design

Question/design match. Your research design must match the question you are asking. A mismatch can be fairly obvious. For example, if you are interested in how parents' mathematical attitudes are related to those of their children, it is important to collect data on both parents and their children! But sometimes a mismatch is less obvious, as when you announce your intention to examine how one variable "affects" or "determines" another, yet you propose a design that exercises neither experimental nor statistical control.

Your design dictates what you are able to deliver by way of making a contribution to the literature. A question/design mismatch puts you in the unenviable position of having promised more than you can deliver.

Fidelity of treatment. A problem that arose in our group was the design in which the researcher delivers each of two instructional treatments. This is problematic because it raises questions about fidelity of treatment. For example, if you deliver two methods for teaching a mathematical algorithm—Method A and Method B—and you enter this study believing that Method A is superior, Method B likely will not get a fair shake. A different teacher for each method could ameliorate that problem (particularly if each is teaching according to his or her preferred method), but then we introduce another problem: confounding teacher with treatment. For example, if the results show that Method A students have more positive outcomes than Method B students, is this because Method A is better or because the teacher of Method A

simply is a better teacher? When teacher and treatment are confounded, there simply is no way to tell. Although this problem is most easily illustrated with relatively quantitative designs, it can surface just as easily in relatively qualitative designs.

If you want to compare methods of instruction, my advice is to have multiple teachers for each method. If for whatever reason you are wedded to either scenario in the preceding paragraph, then it will be your obligation to ensure—by design—that each method is delivered with comparable fidelity. Otherwise, you will have no basis for attributing an obtained difference in outcomes to method per se.

Unit of analysis. Imagine that the study above involved two classrooms: one class of 20 students taught by a Method A teacher and another class of 20 students taught by a Method B teacher. If you were to do a statistical analysis of these data, how large would you say your sample is? If you answer "40," then you may not have thought through the unit-of-analysis problem. In fact, many veteran researchers would argue that $n = 2$ in this study, believing that the appropriate unit of the analysis is the *classroom* (the level at which the treatment is delivered), not the *student*. To treat the student as the unit of analysis ($n = 40$) is to regard each of the 20 students in a classroom as independent observations. This is questionable insofar as these 20 students are in the *same* classroom experiencing the *same* instructional treatment from the *same* teacher. This is yet another reason why multiple teachers per instructional treatment is a good strategy for research of this kind.

Related literature

Read broadly. For example, each proposal (across all three groups) involved in one way or another the discipline of educational psychology. Yet only one or two proposals cited

anything rooted in this discipline. Mathematics and mathematics education are important, of course, but so is foundational research on cognition and motivation. The literature in rural sociology also is central, particularly given your putative commitment to place. And insofar as ACCLAIM is devoted to the union of mathematics and rural education, I encourage you to draw on *Journal of Research in Rural Education*. (Only one proposal cited an article appearing in *JRRE*.)

I acknowledge that these two-page proposals are not necessarily indicative of how you will approach the conceptualization of your actual dissertation. Nevertheless, do not underestimate the importance of the extant literature for informing your research question and, ultimately, for influencing the import of your investigation.

Putting rural in rural education research

Some of you—all of you, I hope—will conduct doctoral research that informs rural education. If you do, the important question for you is this: *Are you investigating a rural phenomenon, or a phenomenon that is observed incidentally in a rural setting?* Far too often, rural education research is merely education research conducted in rural settings. Just because a cat has kittens in an oven doesn't make them muffins. Similarly, just because a phenomenon surfaces in a rural setting doesn't make it a *rural* phenomenon.

We are not entitled to draw conclusions about rural education merely because our study is situated in a rural context. Rather, researchers must provide compelling warrants for drawing conclusions regarding rural phenomena. In some cases, the phenomenon is inherently rural—rural (almost) by definition, one might say—in which case the researcher's task is to explicate this to the reader. An example that comes to mind is Maureen Porter's delightful analysis of the

county fair as a forum for cultural transmission from one generation to the next.[1] The county fair, at least as Porter describes it, is incontrovertibly a rural institution. While there doubtless are analogous institutions in nonrural locales, the county fair arguably is unique to rural communities. Consequently, the county fair as a context for intergenerational learning arguably is a rural phenomenon, and Porter's study helps us think in new ways about rural education. Other examples that invoke inherently rural phenomena (or close to it) are K-12 schools, island schools, one-room schools, multi-grade classrooms, and long bus rides.

But I believe that the "inherently rural" phenomenon is by far the exception to the rule in rural education research. We typically must go further to provide sufficient warrants for our conclusions regarding rurality. My position is that researchers—of all methodological persuasions—must offer stronger and more vivid contrasts between rural and nonrural contexts in order to establish the rurality of the phenomena they putatively uncover.

Providing warrants by design. One design strategy for addressing this challenge is simply to include a nonrural comparison group. For quantitative designs, this would require a rurality variable of some kind, meaningfully defined. For qualitative designs, one could include at least two field sites—one decidedly rural, the other not—and make comparisons between the sites in terms of themes that emerge from the data.

Another design strategy allows for an entirely rural sample but incorporates a comparison of conditions. For example, while listening to Ron Eglash's keynote address Monday morning, I was thinking of different ways to test the tacit proposition that place-sensitive software involving, say, Native American bead patterns facilitates mathematical knowledge and reasoning among Native American students. That is, does the place-sensitive nature of this software really

[1] Porter, M. K. (1995). The Bauer County Fair: Community celebration as context for youth experiences of learning and belonging. *Journal of Research in Rural Education, 11*, 139-156.

matter, or, rather, would comparable place-neutral software—involving equally attractive and intriguing patterns, but not demonstrably tied to local culture—produce the same outcomes? (For the sake of argument, I'm treating place as *rural* place.) This question easily can be investigated by randomly assigning these Native American kids to either place-sensitive or place-neutral software and then comparing outcomes across the two groups. An alternative design, provided that certain assumptions are met, is to have all kids use both versions of the software (with place-sensitive occurring first for half of the students, place-neutral first for the other half).

Providing warrants by rhetoric. There also is a rhetorical strategy for establishing rurality. By this I mean the systematic comparison of one's findings from a rural context with what has been reported by researchers pursuing related questions in nonrural settings. A rhetorical strategy serves an important compensatory function when a comparison group is impractical, not available to the researcher, or somehow philosophically incompatible with one's methodological code of conduct. Although I find the design strategy more powerful in principle, it seems to me that in the absence of a design strategy, it is the *rural* education researcher's obligation to contrast results obtained in rural settings with those obtained by others in a nonrural context. Otherwise, we relegate rural to the incidental.

Language

Do not underestimate the value of peppering your dissertation proposal with highfalutin language, particularly if you fear that the substance of your thinking falls a bit short of the mark. You easily can dress up an argument by using any of the following terms, alone or in combination: gemeinschaft (of course), heuristic, ontological, praxis, deconstruct, paradigm,

construct (the noun), hegemony, problematize, constructivist, and, of course, postmodern (postpositivism works well, too).[2] But proceed cautiously! For example, if you would be caught flatfooted by the query, "What precisely do you mean by *praxis* in this paragraph? Don't you simply mean *action* or *practice?*" then it is best to avoid highfalutin terms.

You doubtless understand my playful point here, which is to avoid highfalutin language. You simply don't need it. The perceived substance of your argument should not depend on the use of jargon and low-frequency words.

A final note

As I said above, the dissertation in large part is a demonstration of perseverence. If you expect this, you will experience fewer surprises and less frustration. Plan on writing *multiple* drafts of your dissertation proposal, and don't be surprised (or too hard on yourself) if you find that the first several drafts were all for naught, or that a draft you thought was pretty good is roundly criticized by readers. This is par for the course. Crafting a clear and defensible research question is a messy process and, for most mortals, it involves false starts, setbacks, and slow progress. But don't get discouraged, for once your dissertation proposal is approved (and in all likelihood it will be), you will experience an immense sense of relief, you will see the proverbial light at the end of the tunnel, and you will have a comforting roadmap for the journey ahead. Good luck!

[2] For more tips on using language to impress and obfuscate, the following resource is invaluable: Bowler, P. (1985). *The Superior Person's Book of Words*. Boston: David R. Godine.