The Promise and Perils of Alternative Forms of Data Representation

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The Promise and Perils of Alternative Forms of Data Representation

ELLIO T W. EISNER

This article addresses the potential strengths and weaknesses of alternative forms of data representation. As educational researchers become increasingly interested in the relationship between form of representation and form of understanding, new representational forms are being used to convey to "readers" what has been learned. These explorations are rooted in an expanding conception of the nature of knowledge and the relationship between what one knows and how it is represented. While new forms of representation have their potential virtues, they also have their limitations. The uses and limitations of these new methods are addressed in what follows.

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They said, "We are afraid."
"Come to the edge," he said.
They came.
He pushed them
And they flew.
—Apollinaire

The theme of this article—alternative forms of data representation—resides on the cutting edge of inquiry in research methodology. One of the basic questions scholars are now raising is how we perform the magical feat of transforming the contents of our consciousness into a public form that others can understand. The assumption that the languages of social science—propositional language and number—are the exclusive agents of meaning is becoming increasingly problematic, and as a result, we are exploring the potential of other forms of representation for illuminating the educational worlds we wish to understand.

The motives for such concerns emanate from the growing discontent with traditional conceptions of knowledge, conceptions that for many—especially younger scholars—have been regarded on one hand as too restrictive to encompass and convey all that is important about education and on the other hand as preserving the status quo and the power of the methodologically enfranchised (Eisner, 1988). Indeed, the form this article takes, originally prepared for an address, has been retained because I believe form and content cannot be disaggregated: How one writes shapes what one says. I want to retain the spoken quality of what I have to say.

The desire to open up new ways of seeing and saying has been motivated by both epistemological and political impulses. As a result of these impulses, we find ourselves on the edge of methodological inquiry. Edges can be treacherous, but they can also be exciting. And, in any case, edges are not a bad location if one is a university professor—especially one with tenure! Universities, after all, should be places with big erasers on their pencils, or if that image is antediluvian, they should be places with big delete keys! Yet, it's not a bad idea to be aware of the potential problems and pitfalls of new ideas and practices as well as their promise. My aim here is to explore both the promise and the perils of alternative forms of data representation. I also wish to put our interests in this matter in an historical context, and I want to make some projections as to where I hope our interests might lead.

First, it is right to acknowledge that, methodologically speaking, the field of educational research has come a long way since the late 1960s and the early 1970s. Those who were around then will remember that it was in 1966 that the Campbell and Stanley (1966) monograph on quasi-experimental and experimental research design was published. For a time, the Campbell and Stanley monograph represented a methodological ideal for educational research. If you could, the true experiment was the model to use. In the 1960s, qualitative research in the field of education had little saliency, though there were some exceptions. Interestingly, many of the most influential exceptions came from those who worked in a quantitative tradition. Lee Cronbach (1975) and Donald Campbell (19781, two traditional researchers, raised fundamental questions about time-honored assumptions in doing research. Egon Guba (1978), another former quantitative researcher, was beginning to explore what he called "naturalistic methods." Philip Jackson (1968), someone who studied with Irving Lorge, a psychometrician at Teachers College, explored life in classrooms while Harry Wolcott (1973) studied the man [sic] in the principal's office.

Today the picture looks quite different. Since the late eighties, qualitative research as a category in AERA programs has been the fifth or sixth largest classification for papers presented at its annual meetings. At Stanford, the

ELLIO T W. EISNER is a professor of education and art at Stanford University, College of Education, Stanford, CA 94305-3096. His major scholarly interests focus on the functions of forms of representation in cognition, especially in the arts and in the conduct of educational research. These interests are reflected in his books, Cognition and Curriculum Reconsidered (1994) and The Enlightened Eye (1991).
institution in which I work, what was once viewed with skepticism among some faculty and dismay among others, methodologically speaking, is now the favored approach for doing educational research among doctoral students. But these changes did not come easily.

In the early seventies, when I turned to the arts and humanities as sources of research method and my students and I started to do research using educational connoisseurship and educational criticism, we were expected by most of my colleagues to write extensive justifications for so personal an approach. Times have changed—although I must confess there are still some faculty holdouts. The difference is that while in earlier times I could not ignore them, today I can. The climate has changed.

In 1975, I was asked to give an invited address to Division B of AERA (Eisner, 1977). In that address, I closed my remarks by expressing the hope that someday there would be journals in education devoted to the publication of qualitative studies, that programs in universities would prepare researchers to do such research, and that conferences devoted to its examination would be available. Today, over 20 years later, the field has two journals devoted to qualitative research1 and many more that publish such research. As for training programs and conferences, we now have both. In less than a quarter of a century, the field has come a long way.

But my aim is neither to praise the achievements of qualitative researchers nor to talk about the changing status of qualitative research. My aim is to provide context. One part of that context is the fact that until quite recently discussions of qualitative research methods almost always were reduced to doing ethnography; to do qualitative research for many in our field was to do ethnography. It is not difficult to understand why ethnography was a safe haven for researchers. Ethnography is a subset of cultural anthropology, and cultural anthropology is a division of the social sciences. It is, one might say, a member of the same church. In addition, ethnography, some people believed, had a teachable and learnable “method,” it had a technical language, and most important, it had scholarly standards. It was a recognized discipline.

What became clear—slowly, to be sure—was that qualitative research methods were not the monopoly of ethnographers. Qualitative methods were used by sociologists (Goffman, 1962), clinical psychologists (Sullivan, 1953), historians (Tuchman, 1962), and writers of all kinds (Capote, 1965). Indeed, the arts and humanities were bastions of qualitative research, and for artists of all persuasions, qualitative inquiry was at the heart of their enterprise. Over time, the concept of research itself was broadened, and science was recognized as one among several of its species.

The emergence of this insight—namely, that research did not belong to science alone—represents for me a defining moment. Once it became clear that qualitative research was more than a species of a social science applied to education, the door was opened to questions about what constitutes legitimate forms of inquiry in education and of those forms of inquiry, what should count as research (Eisner et al., 1996). This question—what should count as research—leads to a very deep agenda. It is also an agenda with high stakes for it pertains to matters of legitimacy, authority, and ultimately to who possesses the power to publish and promote. Issues of epistemology have political ramifications as well as intellectual ones (Eisner, 1988). Yet from a purely intellectual perspective, the exploration of alternative forms of data representation is simply a symptom of a fertile imagination seeking to discover its limits.

The title of this article signals both an interest in the possibilities of representation and, at the same time, a recognition of the limits of the forms of representation that are conventionally employed. When we talk about alternative forms of data representation, I assume we mean forms whose limits differ from those imposed by propositional discourse and number. In other words, we are exploring forms of communication that we do not normally use to represent what we have learned about the educational world. How do we make such representations? What forms can they take?

If we reflect on the culture at large and ask how we convey what we know, a large number of forms for doing so come immediately to mind. First, we tell stories. Stories have particular features. Stories instruct, they reveal, they inform in special ways. We also use pictures. Pictures depict. They do many things; among the most important is the obvious: They show us what things, places, and people look like.

People have also been known to make diagrams that display relationships that otherwise would be impossible to grasp. And, of course, people make maps to stand for much more than what we are able to see directly. In fact, we have all kinds of maps, from Mercator projections to globes, to displays of population density, climate, and terrain, all designed to represent what we think we know (Tufte, 1997). In addition to maps, we have theater that, after all, is a frame for expanding our awareness of those forms of life that are best portrayed within the proscenium arch. In addition to stories, pictures, diagrams, maps, and theater, we use demonstrations, often unencumbered by language, to show to others how something is done. And, perhaps above all, we have poetry, that linguistic achievement whose meanings are paradoxically non-linguistic: Poetry was invented to say what words can never say. Poetry transcends the limits of language and evokes what cannot be articulated.

What is clear is that the forms we use to inform, the forms that display what we make of what we have chosen to call “data” are as old as the hills; they may be new in the context of educational research, but they have been around forever. In the educational research community, the full array of such forms has been limited. Not all forms of data representation have been considered legitimate in the context of research. That’s why the conversation about these matters is so important. That conversation is not only about the use, say, of film as a form of data display; at a more fundamental level, it is about what it means to do research.

There is an intimate relationship between our conception of what the products of research are to look like and the way we go about doing research. What we think it means to do research has to do with our conception of meaning, our view of cognition, and our beliefs about the forms of consciousness that we are willing to say advance human understanding—an aim, I take it, that defines the primary mission of research. What succeeds in deepening meaning, expanding awareness, and enlarging understanding is, in
the end, a community decision. Conversation and publication are, in part, aimed at testing ideas in that community.

There are two other points I wish to make about alternative forms of data representation. One is that when AERA decided to encourage its members to propose experimental sessions by inventing new ways to present the results of their research at its annual meeting, when it finally realized that the talking head—indeed, in the typical AERA session there were four to six talking heads—was not necessarily an optimal way of enlarging the understanding of its members, it too displayed an interest in alternative forms of data representation.

Second, it is important to realize that the issues I have identified are not issues restricted to scholars in the field of education. Scholars in the social sciences are now and have been coping with similar issues in their fields. It’s in the air. You see it in the work of Clifford Geertz (1983) when he writes about “blurred genres” and “thick description” or when Nelson Goodman (1978) writes about “ways of world making” or when Richard Rorty (1979) writes that pragmatism views science as “one genre of literature” or when George Lakoff and Mark Turner (1989) distinguish between paradigmatic and narrative ways of knowing or when Michael Polanyi (1966) says simply that man [sic] knows more than he can tell. There is no better collection of essays in the field of anthropology that address what some have called “the crisis of representation” than Clifford and Marcus’s (1986) Writing Culture, whose subtitle, The Poetics and Politics of Ethnography, is especially revealing. As I said, it’s in the air.

In the field of education, we find these issues addressed in the work of Kathy Carter (1993), Robert Stake (1995), Connelly and Clandinin (1990), and in the pioneering work of Philip Jackson (1968) and Lou Smith (1968). These scholars are a part of a larger community exploring the assumptions employed in the conduct of science, the usefulness of distinctions between objectivity and subjectivity, the functions of voice in writing, the relationship of the general to the particular, and the utilities and limits of quantification. Again, the edges are being explored.

Although it is important to have a climate that supports the growth of the ideas I have been addressing, climates are not enough to ensure their healthy development. We need to nurture them ourselves. That is best achieved when we are critically reflective about what we are doing. That is best achieved when we ask why we are interested in alternative forms of data representation. What functions do such forms serve? Do we really need them? What are we trying to accomplish with these excursions onto the edges I spoke about earlier? And what is a particular form of representation unlikely to do?

Questions such as these bring me to the core of my remarks. One way to get into that core is for me to describe short segments from two films. The first is a segment from Dead Poets Society (Haft, Witt, Thomas, & Weir, 1989) and the second from a film about Berkeley High in Berkeley, California. I have selected film simply as one example of data representation. Film and video have much to recommend them. They contain dialogue and plot, they display image, and they can use sound, particularly music, to augment image and word. Put another way, film can teach. With film, we can ask: What does the soundtrack tell you, the expressions on the faces of those portrayed, the visual features of the setting? Put another way, how do these films inform? What did the filmmakers do to make this happen? We start with the introductory segment of Dead Poets Society.

What we see early on in this film are two boys, one wearing a beanie and the other wearing a straw boater a tad too big, preparing for some kind of ceremony. The oversized boater makes the boy look something like a miniature adult. It provides a foretaste of what he will someday become. At the same time, the boater symbolizes both class and tradition. The images we see bespeak of hallowed halls, the moneyed east, Princeton, the Ivy League. As we will soon learn, this is no working-class school. The straw boater and the Gothic interior that the boy and the others are soon to enter, banners raised, stepping in a single-file procession to the strains of a bagpipe, exude a sense of tradition and history. The quickness with which the boys respond to the urgent command, “Raise banners!” says the ceremony we are about to witness is serious business.

They enter a long aisle bisecting a chapel-like interior crowded with waiting adults and an all-White student body. Leading the procession is the boy in the beanie followed by the boy in the boater, who in turn are followed by an old man whose trembling hands hold a lit candle. It is the light of knowledge that he passes to a young student sitting in the first row. This young student smiles and nods with gratitude and respect as he receives it. We are at Welton Academy, a venerable institution that, according to its headmaster, is the best preparatory school in America, a school about which we learn that “more than 75% of its students went on to the Ivy Leagues!” But this is not all that we learn.

The filmmakers have created a visual narrative that displays an array of values, not by describing them, but by depicting them. We are drawn into the culture of Welton, almost enveloped by it in only a matter of minutes. In this brief segment, we are given a glimpse of what seems to be an authentic place. We see the well-scrubbed faces of its blazer-jacketed students, the tweedy dress of their parents, the academic regalia of the faculty, the cocky self-assurance of the medaled headmaster. When the boys rise to respond in unison to the question, “Gentlemen, what are the four pillars?” “Tradition, honor, discipline, excellence!,” we feel the elite character of a venerable school supported by wealthy parents, designed to give their sons all that they need to preserve their class and to realize their destinies. Without being didactic, the filmmakers give us what we need to make sense out of what we see and hear. In less than four minutes’ running time, we are introduced to a place we can read, an array of values we can recognize, and a setting we might even grudgingly admire. And if we cannot admire, we think we can understand.

Now, literally speaking, Welton Academy does not exist. This film is fiction. Yet schools like Welton do exist. Just where is the line to be drawn between fact and fiction? Is it between truth and falsehood, reality and its imitation? Assuming that the filmmakers are all qualitative researchers. Assume for a moment that they decided to create this film to share what they had learned from their research regarding the common features of several privileged preparatory schools. Would such a work count as a legitimate form of data representation? It provides no theoretical analysis of...
what it depicts. Its methods—if that term does not seem too mechanical—do not seem replicable. Does this matter? If we insist that a work has to be theoretical to count as research, do we also assume that theory and replicability are necessary conditions for doing research, even if we collectively agree that the film does advance our understanding of places like Welton Academy? And even if we cannot know if places like Welton Academy are indeed like Welton Academy, would this film help us determine if the culture and the values the film depicts can be found in other preparatory schools? Put another way, does the film streamline our search? Does it sensitize us to the possible? Does it offer us an anticipatory set with which to seek and find? Yet, can fiction count as a form of data display? Can fiction count in doing research? Might not the desire to realize artistic values mislead, as they apparently have in Oliver Stone’s Nixon? Questions such as these have been pondered and discussed by narratologists (Mitchell, 1986) and anthropologists (Clifford & Marcus, 1986). The debates lead us once again to the edges of discourse about cognition and representation (Eisner et al., 1996).

Just what is at stake here in this discussion of this film and other alternative forms of data representation? A great deal. What are we dealing with is a conception of how meaning is made and what shall count as knowledge or, to use a more felicitous phrase, how understanding is enlarged. If there are different ways of knowing, what way is this?

The way we usually do research is to reduce what we have learned to text and number. Our official text is propositional; we try to put our experience into claims that propositions can carry. We also try to quantify the qualitative features of our experience—an effort that began, according to Dewey, with Galileo. Dewey writes:

The work of Galileo was not a development, but a revolution. It marked a change from the qualitative to the quantitative or metric; from the heterogenous to the homogeneous; from intrinsic forms to relations; from esthetic harmonies to mathematical formulae; from contemplative enjoyment to active manipulation and control; from rest to change; from eternal objects to temporal sequence. (Dewey, 1929, pp. 94-95)

Put another way, we report the temperature even when we are interested in the heat; we expect a reader to be able to transform the numbers representing the former into the experience that constitutes the latter. New forms of data representation signify our growing interest in inventing ways to represent the heat.

There are, of course, good reasons why text—or more precisely, propositions—should be so central to our traditional view of knowledge. For one, our view of knowledge is tied up with matters of verification, and verification is tied up with matters of truth. Truth is related to claims, and claims cannot be made without making assertions. Assertions, in turn, require propositions, and propositions return us to text.

Philosophers whose epistemologies travel the route I have just described will have no truck with the non-propositional as a source of knowledge (Ayer, 1952). They regard the non-propositional as imprecise and subjective. Non-propositional forms undermine verifiability, compro-
What do we feel when we see Louis Farrakhan on TV in *School Colors*? What do the students feel? How do we know? How do we interpret the relationship displayed on film between the Black studies teacher and his students? What do we make of his arm around his student's shoulder as they leave his classroom?

And what about the White students in the film, the student who says he's "real White" and who quickly follows up with, "I'm just trying to survive"? Does material of this kind enlarge our understanding? If so, how?

The students who produced this film were inquiring into the culture of their school. More than likely, they knew that culture very well and used the opportunity to reveal what they took it to be. Is the visual collage they created a sample of educational research? It is interpretive. As a matter of fact, deciding what to shoot, what to keep, and how to compose the segments is inherently interpretive. How shall we regard such a form of data display, and once again, is it research? My conception of research is broad. I will count as research reflective efforts to study the world and to create ways to share what we have learned about it. Research can take the forms that echo the forms of the arts and humanities or those of the natural and social sciences. Its forms of data representation are open to invention. Ultimately its value as research is determined by the judgment of a critical community. What is your conception of research?

I raise these questions because I think they ought to be pondered. Those of us who think we need new forms of data representation need to be able to explain why. I have partially described some of the features of two examples of visual forms of representation. These examples should be regarded as illustrative of only a small portion of what is possible. I have not talked about readers' theater, still photography, or the use of journals or narratives. I have not spoken of multimedia resources. I have presented only a general picture of some of what I think film and video make possible. Now, let me indicate what I believe to be the promise and the perils of alternative forms of data representation.

First, it is clear that all of the forms of representation I have identified are used to shape experience and to enlarge understanding. Whether you use a story, create a film, employ a diagram, or construct a chart, what such tools have in common is the purpose of illuminating rather than obscuring the message. One reason for selecting one tool rather than another is because it does the job that you want done better than the others. What kind of jobs need to be done?

One job that scholars increasingly want done is engendering a sense of empathy for the lives of the people they wish us to know. Why empathy? Because we have begun to realize that human feeling does not pollute understanding. In fact, understanding others and the situations they face may well require it. Forms of data representation that contribute to empathic participation in the lives of others are necessary for having one kind of access to their lives. Artistically crafted narrative, including the crafting of film, comes into play here. Facts described literally are unlikely to have the power to evoke in the reader what the reader needs to experience to know the person someone portrays. Alternative forms of data representation can make empathically possible when work on those forms are treated as works of art.

Second, alternative forms of data representation can, as in the case of both Welton Academy and Berkeley High, provide a sense of particularity that abstractions cannot render. We come to see the place, to know each individual character. When done well, the situation and the people take on their own distinctive qualities. They acquire dimension. Particularity and dimensionality are conditions of something being "real." One function of all forms of data representation is to confer a sense that what is being portrayed is real. Authenticity is not a bad quality for research of any kind to have.

Third, alternative forms of data representation can provide what might be called "productive ambiguity." By productive ambiguity, I mean that the material presented is more evocative than denotative, and in its evocation, it generates insight and invites attention to complexity. Unlike the traditional ideal of conventional research, some alternative forms of data representation result in less closure and more plausible interpretations of the meaning of the situation. I provided one interpretation of a small section of *Dead Poets Society*; how many other plausible interpretations are possible? The open texture of the form increases the probability that multiple perspectives will emerge. Multiple perspectives make our engagement with the phenomena more complex. Ironically, good research often complicates our lives.

Fourth, alternative forms of data representation promise to increase the variety of questions that we can ask about the educational situations we study. A student who recently learned how to calculate Pearson product moment correlations is likely to look for things to correlate. A student who recently learned how to use a video camera is likely to look for things to shoot. As the use of alternative forms of data representation increases, we can expect new ways of seeing things, new settings for their display, and new problems to tackle. The invention of time-lapse and slow-motion photography has enabled us to see what is otherwise invisible to the naked eye. The invention of the telescope and the microscope has made possible the formation of questions that were unaskable before their presence. Put another way, our capacity to wonder is stimulated by the possibilities that new forms of representation suggest. As we learn to think within the medium we choose to use, we also become more able to raise questions that the media themselves suggest; tools, among other things, are also heuristics.

Finally, the presence of alternative forms of data representation allows us to exploit individual aptitudes. Neither the literal nor the quantitative are everybody's cup of tea. Individuals who shine at the creation of a film or story might have little competence using the modes of thought and the forms of representation used in conventional types of research. If intelligence can be defined, as Olson (1988) suggested, as skill in a medium, then the use of different media for the creation of research is a way to activate wider varieties of human intelligence. This, I take it, would not be a bad thing.

If the virtues I have described are the positive side of alternative forms of data representation, what are the perils?

Consider the matter of referential precision. One of the ideals of conventional social science is to reduce ambiguity
and increase precision: What one seeks are claims and explanations that give as little space as possible to competing explanations, rival hypotheses, or personal judgment. The operational definition and the objective test stand as encomia to such aspirations.

Many alternative forms of data representation do not provide that kind of precision. The visual display of a scene in a classroom or a school can be seen from multiple perspectives. Is it important for the viewer to know the perspective taken by the researcher, or is it not necessary? What will count as a misinterpretation? You will remember that I identified ambiguity as a potential source of insight, a way of keeping the door open for fresh insights and multiple interpretations. Yet ambiguity is not without its perils. One peril of ambiguity is the Rorschach syndrome: Everyone confers his or her own idiosyncratic meaning to the data. No consensus is possible. The data mean whatever anyone wants them to mean; or worse, no knows what they mean.

Clearly, there is a trade-off here. How much precision do we need? When is precision constraining? How shall we test—if that’s the right word—the validity of the data or their meaning. How shall we know if we are advancing the conversation? Those questions need to be addressed.

A second peril has to do with a problem inherent in the use of alternative forms of data representation, but in a potential backlash from their use. I have no doubt that there will be presentations of research that more than a few in the educational research community will consider bizarre. Their amazement is not a good reason for not exploring the edges of possibility, but it is a reason to recognize the need for interpretation, especially for those who sail by other stars. It is a good reason for describing the context in which the results of research are to be presented.

A genre of work can stand alone without an interpretive context when those reading, seeing, or hearing it bring that context with them. When they do not, they are likely to be lost. Few people like to be lost. When the terrain is new, we need context. We also need to be sure, if we can be, that we are not substituting novelty and cleverness for substance. In other words, we need to be our own toughest critics.

Third, consider the constraints imposed by our publication system on material that does not take printed form. Where, for example, will the video segments so central to a presentation appear? Give the practical need of establishing a publication record, not to mention our need to share what we have learned, the current constraints on the use of alternative forms of representation are not insignificant.

There is promise, however. That promise may reside in the use of the computer and in the creation of multimedia displays for capturing the meanings new forms of data representation make possible. It is not beyond our practical capabilities to provide material that combines text and image, image and music, music and measurement. The computer may make possible what our pictureless journals find impossible to provide. The current constraints may be temporary.

Let me return to where I started. How do we display what we have learned? What forms can we trust? What modes are legitimate? How shall we know? Those questions and how we explore them can help redefine what educational research means, how it is pursued, and what we can learn from it. It can enlarge our discourse and widen our conceptions.

I cannot think of a more important agenda. We are, in a sense, looking for new stars. We are also looking for new seas. We are, as I said earlier, exploring the edges. There is, I think, no better place from which to see the stars and no better position from which to discover new seas than the view one gets from the edge.

“Come to the edge," he said. They said, “We are afraid." “Come to the edge," he said. They came. He pushed them. And they flew.

—Apollinaire

Notes

This article was delivered as a keynote address at the 1996 Conference on Qualitative Research in Education at the University of Georgia. I want to express my gratitude to Mike Atkin and Alan Peshkin for their very helpful comments while I was preparing this article. Because the form an article takes is part of its content, I chose to retain the form in which this article was originally prepared, that of an oral delivery.

1 See, for example, Qualitative Inquiry and the International Journal of Qualitative Studies in Education.

2 I am unable to include the films from which the descriptions to follow were derived—which is exactly my point about the limits of our journals and traditions.

References


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