
Decolonizing Data Visualization: A History and Future of Indigenous Data Visualization

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Background: On the whole, the field of data visualization is white. Contemporary views of historical data visualization tend to trace back to a few iconic visuals tied to European wars and conquests. The modern explosion of the field has been centered around the ideas of white men, as if they invented data visualization. Yet, Indigenous populations worldwide have been incorporating data visualization into their record keeping for centuries, since before anyone had heard of Edward Tufte.

Purpose: In this article, three Indigenous evaluators (Mohican/Munsee, Cherokee, and Tlingit), along with a non-Indigenous co-conspirator, discuss their journeys creating space to weave together Western notions of data visualization best practices and Indigenous ways of knowing

and storytelling. The authors, who focus their evaluative work on the support of Indigenous communities, reflect on what has worked in communicating data, what has not, and how far data visualization has yet to go in all four directions.

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Framing Our Contributions Through the Four Directions of the Medicine Wheel

In this issue of the *Journal of MultiDisciplinary Evaluation*, the editors ask those of us publishing in the first part of the issue to address decolonization as it has affected theory, tools, and frameworks. The use of an Indigenous Medicine Wheel to decolonize and frame research and evaluation studies is nothing new (Marsh et al., 2015; Jenkins et al., 2015 Atlantic Council for International Cooperation, 2017). Use of Indigenous theories, methods, and frameworks is part of a larger body of global academic Indigenous literature (Kovach, 2010; Chilisa, 2019; Smith, 2021) that is available to anyone who has the academic and cultural integrity and ethics and the work ethic to look for it. Since contact began, Western ways of knowing, doing, and being have devastated and traumatized Indigenous peoples, First Nations peoples, and the nonhuman Relatives on this planet (Bowman-Farrell, 2019). Thus, as part of this issue's call to decolonize by focusing our immediate attention toward addressing the current, past, and future concerns of our time, we put forward our urgent call to decolonize the way we theorize, operationalize, and produce meaning through text and visualization when conducting evaluation or research studies.

In this spirit of our Ancestors and in solidarity with our allies and Relatives, we offer the Medicine Wheel framing as a way to make evaluation and research Wuliit Wchapiikal, or Good Medicine (Bremner & Bowman, 2021). We view this article as part of our ongoing effort to be on a healing and transformative pathway that is sustainable and honorable as we become more visible in academia and reclaim the space of which Indigenous people originally took care.

By using a precontact framework, the Lunaape Medicine Wheel, as a way to bring forward our Original teachings and look backward to our Original roots, we ground and enhance our knowledge and teachings as we stand in the present, offering perspectives on moving forward (Waalaneekweew, 2018). The Medicine Wheel provides the context and explains the processes of our work to date.

In this article, we enter through the Eastern Door, where we learn how to be a good Relative and how to be in good relations (with each other and our world). Next, we travel to and through the Southern Door where we reflect on what we have to overcome and reevaluate regarding data visualization to “have

a good mind.” After the Southern Door and the examination of what we think we know, we pass through the Western Door, where we reflect internally and recenter ourselves so that we can “do the good work.” Lastly, we move forward through the Northern Door, where we strive to be on a “good journey” or the correct path, where we enact the lessons we have learned through reflection, exploration, and examination.

This framework not only guides this article, but also has guided our work together as evaluators and researchers from different ethnic, academic, and lived experiences. When we came together as authors, we spent time learning from each other and building relationships. Even with a shared Indigenous background, we acknowledge we are not pan-Indigenous and have our own unique traditions and preparations. This coming together was akin to an academic lodge, with a shared understanding and consensus-building at the heart of the process. The process allowed us to weave together our different perspectives and experiences to shape this article (in addition to multiple presentations) in a manner that represented and honored the wisdom each of us held on the topic of data visualization in evaluation.

Just as we asked ourselves reflection questions in the development of this content, we now encourage readers also to reflect on the following questions: What statements of values and importance are embedded in the visuals you choose and create? How do the books you read, presentations you attend, social media you follow, and colleagues you talk to shape your perceptions and choices about data visualization? How is your data visualization adding to or dismantling colonization? We also include, at the end of each directional door section, a reflective question to encourage active engagement and assist in broadening readers' perspectives on data visualization.

Introduction: The Eastern Door—Being a Good Relative

We begin our article with the Eastern Door. The Eastern Door represents being in good relations within ourselves and with each other. To engage in and carry out the work, it is important to come rested and ready to do the work and to cocreate information from a place of rest and in relation with all things that affect the work we put forward: physical, mental, spiritual, and emotional. The Eastern Door also reminds us of the importance of representing community context, cultural content, and language, and to honor diverse ways of

thinking and being as the lived experience of the contributors and the pathways they have traveled to get here. We start the article by detailing how colonization is the opposite of being in good relations and disregards the basic tenet of the Eastern Door, which is to honor diversity of thought

and include examples of data visualization that do not fit the existing dominant paradigm generally defined by cis white men of European descent. To start in a good way, we offer a prayer to the Eastern Direction:

ᏊᏍᏗᏰᏍᏗ (DiKaLvGv) Eastern Direction

From the appearing way Merciful Creator,
Thank you for the Sun which purifies.
It brings light into the world, enlightenment into
the darkness, and understanding to the ignorant.
Help us to be the bearers of your light.

A Cherokee Prayer to the Seven Directions
provided by Mark Parman of the Cherokee Nation

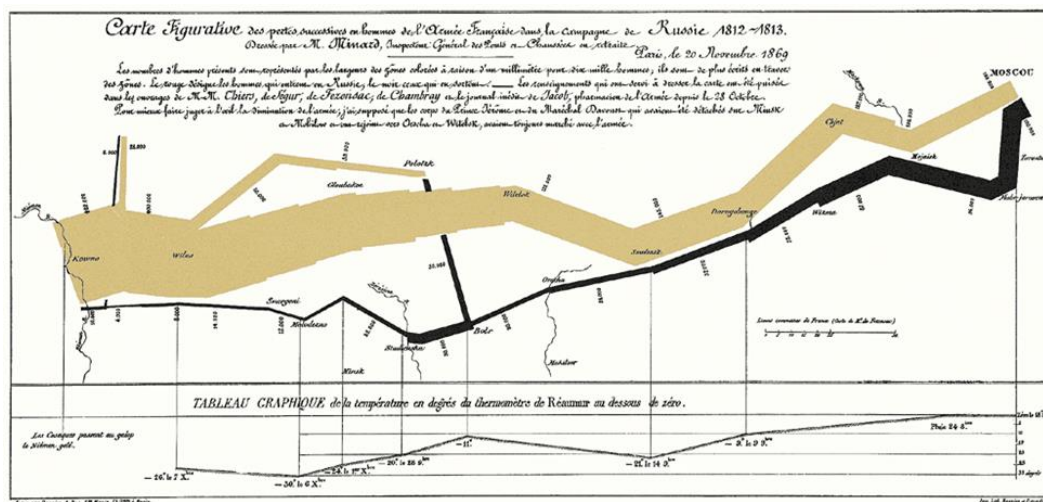
Data visualization is a visual representation of quantitative or qualitative data. The strength of this definition is that it is so broad, many things fit under its umbrella. But perhaps that is also its weakness: it leaves what counts as data visualization open to interpretation, and this is where the problem lies.

People with power and privilege are the ones who are able to communicate their interpretations about what is in and what is out; what counts as data visualization and what does not. The history of data visualization (and evaluation and often history

more generally) is written by cis white men. History is upheld by them, too, even among the data visualization crowd of today, who cull lists of historically important figures and decide whose stories will be remembered, whose work will become “foundational.”

The accounting of data visualization history is rooted in Europeans and their wars. Take, for example, Figure 1, Charles Minard’s 1869 alluvial diagram of Napoleon’s march on Moscow, a historical data visualization so well known that it is often framed on office walls.

Figure 1. Minard’s Data Visualization of Napoleon’s 1812 March on Moscow



Note. From *Tableaux Graphiques et Cartes Figuratives de M. Minard, 1845–1869*. Item 28 in a portfolio of Minard’s statistical maps at the Bibliothèque de l’École Nationale des Ponts et Chaussées, Paris.

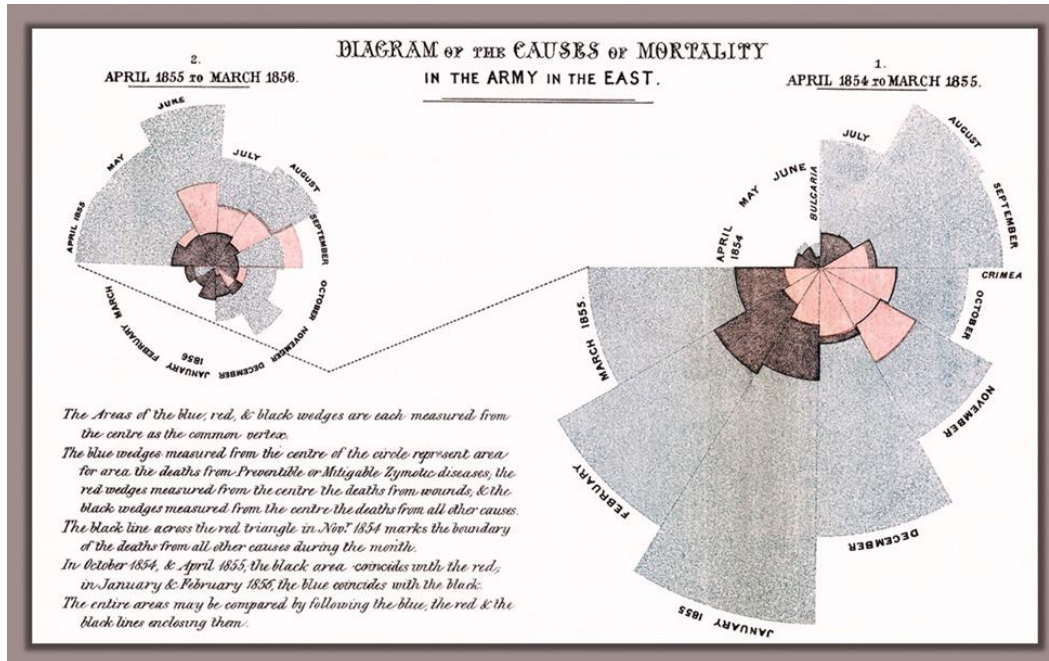
This visualization depicts the movement of soldiers across land, where the band’s width

represents the number of soldiers alive at the time. The band narrows as the army moves toward

Moscow, on the right, and shrinks even more as they return. The return trip is marked by the black band.

Figure 2 represents another well-known data visualization: Florence Nightingale's 1859 coxcomb graph depicting soldier deaths in the Crimean War.

Figure 2. Nightingale's Coxcomb on Soldier Deaths in the Crimean War

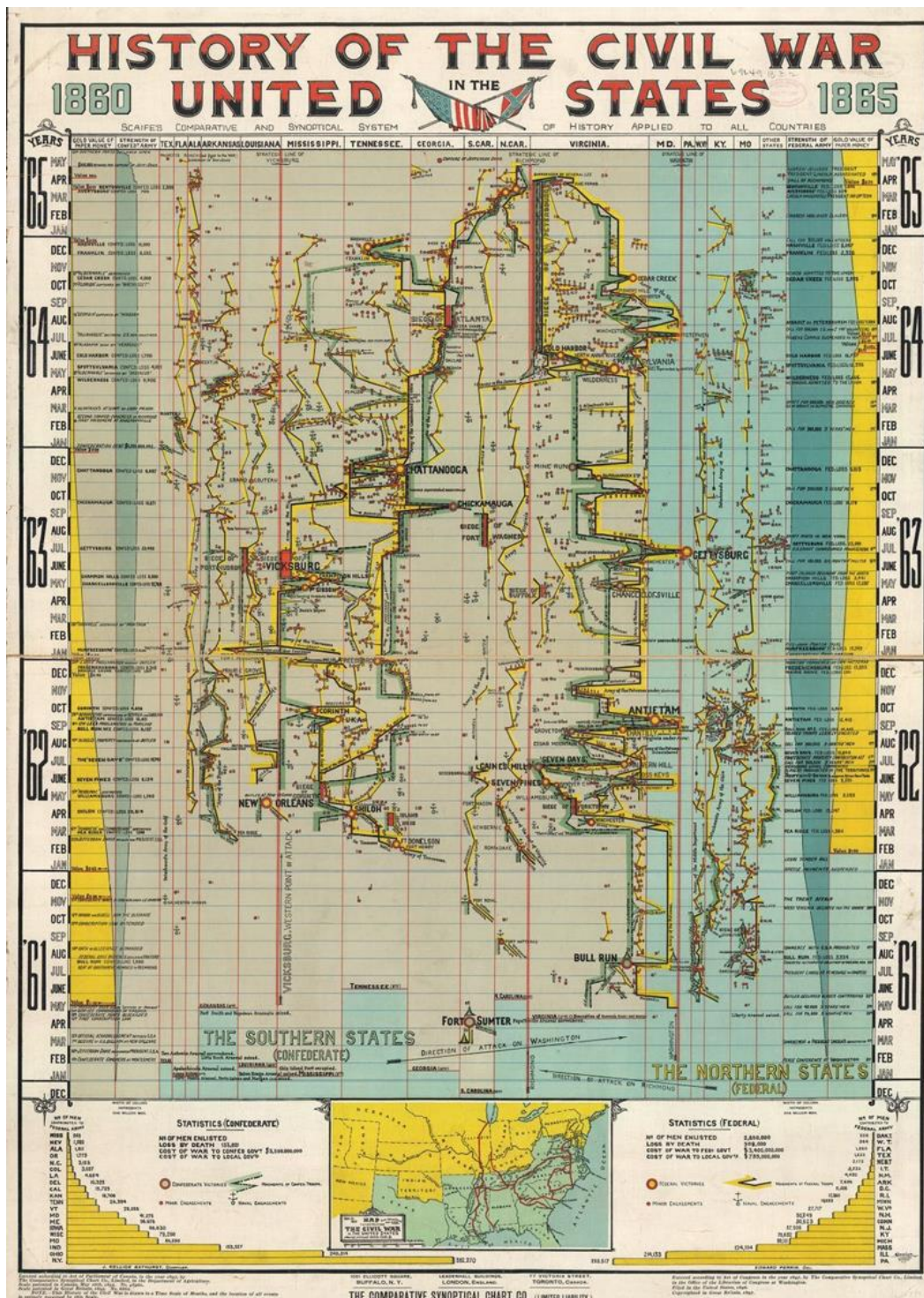


Note. From *Data Visualization and the modern imagination* by R. J. Andrews and the David Rumsey Map Center, 2020, Stanford University (<https://exhibits.stanford.edu/dataviz>).

Nightingale used this chart to demonstrate that many of the deaths from the war were not caused by activity on the battlefield (the red wedges) but resulted from subsequent maladies incurred during stays at the hospital (the blue wedges).

Figure 3 shows a visualization by Scaife (1897), graphing the history of the United States Civil War. The graph marks the movement of soldiers in space and time over the course of the war.

Figure 3. Scaife's Timeline of the History of the Civil War in the United States



Note. From *Data Visualization and the modern imagination* by R. J. Andrews and the David Rumsey Map Center, 2020, Stanford University (<https://exhibits.stanford.edu/dataviz>).

The framing of data visualization's history, as with so much of history, is Eurocentric in view and

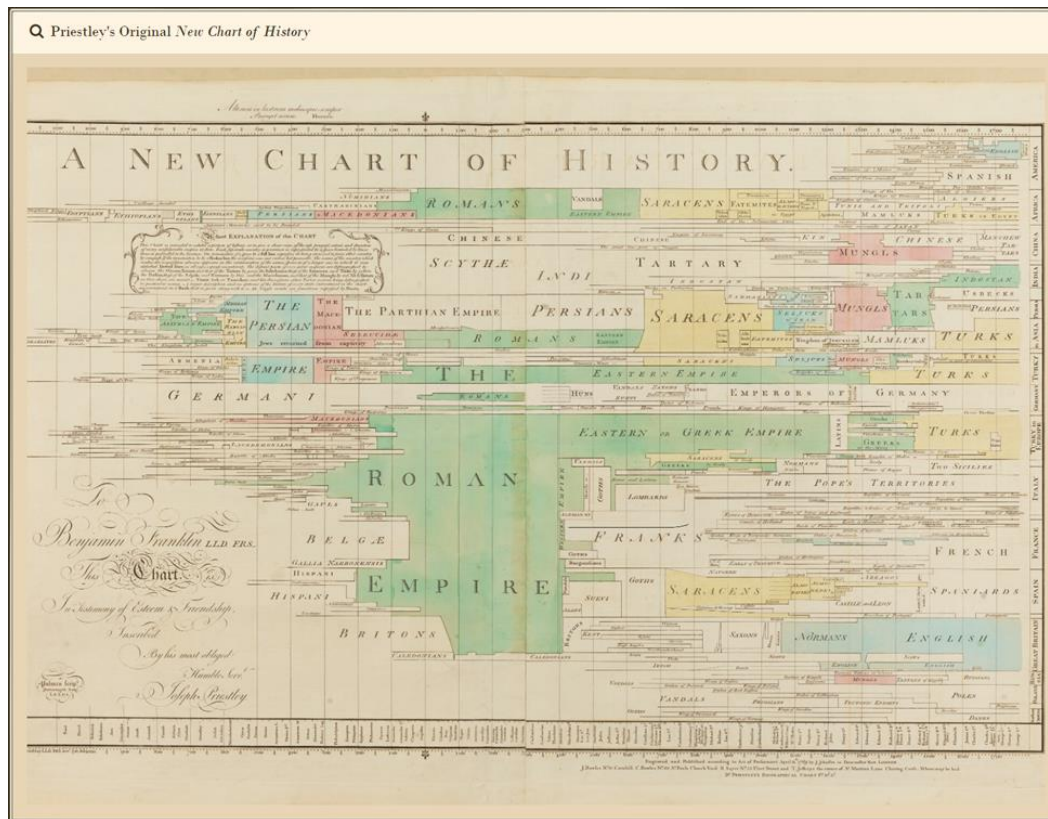
rooted in conquest. The three previous examples—and many more along this same theme—were part

of a 2019 gallery of historical visualizations at Stanford University, curated by a white male data visualization scholar. The collection reinforced a position that data visualization as a field originated during the Enlightenment, born from European roots in the 17th and 18th centuries. The curator said as much in his introduction to the exhibit: “Data visualization leapt from its Enlightenment origins

and into the minds of the general public in the 1760s” (Andrews, 2020). Modern-day leaders in data visualization continue to uphold this version of history.

Figure 4 is another example from that collection, a “new chart of history” made by a European white man.

Figure 4. Priestley's *A New Chart of History*



Note. From *Data Visualization and the modern imagination* by R. J. Andrews and the David Rumsey Map Center, 2020, Stanford University (<https://exhibits.stanford.edu/dataviz>).

It is hard to see, what with its being dwarfed by the size of the Roman Empire, but America is at the top of this graph, and its roots barely extend past 1300 Common Era, erasing the presence of Indigenous peoples who were the Original caretakers of the land. Just as this was Priestley's way of defining what counts as history, the collection of historical data visualization is a way of writing data visualization history that omits many people, specifically people in Indigenous nations.

In 2021, Harvard University Press published a book, *A History of Data Visualization and Graphic Communication* (Friendly & Wainer), on the history of data visualization, which also claims that

the beginnings of graph communication were in the mid-17th century, invented by a white European man. The book's description says

Michael Friendly and Howard Wainer take us back to the beginnings of graphic communication in the mid-seventeenth century, when the Dutch cartographer Michael Florent van Langren created the first chart of statistical data, which showed estimates of the distance from Rome to Toledo. (Friendly, 2021)

Azzam et al. published a chapter in a 2013 *New Directions in Evaluation* issue on data visualization

that outlines the history of the topic. While the authors note the work of early Egyptians (as a whole) using coordinates and lattice systems for mapping, they pinpoint a specific white man with the creation of the first map in 150 CE and then pick up where the previous citations have, crediting European men for the development of the field.

This framing of data visualization as a movement born from white people in Europe between 1700 and 1800 CE erases the traditions and current practices of Indigenous people around the world and is the very definition and description of colonization of data visualization. This is not all that data visualization can be or is meant to be or has been. As we move from the Eastern Door to the Southern Door, we reflect on what “having a good mind” means and how that brings forward examples of data visualization methods from precontact that were previously disregarded.

Reflection question for the Eastern Door: How do culture and context influence data visualization?

The Southern Door—Having a Good Mind

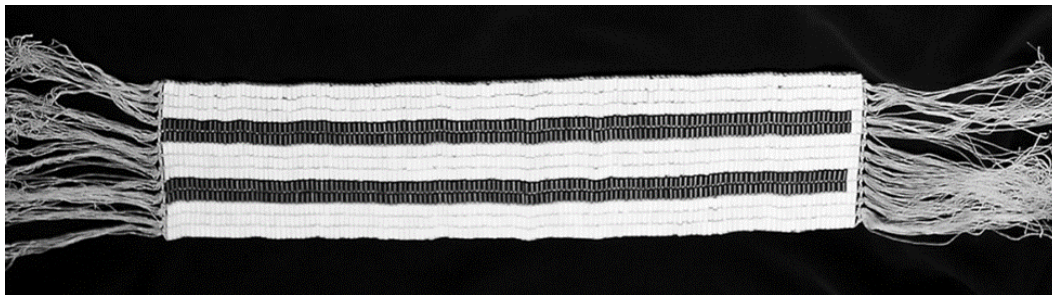
Next, we pass through the Southern Door, with the awakening, rooting, and centering of precontact and post-contact Indigenous-led and created knowledge. These are treaties, policies, nation-to-nation agreements, and theories that root our work for decolonized data visualization and all the work that the Indigenous authors of this paper engage in

beyond academics. The work of centering of Indigenous Knowledge and theories are essential and guide us in life and work and are not to be thought of separately or only applied in certain areas. Through the Southern Door we also illuminate ways to protect cultural, human, and intellectual property rights of Indigenous scholars and the Tribal Nations and communities of which they are citizens, as well as other humans and nonhumans (e.g., rights of nature) for which and to which they are responsible.

Indigenous nations around the world have incorporated stories (qualitative data) and numbers (quantitative data) into our textiles, fabrics, governments, and ceremonies for as long as we have been in existence. We have used these methods to record agreements and treaties.

One of the most well-known examples of bead-encoded storytelling is the two-row wampum belt. This beaded document features two rows of purple beads against a white background. While at first glance it might simply appear to be a lovely decoration, the two rows were intended to represent two rivers and thus the agreement between the Five Nations of the [Haudenosaunee](#) and the Dutch immigrants to maintain two separate yet supportive ways of life. The document, legally binding, recorded the treaty between the Haudenosaunee and the Dutch in the early 1600s to live harmoniously and without interference in the lives of the other.

Figure 5. Two-Row Wampum Belt



Note. Photo From “A Short Introduction to the Two-Row Wampum,” by T. Keefer, 2014, *Briarpatch Magazine* (<https://briarpatchmagazine.com/articles/view/a-short-introduction-to-the-two-row-wampum>).

The Dutch and other European immigrants later disregarded the legal agreements represented in the Two-Row Wampum Belt Treaty, much as the

Indigenous tradition of tactile data visualization has been disregarded in historical accounts.

Indigenous data visualization can be traced back even further. As early as 1500 CE, Incans were

using knotted cords called khipus [as a form of data visualization](#) (Figure 6).

Figure 6. Knotted Cords Used by Incans to Track Quantitative and Qualitative Data



Note. Khipu in the Museo Machu Picchu, Casa Concha, Cusco. Photo courtesy Wikipedia, https://commons.wikimedia.org/wiki/File:Quipo_in_the_Museo_Machu_Picchu,_Casa_Concha,_Cusco.jpg

The color of the cord, the location and size of the knot, and the way the cords were tied to the primary cord all encoded data. Two-thirds of the khipus known today were used quantitatively (in base 10), to record census data including clan, social rank, occupation, and tax payment. For example, three knots linked together represented 300. The other one-third of known khipus were used qualitatively to record stories (Medrano & Urton, 2018). Families were represented through specific knot structures. Even details such as whether the cord was made from cotton or animal fibers carried data.

Elders and scholars are working together to continue to decode the khipu knots and their meanings. Any documentation of definitions that may have been crafted at the time has been erased, if it ever existed. Yet this partnership to clarify and re-record the language of the khipu has the potential to repeat broken promises over brokered

agreements. The academic scholars collecting and categorizing khipus remain part of the neoliberal tradition in which white people earn tenure and prestige from the intellectual property of Indigenous nations, and their academic institutions (in this case, Harvard) become the physical property owners of that which belongs to the Incans.

Indigenous data visualization is not merely a historical tradition destined to be hung on museum walls and admired by nostalgic visitors. While we work to reclaim our histories, we also incorporate data visualization into our current reporting. In some cases, this can mean more artistic interpretations of a data set. For example, Figure 7, created by the Urban Indian Health Institute (Lucchesi & Echo-Hawk, 2018), shows data about missing and murdered Indigenous women and girls. Various data points are written in sentences, each placed within the ribbons of a ribbon skirt.

Figure 7. Ribbon-Skirt Data Visualization from Urban Indian Health Institute



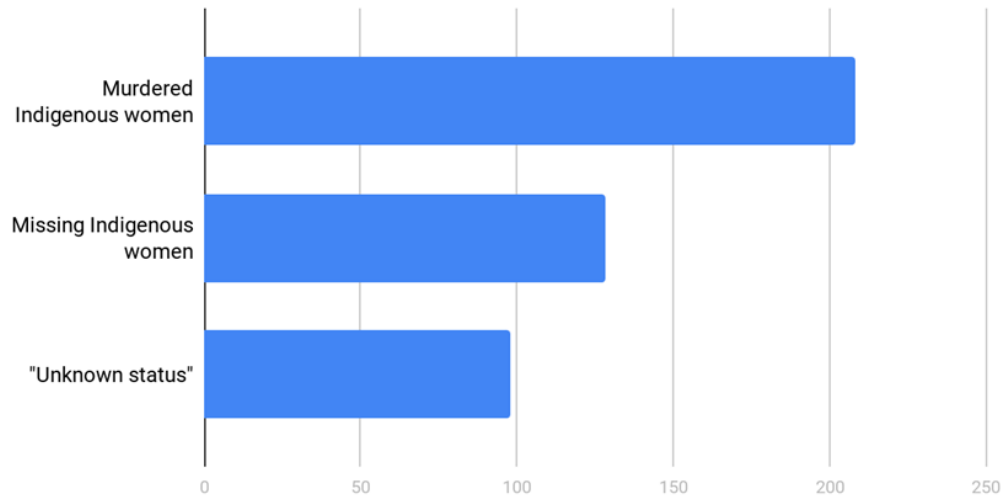
Note. From *Missing and Murdered Indigenous Women & Girls: A Snapshot of Data from 71 Urban Cities in the United States* (p. 7), by A. Lucchesi & A. Echo-Hawk, 2018, Urban Indian Health Institute (<https://www.uihi.org/wp-content/uploads/2018/11/Missing-and-Murdered-Indigenous-Women-and-Girls-Report.pdf>). Copyright 2018 by Urban Indian Health Institute.

Figure 8 represents how the same data would be visualized in a more Western approach. The data are visualized as a bar chart. While this chart is

technically a sound method for showcasing this data, it lacks the cultural representation and humanity present in the original.

Figure 8. A Westernized Approach to Visualizing Data on Missing and Murdered Indigenous Women and Girls.

506 cases of missing and murdered indigenous woman and girls were identified across 71 selected urban cities. Their median age was 29.



Note. Chart created by Dr. Stephanie Evergreen using data from *Missing and murdered indigenous women & girls: A snapshot of data from 71 urban cities in the United States*. By Lucchesi & Echo-Hawk, Urban Indian Health Institute. <https://www.uihi.org/wp-content/uploads/2018/11/Missing-and-Murdered-Indigenous-Women-and-Girls-Report.pdf>.

These two different visualization approaches likely generate different moods, feelings, and reactions. The version developed by the Urban Indian Health Institute is less statistically accurate (in that, for example, the lengths of the ribbons do not correspond to the values placed in each ribbon), yet the design is more personal and memorable than the Western standard bar chart. The ribbon-skirt visual evokes emotions unlikely to be elicited by the bar chart. Greater emotional engagement and memory retention lead to increased recognition and recall (Borkin et al., 2016), all of which contribute to more informed decision-making and actions.

Despite the benefits of a visualization style like that from the Urban Indian Health Institute, or the Inkan khipus, or the two-row wampum belt, Indigenous works have not been included in the data visualization canon as legitimate examples of methods and encodings. We advocate for a broader view of data visualization that encompasses Indigenous methods and encourage the respectful exploration of other Indigenous examples that have been erased, hidden, or discounted.

The reflection question for the Southern Door was and is: What theories and methods are utilized for culturally responsive / Indigenous data visualization?

The Western Door—Doing the Good Work

Now we turn our attention and energies to move through the Western Door. The Western Door supports the development of culturally responsive practices and culturally specific strategies (Sul, 2021) used in evaluation and data visualization. It is action-oriented, with applications of our aforementioned theories, methods, frameworks, and other Indigenous components of the Eastern and Southern doors to real world contexts, projects, and practices. It includes examples and insights on what is working, what is not working, and how challenges have served as springboards to Indigenous innovations in data visualization or other evaluation for decolonization activities. The Western Door can also provide a place to share

developmental, impactful, and innovative theories, models, policies, and other strategies.

A Cherokee Example of Doing the Good Work

Article author Mark Parman is a citizen of the Great Cherokee Nation and is employed in the Nation's Community and Cultural Outreach Department. He reports evaluation data on a variety of programs provided by his department to the Cherokee Council, in part to improve the services his department offers and to increase the quality of life of his people. Even though he was born as a Cherokee, Parman has studied the culture extensively to learn more about it, and has gained a deeper understanding of cultural symbols, their meaning, and when to use them. Someone with a different background would need to undergo extensive relationship-building and permission-

seeking prior to incorporating such symbols into their data visualization practices. (However, one still on that journey could potentially champion others, like Parman, who are in a position to use such symbols).

There are three different sovereign Cherokee governments recognized by the United States: the Cherokee Nation, the Eastern Band of Cherokee Indians, and the United Keetoowah Band of Cherokee Indians in Oklahoma. These people share a language, culture, and history braided together through the years, but have separate governments, each standing on its own.

Figure 9 shows the seals of each of the Cherokee sovereign governments. Within Figure 9, the seal labeled 9a represents the Cherokee Nation, 9b is the seal for the Eastern Band of Cherokee Indians, and 9c represents the United Keetoowah Band of Cherokee.

Figure 9. Seals for each of the Cherokee sovereign governments, each containing a seven-pointed star



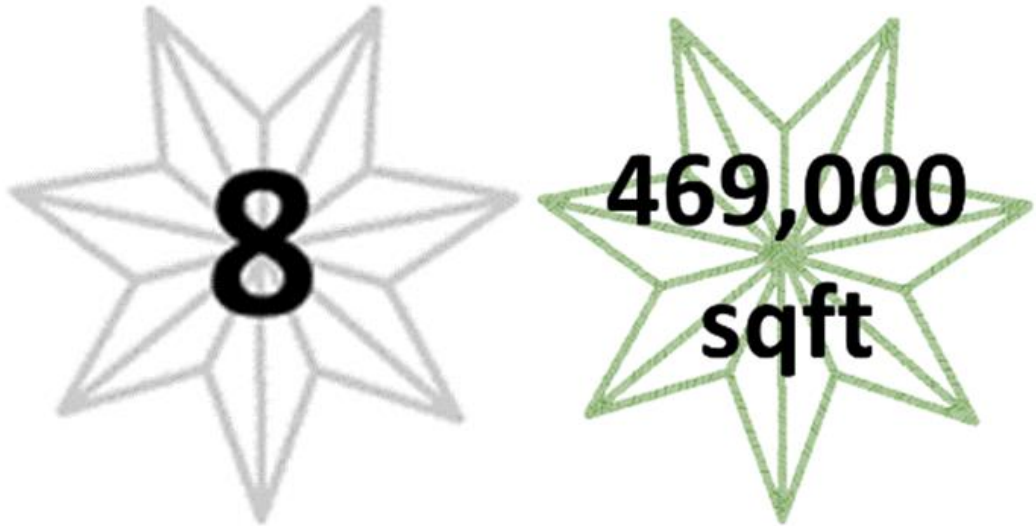
Note. Symbols available from the respective government websites: <https://www.cherokee.org/>, <https://www.cherokee.org/>, and <https://www.ukb-nsn.gov/>.

Each of these seals contains a central seven-pointed star. The number seven is a reoccurring number in Cherokee culture. For example, there are seven Clans and seven cardinal directions.

In reporting to the Cherokee Council, Parman uses the seven-pointed star to emphasize data points that pertain to national programs. Figure 10 shows a simple example of how the star is incorporated into the communication of data about the Cherokee health care system. The Cherokee

Nation operates eight health care facilities that encompass a total footprint of 469,000 square feet. Parman placed those two key data points on top of two different seven-pointed stars in the figures below to illustrate and assist in visualization of the information about the size and number of the facilities. Superimposing the data on top of the Cherokee-influenced seven-pointed stars makes a connection between the culture and the data or information being presented in a report.

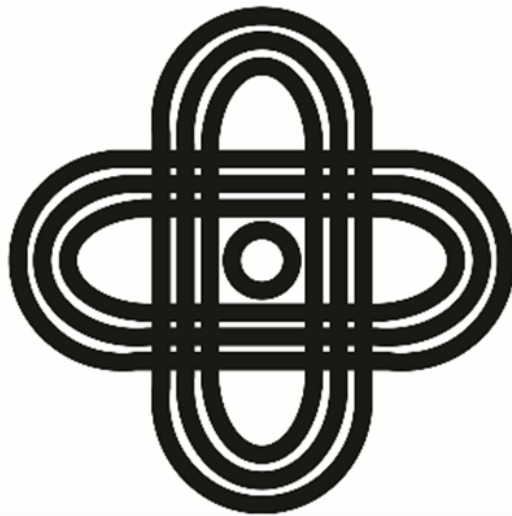
Figure 10. Cherokee Data Visualization Integrating Seven-Pointed Stars



Iconography or symbology can be blended with data points as a form of indigenous data

visualization. Another commonly used Cherokee design element is shown in Figure 11.

Figure 11. Cherokee Symbol Depicting All Seven Directions and Often Used to Represent Fire

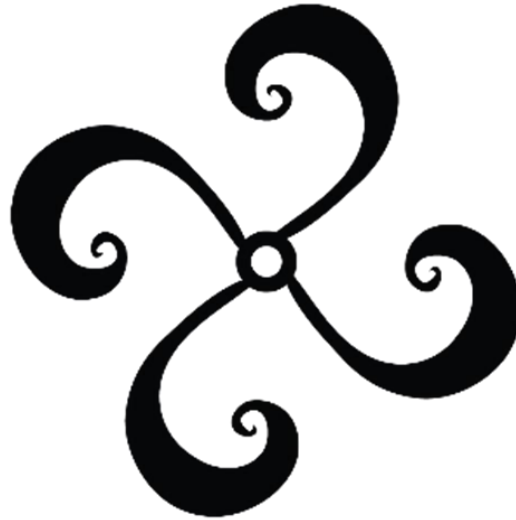


This design has been applied on pottery since around the year 1000 of the Common Era. It has many meanings and holds them all at the same time. The design represents the seven cardinal directions of the Cherokee universe: North, South, East, West, Above, Below, and Within. It also depicts the Central Fire of a community. It is the

Council House Fire, the Ceremonial Ground Fire, and the Home Fire all at the same time. Because of these meanings, this design lends itself to highlighting data related to activities, programs, and events within the community and family.

Figure 12 is the ancient Cherokee symbol for water as well as smoke.

Figure 12. Cherokee Symbol for Water and Smoke



When associated with water, this iconography lends itself to reporting data related to environmental programs and issues. When

associated with smoke, it can be combined with Figure 11 to form a Council or Ceremonial fire with smoke rising up, as shown in Figure 13.

Figure 13. Cherokee Iconography Combining Two Symbols



Numerous designs found on historical Cherokee pottery can be used for data visualizations. For example, the sport of chunky originated around 600 CE and was a very common game. Figure 14 is a representation of the game. It

features a player wearing a shell gorget like those used in the Mississippian period. This symbol can be used to highlight data from a wellness program or after-school activities.

Figure 14. Iconography Featuring a Cherokee Game and Gorget



Figure 15 shows another example of combining symbols to create larger representations that can be used as backdrops for communicating data points,

as in Figure 10. This image combines a stickball player with the seven-pointed star to focus audience attention on Cherokee warriors.

Figure 15. Warrior Symbology Combining Sports Player with Seven-Pointed Star



Figure 16 contains an image of Sequoyah, the Cherokee citizen who developed the written Cherokee language system. The system led to nearly universal literacy rates among the Nation and influenced other written language systems around

the world. In Figure 16, the image of Sequoyah is overlaid with examples from the Cherokee syllabary to remind us of the Cherokee commitment to education throughout history.

Figure 16. Cherokee Imagery Used to Represent a Historical Commitment to Education and Literacy



These Cherokee-informed figures adapted by Parman are examples of “good work” by Indigenous evaluators that ensure they are representing data in ways developed by and for Indigenous people. Evaluator Mark Parman represents data in a manner that resonates with the client and culture he is representing and to whom he is reporting. Though Parman’s designs might not be recognized as data visualization to many with Western definitions, they have cultural relevancy and personalization that make them more likely to engage Parman’s particular audiences than any Westernized data visualization would be.

As an example of expanding the notion of data visualization to include multiple perspectives and notions of data visualization, we offer the example of a participant, Sana Ahmed Wilder, who attended a presentation the four of us made. Immediately following the presentation, Wilder went on to write about her new recognition of her own Punjabi culture’s embroidery traditions as ways of encoding data. Wilder writes that the color of the thread carries meaning, the shapes created by the embroidery often represent social relationships such as marriage, and “in some instances, the total stitch count was the number of grains donated during that season’s harvest” (Wilder, 2022). Data visualization is a part of Indigenous history. Broadening perspectives and the way in which data is presented is critically important. Decolonizing data visualization makes data accessible and relatable.

One might ask, “Is it ok that I, as a non-Indigenous evaluator, utilize and incorporate these ideas that are unique to an Indigenous population into my own work?” In short, it depends. Before making the decision to “Indigenize” data visualizations, there are several questions one needs to ponder. Ask yourself why. What is the reason for wanting to use symbols from this particular culture? How will using this symbol help the reader understand the data more clearly? Is this symbol used by the culture you are working with, and if so, how? Do you need permission to use this symbol? Do you want to use the symbols simply because you like them? Because you want to drive home a point about a program a particular Nation is providing? How you answer these questions will direct your path to decolonize your data visualization.

Reflection question for the Western Door: How does data visualization become a colonized tool when Western theories, methods, and strategies are used?

The Northern Door—Being on a Good Journey

We now travel through the Northern Door. In this direction, we use the wisdom of our Ancestors and Elders to ground ourselves and our work in traditional knowledge as a way to celebrate traditional knowledge and/or to reflect on and unpack the learnings we receive from challenges,

restarts, and letting go of things not working. Validity, value, and celebrating the lived experience and praxis of evaluators and those involved in evaluations and data visualizations have real meaning and usefulness. These are the Indigenous-evidence-informed and -grounded pathways. They will help future generations walk on sacred pathways for innovative and sustainable Indigenous data visualization and other evaluation strategies that enlighten Western partners and allies but also inspire and affirm how to be a Good Relative doing Good Medicine in evaluation for the next seven generations. This may include traditional ways of sense-making, discussion, and analysis, reflecting on and differentiating what “wisdom” is (our Elders’ way) versus simply the production of more knowledge (Western ways). It may also consider how to come full circle to address the other doors, so that the authors and readers make these important connections as part of something bigger than themselves.

In practice, we have experienced Western evaluators who express excitement about mimicking Indigenous designs, like the ribbon skirt example above. Yet few Western evaluators have changed the way they practice evaluation to decolonize their work. The neoliberal tradition of appearing “diverse” on paper without fundamentally uprooting Western evaluation practices is not Indigenous data visualization. Part of this effort to decolonize data visualization is in reshaping how we work together to produce the data in the first place.

Reflection Question for the Northern Door: What learnings and wisdom can we share to help the field evolve regarding Indigenous and culturally responsive data visualization strategies?

Conclusion

To decolonize, we must first pause and ask ourselves why. Why do we want to be involved in decolonizing data visualization in the first place? The process of decolonization begins with the self in an examination of one’s own positionality: acknowledging our whole (holistic) selves and that we do not leave ourselves and our experiences at the door when we do the work. Examining our positionality can also help us understand our own worldview and how it influences that which we choose to research, evaluate, and engage (Foote & Bartell, 2011; Savin-Baden & Major, 2013; Holmes, 2020). Examination of the self and our positionality is a first step, not a last step.

It is also important to ask oneself whether the motivation to decolonize is coming from a place of liberation and a reclamation of Indigenous intellectual property, or from a desire to join the latest trends in diversity, equity, and inclusion. It is important to ask ourselves who will benefit from a specifically Indigenous form of data visualization. If the answer is not the community one is representing, then more reflection might be in order. Other questions for evaluators and researchers and those working with populations that are not represented broadly in society are: What is your history with engagement in decolonization efforts? Particularly for white people: do I have permission to engage with cultural content that is not mine? It is important to ask for permission from the cultural group from which you obtained the images and/or information before using the data or images in your report.

When only white men decide what counts (and does not count) in terms of data, and what counts (and does not count) as data visualization, and what counts (and does not count) as data visualization history, they are actively gaslighting Black and Brown people about their legacy as data visualizers. Yet the risk of advocating for increased acknowledgment of Indigenous data visualization is that white people might continue the legacy of colonization and co-opt intellectual property, strip context and tradition, and appropriate. We offer this grounding in positionality and the orientation toward the four directions as steps toward handling this tension, in the hope that by promoting Indigenous data visualization, we may ultimately contribute to its decolonization.

Decolonizing data visualization is not simply about learning a different graph type. Rather, it is learning a way of being and coming together; learning from each other; and learning how to make/create space for other ways of gathering, synthesizing, and representing information and data. When we shine a light on Indigenous data visualization, we are intentionally saying that the circle is much wider and that there is room for everyone in the lodge.

We thank you for joining us in the walk through the doors of the Medicine Wheel framework, as we end this journey together. In Cherokee cosmology, there are seven directions. Beyond the four directions we discussed here, Cherokee also includes Within, Down, and Up. To close this article, we offer the end of the Cherokee Morning Prayer, a medicine prayer. Medicine, in this sense, is anything that makes one a better person. It has no English translation, as it is a direct communication to the Creator of All Things. We

offer it to you in hopes that it will bring peace, enlightenment, and joy into your life.

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From the uppermost way, Creator of the highest,
Wi hi yo Ya wi hi ya We he yah Ya wi hi yu
ᑭᑦᑭᑦ ᑭᑦᑭᑦ ᑭᑦᑭᑦ ᑭᑦᑭᑦ

*We dedicate this article as a written prayer
to the missing and murdered Indigenous women and girls.*

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