The N of 1 in Arts-Based Research: Reliability and Validity

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Abstract

N signifies the number of data samples in a study. Traditional research values numerous data samples as this reduces the variability created by extremes. Alternatively, arts-based research privileges the outlier, the N of 1. Oftentimes, what is unique and outside the norm is the focus. There are three approaches to the N of 1 in arts-based research: imaginative forming, teacher research of becoming, and perpetual provoking. These three outlier views of arts-based research conflict with each other, yet Graeme Sullivan's (2010) Framework for Visual Arts Research easily accommodates all three. Furthermore, these approaches are not static. Criteria for assessing the quality of arts-based educational research lie in how imaginatively and dynamically the work moves within Sullivan's Framework. Ultimately, to consider a work of arts-based research as educational, it must engage pragmatic concerns of teaching and classrooms.
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The representation of N in quantitative research relates to the statistical concept of reliability. N signifies the number of data samples in a study. Numerous data samples begin to create cluster patterns that reduce the variability created by extremes. Patterns suggest pathways. For example, on a matrix tracing the interactions of independent and dependent variables, only through numerous samples can a line of regression (a pathway) emerge that allows a researcher to report the effects of a treatment in such a way that we may have trust in a prediction of future outcomes. The pathway (the line of regression) points to our future expectations. Outliers from this line are anomalies. In fact, it is acceptable practice in quantitative research to judiciously discard outliers that may muddy our focus.

In education, it is common to think that an N that stands alone is an outlier that skews our overall view of the data. For example, when calculating scores from student evaluations, it is generally acceptable to discard the high score and low score, as the inclusion of outliers may invite Simpson’s Paradox where a rogue N wildly outweighs a mean score and provokes movement in a direction opposite to the median. In this paradigm, outliers distort. They mask our ability to act most judiciously for the public good. Such a concept of research sees the public good as addressed by the quantity of people who cluster around the average. This is validity. Thus in education, we commonly judge outliers as falling outside of our concern to serve the public good as they lie too far afield.

Today, we see the international consequences of this paradigm as realized through holding schools accountable to reliable standardized performance tests. Schools that do not meet the pre-set benchmarks concentrate educational resources on those students clustered just below the cut mark, as these students hold the greatest hope that a slight improvement will push them over the established standard. Students just above the cut mark also receive considerable attention in order that they hold their precarious position. Students well above the cut mark—one type of outlier—can fend for themselves. Those students furthest below the mark—another but more troublesome outlier—receive minimal resources, as these students are too far beyond hope. Beyond hope, at least, as along as the public good is associated with reliably average scores. Thus, our belief in the concept of N as directing us to a vision of the public good, allows us to dismiss some elements of the public as beyond our best efforts.

In contrast, arts-based research privileges the outlier. Oftentimes, what is unique, what lies outside any concept of norm is the focus. Validity in arts-based research begins with considering the overlooked case. However, different forms of arts-based research work with an N of 1 in different ways; therefore, there is a need for constantly qualifying what kind of arts-based research one is using as this can change conceptions of arts-based validity and reliability.
Arts-based research contains three approaches to the N of 1: 1) The N of 1 as imaginative forming; 2) The N of 1 as a teacher research of becoming; and 3) The N of 1 as perpetual provoking. These approaches are modest additions to Sullivan's larger conceptual Framework of Visual Arts Research (2010, p. 102). These three arts-based research approaches have their own conceptual frameworks—which can be at odds with each other. Nevertheless, all three fall within a realm of arts-based research. However, I adhere to Eisner's (2008) qualification that arts-based educational research is its own sub-category within arts-based research. Therefore, it is important to note that there can be forms of arts-based research that are not arts-based educational research. Furthermore, all arts-based research conducted by educators is not inherently arts-based educational research. It would be helpful to the field of arts-based research and arts-based educational research if researchers clearly declared more fine-grained distinctions in the methodological framework and research objectives of their work.

### Three Roles of Outliers

**The N of 1 as Imaginative Forming**

The arts, parallel to the rise of statistical, managerial thinking, have presented an alternative vision of how to look at the public good. Since the 19th century, the artistic movement of modernism has focused on bringing all aspects of society into critical examination. This tradition has challenged artists to look at the insignificant or irrelevant aspects of society and reshape them in such a way that they demand our attention and consideration.

In one view of arts-based research, the outlier is a challenge to our imagination. It forces our imagination to grow. This might be seen as a German Idealist function of art, the challenge to try to bring into a conceptual field that which is currently beyond our mental visualization and comprehension, in the hope that something new, something bigger, something more cohesive might emerge. In short, ideas gain form.

Modern art searches for new understandings of validity: what are the items that belong in our conversation, what are the items that need to hold a place in our consciousness? For example, Picasso's *Guernica* (1937)—a painting of the horrors of the bombing attack on a Basque village on April 26, 1937 during the Spanish Civil War—holds, to this day, our attention as a reflection on the tragedy of war. The painting carries an emotional forcefulness that may be lost in written historical recordings of the event. A work like *Guernica* does not attempt to explain, or synthesize. It bears witness. It is a refusal to remain silent in the hopes that there is public outrage against such atrocities. This arts tradition maintains it importance to the public sphere as an expansion of what we can hold in our imaginations, not by regression to the mean. Arts-based research that follows a modernist tradition engages in acts of uncoverage.
Eisner's arts-based educational research methodology of educational criticism (1998) falls within this modernist conception. This method is rooted in better understanding the life of classrooms and grounded in the concept of teaching as an artistic performance that has form. He offers three criteria for assessing the validity of a research study.

- **Referential adequacy:** Can we find the evidence in the study for ourselves? Does the emperor have clothes? In short, is the claimed evidence more than rhetoric; is it verifiable?
- **Structural corroboration:** Is the inferential reasoning coherent and based on the evidence? Does the author supply sufficient evidence that the interpretation remains compelling even if we can identify counter evidence?
- **Consensual validation:** Finally, while there may be evidence, and the interpretation of evidence may be believable, this interpretation must change the way that a reader sees the world. The reader must testify that such a reading has brought a reconsideration of his or her own practice and action.

Here the assumption is that the educational good is something added. Eisner sites Dewey's claim that the purpose of criticism is the enlargement of perception (1934/1989). Through the arts, we form a larger vision; we hold more in the scope of consideration. Most critically, we act on this more encompassing vision to bring outliers into view and into a conversation. In the end, the educator inclusively fashions an array of ever expanding forms.

**The N of 1 as a Teacher Research of Becoming**

Contemporary conceptions of art as individual transformation stem from psychoanalytic traditions tied to expression of emotions and mental health. Victor Lowenfeld's *Creative and Mental Growth* (1947) is an early exemplar. Contemporary practice includes the works of Shaun McNiff (1998). While this too is a view of forming a whole—and thus fundamentally modernist in its orientation—it also plays off of other traditions such as Jacques Lacan (2002) and forms of semiotic self-narrative as represented by Mikhail Bakhtin (1981).

Central to the shift is an emphasis on the verb *becoming* from the noun of *form*. The arts-based research methodology of a/r/tography that focuses on becoming provides this contrast with educational criticism that emphasizes the finding of form (Springgay, Irwin, Leggo & Gouzouasis, 2008).

Dewey (1934/1987) suggests that a criterion for a work of art is its ability to reorganize space and time. This requires a shattering of recognition and in its place a rebuilding of perception. A/r/tography focuses on individual Deweyian rebuilding with a keen eye to Dewey's insistence that this is always a formative work in progress. There is no reliable summative end
product. Works in process veer, back-step, and change course. They have flexible purposing (Dewey, 1938). This process does not end in rest and reassurance. The disrupting of the narrative of our past throws us out of balance, and we adapt. If we are in balance, then this artificial state lacks validity. We go back and disrupt ourselves again. A/r/tography does not have criteria for engagement, but renderings. These include:

- **Contiguity**: That which lies adjacent but juxtaposed, and unresolved.
- **Living Inquiry**: Change is continuous and we live in ever-changing organic cultures that never establish into the comfort of best practice.
- **Metaphor and Metonymy**: We make meaning by bricolaging that which is familiar to us into new understanding.
- **Openings**: Experiential tears and ruptures force the imagination into new constructions.
- **Reverberations**: Forces that cause disequilibrium and require the research to shift.
- **Excess**: Pushing past form, not simplify to achieve clarity, but to more willfully trouble and make messy in order to unsettle the comfort of understanding.

These are renderings of transformation and becoming that seek to re-orient, re-establish, the researchers own metacognitive awareness of self-presence in teaching: how one's own presence shapes and is continually shaped by the live interaction with those whom we educate and care for.

At the heart of a/r/tography is a Foucaultian sense of the care of self (Foucault, 1988). Only in a coming to care for who we are, in a reflexively disciplined authentic manner that includes linguistic, non-linguistic, and somatic performative actions, can a teacher aspire to engage a common good. It is a highly individualized methodology, but a process of transformation that aspires to allow us to open more fully to those with whom we engage—and perhaps teach.

**The N of 1 as Perpetual Provoking**

What if the outlier is not to be normed—not to be synthesized—but remains an unresolved challenge to re-thinking and an impossibility? Rancière (2009) reminds us that aesthetics is the ability to think contradiction. In this conception, the outlier does not force a synthesis of broader understanding, but creates an incessant dissonance that never assimilates and refuses to go away.

In this case, a radical outlier does more than skew; it erases the norm. Here the task of arts-based research is not to make the vision of understanding more robust, more inclusive, or more complex, but instead to subvert this system of understanding for no-other reason than to provoke, to prevent conclusion, or to unsettle any capacity to act. It may even be a willful
occlusion. By shutting out, there is a possibility that a new form of conceptualization will fill the subsequent void.

Here, we begin to see that Ns of 1 in arts-based research may be anti-ethical to each other, with fundamentally different conceptions of the public good, running a spectrum of good as an additive doing, to good as an extraordinary attempt at rending and not doing.

Contemporary art practice provides numerous examples of the art and research as not-doing. Consider Robert Rauschenberg’s (1953) erasure of a drawing by Wilhelm de Kooning, now in the collection of the San Francisco Museum of Modern Art. This work is literally the remnants of Rauschenberg's total erasure (done after de Kooning's consent) of an original drawing by de Kooning. Rauschenberg removed the sacred mark of the artist; he sucked the life out of de Kooning's form and made it unseeable. A work of art is not always a rendering into sight, but can also be a removal—as much a troubling of what might be seen as an assertion of what to see.

Thus, when Dewey says that criticism is the enlargement of perception, there is also the ironic possibility that an enlargement of perception is to actually see less. To learn how to see means that the world that we confidently hold in view dissipates and disappears. This may happen without a promise of a replacement. The work of art is the erasure; it does not predict what comes next.

This third path of the N of 1 relies heavily on French post-modern theory. The arts-based research outlier remains a joker, a provocateur, and an untamed experience that is never expected to result in assimilation. Its role is to perpetually disrupt, trouble, and remain renegade.

In their recent book on arts-based research Jan Jagodzinski and Jason Wallin (2013) eschew the concept of criteria for judging form and the concept of renderings for assessing becomings (as becomings suggest a journey to form). Instead, they offer seven provocations:

1) Trouble the rhizome: Rhizomes are simulacra, i.e. perfect copies. Therefore, the metaphor, as presented by Deleuze and Guattari (1987), does not assure change.

2) Mutate: By attacking previous form, art metamorphoses. A mutation maintains family resemblances but is initially horrific.

3) Do nothing. The becoming of a/r/tography is a doing. The forming of imagination is a doing. However, here art is a form of stopping to do, and assumes that in a void, something else will fill the space.

4) Steal and cheat: Art is in constant struggle with neo-liberalism to absorb and
commercialize creative production. Therefore, stealing back from neo-liberal commercialism can make art.

5: **Becoming inhuman**: Deleuze and Guattari (1987) speak to becoming animal and the conscious of the swarm as an alternative to linear rational thinking.

6: **Lose face**: Rather than construct identity, deconstruct it. This does not mean the creation of alternative selves (such as in a Second Life curriculum where students participate through avatars), but an active engagement with undoing: a stripping back of veneers, a radical questioning of ones own subjectivity.

7: **To Betray Well**: The relentless tearing down of form are acts to live perpetually outside of form, and there perhaps is the promise of an authentic individuality.

These seven provocations provide criteria for an arts-based democratic social practice. Here reliability (again often based on an N of 1) and validity are assessed in forms of un-doing: in acts of deconstruction. This is the full opposite of holding a larger vision together; these are acts of subterfuge, sabotage, and anarchism. In relentless acts of tearing, the ungainly, the unimaginable and thus the terrifying, emerge into our consciousness. The outlier does not enlarge the norm as much as the norm acknowledges an open fissure that cannot heal. That outlier is evidence of a perpetual wound: a perpetual irritant that remains unabsorbed.

This approach to art research is not necessarily limited to works that we would now refer to as post-modern. Igor Stravinsky (1963) claimed that Beethoven's *Grand Fugue* for string quartet was a work that was absolutely contemporary when composed in 1825, and through its continuing refusal to submit to formal musical analysis "will be contemporary forever" (p. 24). In short, it remains an open wound, never to fully heal, or achieve closure and categorization. It betrays the classical form, prefigures 12-tone music, but remains its own thoroughly unique mutation.

**The Irreconcilability of Arts-Based Research**

These three outlier views of arts-based research conflict with each other. For example, an inclusive, imaginative expansion runs counter to a concept of insistent minoritarian estrangement (Deleuze & Guattari, 1987). These views differ and perhaps remain irreconcilable (although Dewey seems to effortlessly transverse all three). However, they are all strategies for art making and art appreciation. Nevertheless, how well do these models overlay on the purposes and goals of educational research?

I continue to find Graeme Sullivan's Framework for Visual Arts Research (2010, p. 102) a useful mapping of the terrain of visual arts research defined as a tension between three factors: Personal Agency, Social Action, and Empirical Structure (Figure 1).
These poles create dimensions of practice: Meaning, Explanation, and personal and social Change. As one moves towards each pole, distinctive domains of practice emerge: the Interpretivist, the Empiricist, and the Critical.

Using Sullivan’s schematic, it is possible to place the three outlier approaches to arts-based research that I have discussed: 1) imaginative forming, as represented in the work of Elliot Eisner; 2) research of personal becoming as represented by the theory of a/r/tography) and 3) perpetual provocation as represented by jan jagodzinski and Jason Wallin (Figure 2).
The Pragmatic Concerns of Education

All three of these outlier responses are easily accommodated within Sullivan's framework as arts-based research. However, I return to Eisner's concern that at the end of the day, educational research, of any kind, must help us shape the pragmatic concerns of how we educate both inside schools as well as in the non-school hours (understanding that pragmatic concerns are how we grow into a more inclusive, socially just future). To use Sullivan's model, education is fundamentally an explanatory process. This is what the teacher controls. While meaning and change may be the outcomes we seek in education, these are not what a teacher can do, but come through student response. A teacher places action in motion in the hopes that students construct meaning and engage in change. Thus, the pragmatic concerns of education most readily fall along what Sullivan calls the Explanatory Dimension.

Arts-based educational research specifically addresses the lifeworlds of classrooms as an arena of things ignored, things obscured, and things suppressed. Arts-based educational research challenges our systems to attend to these other realms of consideration. The arts help us to perceive what we have overlooked. Before reliability, arts-based educational research seeks validity—to bring new items of importance into view. In particular, so that others might
see similar concerns and take pragmatic action. If others see the concerns of this N of 1 as well, reliability emerges.

Therefore, a criterion for validity in arts-based educational research is whether it expands our consciousness of what matters in teaching and learning. Such a leap is not meant to emphasize the N of 1 but is designed to bring the outlier in to a larger realm of understanding.

However, a problem with Figure 2 is that works of arts-based educational research are not static. Good work traverses domains. I would suggest that the degree to which a work cuts across Sullivan's framework is a second criterion for evaluating excellence in a work of arts-based educational inquiry. A particular issue is how the work moves in relation to the Explanatory Dimension. The research need not start there. It need not end there. However, somewhere along the journey, the Explanatory Dimension needs to be reckoned with.

John Dewey (1934/1987) suggested that quality in this case could be assessed by the ability of the research to reorganize space and time. The work needs to be more than a testimonial that the researcher's sense of space and time is transformed; the researcher's journey must transform the reader. How then might we begin to construct criteria for the quality of the journey? Martin Heidegger (1971) suggests a journey is "a throw." Throws are plunges; throws take risks. Arts-based research should dare, it should be willing to swerve off course, and seek startling juxtapositions. That which we might have thought was tangential or insignificant should be brought into consideration. A throw itself is motion. It requires movement from one point to another. A throw itself is often a border crosser. However, throws must appear to be authentic and not contrived. An authentic throw is something that we have not seen before. It is not of a kind or belonging to a class; it is an N of 1.

So, even though a work might weigh itself toward a domain of Interpretivist, Empiricist, or Critical, it should not remain statically within that domain. It should move, and the quality of that movement is a means for assessing reliability and validity of the work. All good works of arts-based research should be border crossers that slip boundaries. Works of arts-based educational research steer somehow in relation to the demands of education.

If we sail into other domains of arts-based research—venturing far afield to the Explanatory Dimension—arts-based educational research has an obligation to demonstrate how this research journey may come home to a pragmatic footing in the Explanatory Dimension. This task becomes a third criterion of a work of arts-based educational research: does it illuminate how we will act, as an educator, tomorrow? The research has to be more than a compelling tale of the researcher's personal transformation. The research needs to be more than a provocation. The work has to deconstruct and then offer a direction for the reconstruction of
the perception of the reader, in an educationally significant way. At a minimum, a work of arts-based educational research needs to suggest a method for working the ruins of deconstruction that will lead to a new perception of practice and policy.

Why should that pragmatic concern be something for arts-based educational research to bear, when it is not a concern for arts-based research? First, there is a pragmatic concern for university education professors who supervise works of arts-based research. If works of arts-based research fail to show clear connections to how practitioners can use this research to improve practice, will these researchers—our graduate students—have difficulty in securing positions in higher education? I am concerned that the majority of higher education positions—even those in research universities—will not be interested in a scholar whose work only resonates with an N of 1. University search committees will want to know how the candidate's research relates to the students at their institution and to the communities that the university or college serves. Therefore, a university supervisor of an arts-based research dissertation must give serious consideration to the harm that a graduate student may be doing to him or herself if the N of 1 does not open itself into larger dialogues in which other people find relevance to educational issues.

Education is profoundly pragmatic. A child stands before us on Monday morning. As a teacher, we are responsible for doing something. We must make a mark; we are expected to form a curriculum in which this child will participate. Thus, arts-based educational research holds an inherent tension. It is a methodology of dissensus (Rancière, 2010), and any attempt to homogenize or to standardize to a mean is intrinsically troubling. Therefore, arts-based educational research methodologies inherently works against texts and how-to-complete-your-dissertation self-help books. These methodologies do not easily allow the practitioner to know what steps to follow as arts-based methodologies propel practitioners into thinking contradiction. This is a risk for both supervisors and students who choose to select this methodological path. How in an academic program that is designed to produce researchers for the academic system—where graduate students will need to secure approval from anonymous professionals in the discipline for publication and tenure—would you knowingly allow a student to potentially pursue research that could ultimately leave the student as an outlier, an N of 1?

Therefore, real concerns arise about allowing novice researchers to train in arts-based methods. We risk romanticizing and over simplifying outcomes, instead of forthrightly standing in complexity that being an authentic outlier demands. We should heed with great caution the admonition that art, and therefore arts-based educational research is fundamentally useless: to force a utility on art, to expect art to do certain things, is to undermine authenticity. For example, how does authentic arts-based research conform to the demands of
a dissertation prospectus when an authentic artistic throw is a radical departure from academic process? A prospectus is an exercise in showing an advisory committee that the candidate knows what she or he is doing. A throw is a risk of not knowing. These are treacherous waters; we should be cautious at allowing aspiring academics to rush into them. I fear that too many doctoral students, particularly in arts education, are attracted to arts-based research methods, as they seem familiar; these new scholars do not yet grasp the difficulty of the method.

In all of these cases, the N of 1 is a provocateur. When introducing our students to research, with the expectations for validity and reliability inherent in academic practice, we should acknowledge that arts-based educational research is a mercurial form of engagement. We should urge our students to approach it with caution.

References


**About the Author**

Richard Siegesmund is Professor and Head of Art+Design Education at Northern Illinois University's School of Art and Design. He has received individual fellowship awards from the Getty Education Institute for the Arts and the National Endowment for the Arts, as well as being a Fulbright Scholar. He serves as a Visiting Fellow to the Research Institute of the National College of Art and Design, Dublin, Ireland. A recipient of the Manual Barkan Award for research from the National Art Education Association, he is also an elected Foundation Fellow of the organization. He is a member of the Council for Policy Studies in Art Education. With Melissa Cahnmann-Taylor, he co-edited *Arts-Based Research in Education: Foundations for Practice*. Recent publications include “Dewey Through A/r/tography,” published in *Visual Arts Research Journal* and “The Visual Space of Literacy in Art Education” with Karinna Riddett-Moore, in *Literacy across the curriculum: Dilemmas and solutions, Grades 6-12* published by Corwin.