Visualizing Evaluation Theory: Tree, Forest, or Ocean Currents?

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Background: Evaluation theories depicted as a five-branch tree reflect the assumptions of the postpositivist, constructivist, pragmatic, transformative, and Indigenous paradigms. A tree is useful because it provides a quick and clear way to show that different assumptions lead to different methodological decisions.

Purpose: The purpose is to explore the advantages and limitations of using a five-branch tree to depict evaluation theory and to consider alternative visualizations.

Setting: The theoretical literature of evaluation.

Intervention: Not applicable.

Research Design: A review of literature related to the visualization of evaluation theory was used as a basis for this article.

Data Collection and Analysis: The work of Alkin and Christie on the evaluation theory tree was reviewed, along with the visualizations of transformative evaluator Mertens and the Indigenous scholar Bagele Chilisa.

Findings: The representation of evaluation theory as a five-branch tree is limited because it does not show interrelationships among the paradigms. An ocean current visualization could accomplish that task, but it might not be a familiar concept for some populations. Evaluators need to check with stakeholders to ensure the visualizations that are used are viewed as useful to their purposes.

Keywords: transformative; Indigenous; epistemology; axiology; ontology; methodology.

Historical Background

The evaluation world went through a period called the "paradigm wars" in the early 1970s, during which time evaluators argued strenuously about which was better: quantitative or qualitative methods. The landmark work of Guba and Lincoln (1989, 2005) provided a way out of the acrimony when they noted that the arguments were not really about methods. Rather, methodological choices rest on a worldview (or paradigm) and the accompanying assumptions that constitute the worldview:

> Paradigms are frameworks that are made up of a number of assumptions related to the nature of ethics and values (axiology); the nature of reality (ontology); the nature of knowledge and the relationships between the evaluator and stakeholders (epistemology); and the nature of systematic inquiry (methodology). (Mertens, 2018, 2020; Mertens & Wilson, 2019, as cited in Mertens, 2023, pp. 12–13)

During the "paradigm wars," those who were "quants" held a worldview that aligned with the postpositivist paradigm, and the assumptions associated with that view led them to choose quantitative methods. Similarly, those who were "quals" aligned with the constructivist paradigm, the assumptions of which led them to choose qualitative methods. Thus, the stage was set for articulating the assumptions that led to methodological choices.

My evaluation career began in the early 1970s and focused then (as it does now) on adapting methodologies to evaluate programs for members of marginalized populations, such as women in the workforce, people with disabilities, high school dropouts, and people living in poverty. The assumptions of the postpositivist paradigm were too constraining for me, as I felt the need to gather data about the quality of people's experiences as part of understanding the contexts in which they lived and worked, and to develop interventions that were viewed as valuable by these populations. The assumptions of the constructivist paradigm were also too constraining for me, as I had been trained in quantitative methods and saw value in collecting both quantitative and qualitative data. Thus, I felt a bit uneasy because neither paradigm seemed to encompass my needs. In addition, the constructivists and post-positivists did not have at their core an assumption that evaluation should be done to support transformative change that would

lead to increased justice for marginalized and vulnerable populations. I saw this as a missing part in the assumptions of the constructivist and post-positivist paradigms; this served to motivate me to develop a set of assumptions that became the transformative paradigm that explicitly focused on the increase of justice.

Two events in my life pushed me to explore the meaning of doing transformative evaluation: My presidential theme for the American Evaluation Association's 1998 meeting was "Transforming Society through Evaluation" (Mertens, 1999). I also signed a contract with Sage to publish the first edition of *Research and Evaluation in Education and Psychology* (Mertens, 1998), in which I introduced the emancipatory paradigm. In subsequent editions, I began to call it the transformative paradigm (now in the sixth edition, Mertens, 2024), because I wanted to reflect the idea of working together for transformative change rather than an act of emancipating a population.

The Evaluation Theory Tree

The visualization of evaluation theory as a tree began with the first edition of Alkin's *Evaluation Roots* (2004), which displayed a tree with three branches: methods, use, and values. The three branches align with three paradigms that were recognized in the evaluation world: postpositivism, constructivism, and pragmatism. (The three-branch tree continues to be Alkin and Christie's [2023] choice for visualization of evaluation theory in the third edition of *Evaluation Roots*.) Their tree did not include the transformative paradigm. When I asked Alkin about this, he said that the concepts associated with the transformative paradigm could be included in the values branch. My concern was that the values branch in the first edition did not include many of the evaluation theorists who explicitly committed to a social justice purpose for evaluation. This led me to add a branch to the tree: the social justice branch; this was the impetus to have a visualization of a four-branch tree. Later, based on the work of Indigenous scholars and their articulation of an Indigenous paradigm (Chilisa, 2020; Chilisa & Mertens, 2021; Chouinard & Cram, 2019; Cram & Chouinard, 2023), I adopted the five-branch tree to visually depict evaluation theories in my writing and teaching (see Figure 1). Chilisa (2020) labeled the branch that aligns with the Indigenous paradigm as needs and context.

Figure 1. Five-Branch Evaluation Theory Tree
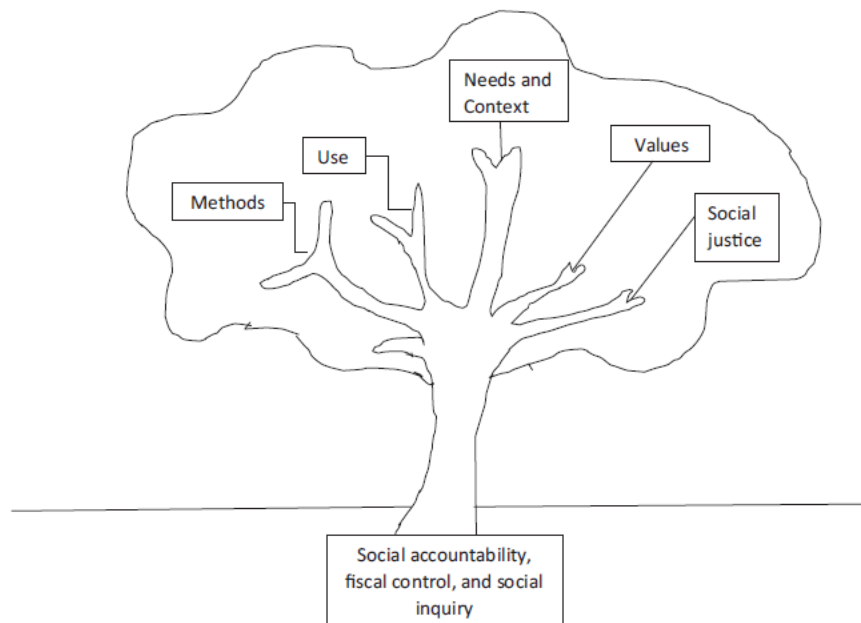
Note. From *Indigenous Research Methodologies* (p. 118), by B. Chilisa, 2020, Sage. Copyright 2020 by B. Chilisa).

So, my depiction of evaluation theory as a tree is based on Christie and Alkin's (2004) contribution to visualizing evaluation theory, and on my desire to situate the transformative paradigm within the academic literature in a way that allows readers to see the added value of explicitly considering issues of social justice. The basic structure of the visual shows branches that depict different paradigmatic and theoretical orientations in evaluation. This visualization is useful when the conversation turns to discussions about the "best" method for an evaluation because it promotes examination of the assumptions that underlie decisions about methods. Evaluators I work with who also commit to increasing justice tell me it is helpful to support their selection of methods that reflect the transformative paradigm, such as including and taking time to build culturally responsive relationships with a full range of stakeholders, structuring interactions with stakeholders in ways that address power inequities and values community-based knowledge, and analyzing contextual factors that support or inhibit transformative change.

Limitations of the Tree Visualization and Options with Permeable Borders

As with any visualization, depicting evaluation theories as a tree has limits. The visualization shows branches that go off in independent directions and seem to have little interaction with the other branches. One of the growth areas in evaluation theories is the territory of permeable borders among the paradigms (Chilisa & Mertens, 2021; Cram & Mertens, 2015; Mertens, 2023, 2024). Some have suggested that the evaluation theories should be depicted as a forest because trees in a forest have synergistic relationships. Wohlleben (2016) explored this concept in *The Hidden Life of Trees*, in which he documents the interdependence of trees in a forest. Billman, Mertens, Chilisa, and Ofir (2021) explored the implications of a forest metaphor at the American Evaluation Association's 2021 meeting in their presentation entitled "Uprooting the Tree: Rethinking the Philosophical Foundations of Evaluation." This forest visualization would open the possibility of many other paradigmatic worldviews that could emerge from evaluators across the world, and it provides mechanisms for relationships to emerge amongst the various worldviews.

Water visualizations have also been suggested as an alternative to the tree visualization. Patton (2022) suggested a river as a metaphor, but I prefer a different water-based visualization, i.e., ocean currents and the global ocean conveyer belt. This image provides a mechanism for sharing across theoretical branches in a dynamic way (see Figure 2; Mertens et al., in press). According to the National Oceanic and Atmospheric Administration (NOAA, 2023b), an ocean current is a movement of water created by a number of factors such as wind, tides, temperature, salinity, and the magnetic pull of the sun and moon. The ocean's currents are fairly shallow and flow for long distances and influence climate changes. Another deep-water circulation system called the global conveyer belt moves water around the globe in a constant motion and allows the water from each of the ocean currents to intermix at a deep level before warming and rising to the surface again. Evaluation theory could be visualized in this way, such that the individual currents represent the various paradigms and the global conveyer belt is the mechanism for intermingling ideas across paradigms. This depiction has the added benefit of demonstrating that, just as there are many forces that affect the ocean currents, multiple forces influence evaluation theories, methods, and decisions.

Figure 2. Global Ocean Conveyer Belt as Metaphor for Evaluation Theory Branches
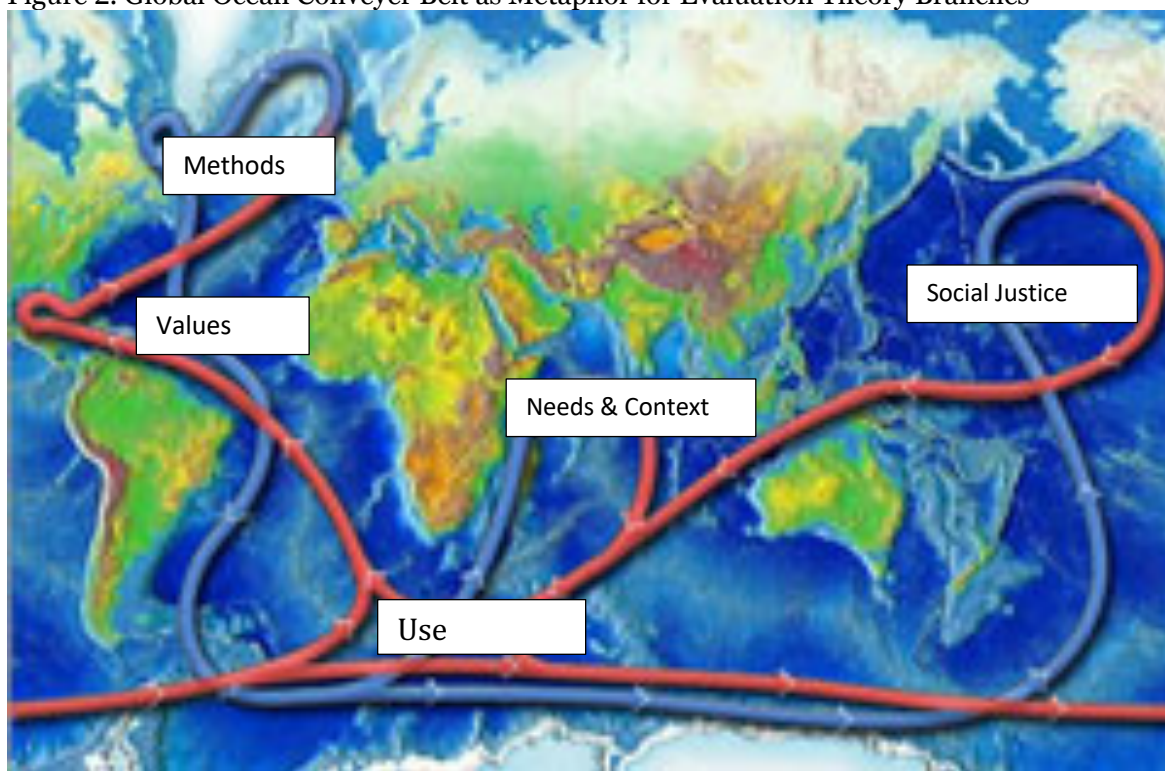
Note. Adapted from *The Global Conveyer Belt*, by the National Oceanic and Atmospheric Administration (NOAA), 2023a (https://oceanservice.noaa.gov/education/tutorial_currents/05conveyor2.html)

Theoretical advancements in mixed-methods evaluations buttress the visualization of evaluation theories in terms of ocean currents and the global ocean conveyer belt because this graphic illustrates the potential for learning across paradigmatic borders. These advancements reflect the position that mixed methods (the combination of both quantitative and qualitative methods) can be included in evaluations under any of the paradigms that are used in the evaluation world (Mertens, 2023, 2024; Mertens et al., in press).

Limitations and Cautions of Visualizations

The label "Social Justice" for the branch that aligns with the transformative paradigm is not expansive enough to incorporate the types of justice that need to be addressed if we are to meet the grand challenges of our time. The international community has made a commitment through their endorsement of the Sustainable Development

Goals to increase three types of justice: social, economic, and environmental justice (United Nations, 2015). In the past, international development's primary focus was on reducing poverty through economic development. However, research on climate change and its impact on the poorest of the poor and other marginalized populations has raised awareness of the need to consider environmental and social justice when implementing economic development programs. Thus, a more accurate depiction of the branch aligned with the transformative paradigm would be the social, economic, and environmental justice branch.

A second area of concern has arisen based on scholarship that shows that visual presentations can be racist or activate stereotypic thinking based on other characteristics (Holder & Xiong, 2022; Schwabish & Feng, 2021: Mertens et al., in press; Rothstein, 2017). Case in point: When I was discussing visualizations with Bagele Chilisa, she expressed a preference for the theory tree rather than the ocean currents because everyone knows what a tree looks like. People who live in landlocked countries, such as Botswana (as does Chilisa), may have never seen the ocean and would not be able to relate to the ocean current visualization in a meaningful way.

Schwabish and Feng (2021) developed a guide for visualization of data called *Do No Harm Guide: Applying Equity Awareness in Data Visualization*. While the guide focuses on visual presentation of data, it has implications for visualizations that depict evaluation theory as well. They wrote:

> Applying a DEI [diversity, equity and inclusion] lens to how we analyze, visualize, and communicate data requires empathizing with both the communities whose data we are visualizing as well as the readers and target audiences for our work. This means considering how the lived experiences and perspectives of our study populations and readers affect how they will receive and perceive the information. (p. 4)

Their suggestions for doing no harm through visualizations include:

- putting people first by including text that explains the visualization within a historical context
- including personal narratives that illustrate the meaning of the visualizations
- having a means for audience feedback about the visualizations

- making the visualizations accessible to those with disabilities or who speak a language other than English.

Conclusions

Visualization of evaluation theory as a tree has historical roots (pun intended) in the work of Alkin and Christie (2023). The lack of representation of members of marginalized groups and advocates for social justice on the tree led me to add a social justice branch that aligns with the assumptions of the transformative paradigm. The social justice branch is useful because it provides a framework for evaluations that commit to an explicit goal of increasing justice and supporting transformative change. Indigenous scholars added an Indigenous theoretical branch called "needs and context"; this is a critical addition, as it provides visibility to their theories and to approaches that illuminate understandings of culture and context in Indigenous communities. The expansion of the international community to include aspects of social, economic, and environmental justice means that the concept of justice needs to be expanded. Advances from mixed-methods evaluators have called for visualizations that allow for permeability across paradigmatic borders. Evaluators should be ever cautious about the use of visualizations so that they are not misleading or reinforcing harmful stereotypes. We might visualize evaluation theory in a way that social, economic, and environmental justice overlay all branches of the tree; that is work that still needs to be done.

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