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Yes, Yes in Yellow: Memes and What They Tell Us About (Queer) Use of Data Visualization

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Yes, Yes in Yellow: Memes and What They Tell Us About (Queer) Use of Data Visualization

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Data visualizations are used by an increasing number of people for a wide variety of purposes. Yet, existing literature on data visualizations is dominated by only a narrow set of uses (typically: analysis and communication). Drawing on queer and feminist theory, I argue that Sara Ahmed's conception of "queer use" is applicable to the visualization context, and provides a means to talk about the landscape of visualization use beyond those historically focused. Then, as a demonstration of this lens, I demonstrate how framing visualization memes as queerly used visualizations can offer new opportunities to study the rhythm in which visualizations are read. I conclude with an invitation to examine queer use of visualizations further by summarizing three other queer uses of visualization that may be fruitful to explore more fully in the future.

CCS Concepts: • **Human-centered computing → Visualization theory, concepts and paradigms**.

Additional Key Words and Phrases: Visualization, Queer use, Normative use, Memes

1 INTRODUCTION

When data visualization researchers write about how visualizations are used, a narrow set of uses dominate the conversation. In work by Lam et al. and Isenberg et al. about how visualizations are empirically evaluated, the authors' taxonomy of evaluation goals includes only three about how (effectively) visualizations are used "Evaluating Visual Data Analysis and Reasoning," "Evaluating Communication through Visualization," and "Evaluating Collaborative Data Analysis" [17, 24]. In other work, such as that by Kosara, the main uses of analysis and communication are joined by a third: exploration [23].

However, visualizations may be used in far more ways than the body of research has historically focused on. While the visualization literature is dominated by a focus on a few core uses, there are also examples of alternative practices. For example, Thudt et al. and Carpendale et al. have explored the use of visualizations for personal reflection and storytelling [9, 38, 39] and Bressa et al. cataloged the design space of "input visualizations" which are used to "collect and/or modify new data rather than encode pre-existing datasets" [6]. These examples, among others, highlight the expansiveness of possible visualization uses.

Considering how a visualization will be used is an important component of visualization design because techniques which are helpful for one use may be detrimental for another. For instance, titles which explicitly describe a takeaway message may be desirable when used for communication because they can decrease mental load and increase assessments of aesthetics. However, they may also sway interpretations of what a visualization shows in ways that may hinder effective analytical thinking and thus may be undesirable for visualizations used for analysis [21, 42].

Further, how a visualization will be used is central to some definitions of what is or is not a visualization. When I introduce undergraduate students to visualizations, I often use a very broad definition: "data visualizations are a consistent mapping between data values and visual components." While this definition effectively encourages students to think about the relationship between data and visual representation, it also *includes* some artifacts which are typically not considered data visualizations in research. Other, more specific, definitions of visualization explicitly employ use. One example of this is the definition present in Munzner's influential textbook, where visualizations are described to be "designed to help people carry out tasks more effectively" [31].

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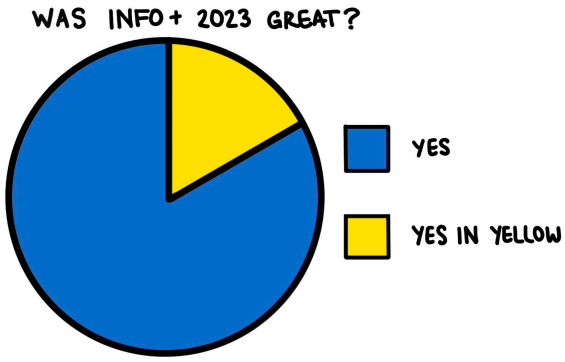


Fig. 1. Visualization memes, like the one pictured here, are an example of queer use of visualization. Studying queer use (including these memes) can offer new opportunities to learn about visualizations as a medium.

If use is a central component of how we talk about and design visualizations, then may be helpful to have language to more precisely discuss its landscape. Namely, there is a need for language to distinguish between the uses of visualization which have been historically recognized as valid and worth studying (i.e., the "normative" uses) and those which deviate from this norm. For this, we can turn to the field of Queer Theory for inspiration. Since the 1990s, the field of Queer Theory has used the term "queer" to refer to practices which are positioned in opposition to "normative" or dominant practices [43]. While queer theory is often concerned with studies of gender and sexuality, the application of queer theories to other topics is widely practiced (e.g., geography [7], interviewing methodology [22], educational policy [28]). Though diverse, these academic pursuits are unified by the act of critically thinking about, and honoring, ways of knowing and doing outside of norm.

In this paper, I will draw from queer theory and extend Sarah Ahmed's definition of "queer use" to the context of data visualization. By doing so, I aim to provide a means of situating uses which have been historically legitimized by the visualization literature against those which falls outside of this norm, but are nonetheless valid and worth studying. Then, I will demonstrate how using this definition of queer use can be used to frame visualization memes (such as the one pictured in Figure 1) as one example of a visualization used queerly, and how doing so offers a new way to study how visualizations are read. This meme case study contributes a new, novel example to the existing body of queer uses of visualization. Finally, I will conclude with an invitation to further explore queer use of visualizations by presenting three other queer uses that I think may be fruitful to explore more deeply in the literature: visualizations for forming barriers, data collection, and play.

2 QUEER USE

In *What's the Use?*, Sara Ahmed provides an instructive definition for, and meditation on, "queer" use. In it, Ahmed says that queer use refers to "how things can be used in ways other than for which they were intended or by those other than for whom they were intended." [2]. Here, Ahmed is using "intended" not to refer to only the purpose of the thing as its creator might have imagined, but also the way it might be expected to be used culturally – its "normative" use. For instance, while a kitchen pot may be intended to be used to cook food, it may also be used as a helmet when a child places it on their head or used as a storage container when pantry items are placed inside of it in a cabinet. In this

case, “used to cook food” is the pot’s intended or normative use, while “worn as a helmet” or “used to store items” are examples of queer uses of the pot.

Precisely defining what is or is not broadly normative is difficult because it is culturally constructed and therefore context dependent. However, normative behaviors are set and reinforced by dominant power structures, which define which ways of knowing, being, or doing are acceptable. For a specific circumstance, may be helpful to think of the division between normative and non-normative as either a spectrum (e.g., as in Foucault’s conception of normativity as a way of classifying relationships with respect to a perceived “normal” center [12, 13]) or as a fuzzy set (i.e., where some items are identifiably inside or outside of the set and others fall in the fuzzy space in between), rather than a strong binary.

Applying Ahmed’s definition to data visualization, we can then say that **queer use of data visualization** is when a visualization is used for a purpose other than what it was intended or used by someone other than for whom it was intended. By this definition, we could, for example, consider COVID-skeptics’ use of data visualizations produced by scientific or governmental organizations to argue against COVID precautions (such as studied in Lee et al’s work [25]) to be queer use. Here, the visualizations are neither used by the people intended nor for the purpose intended by the data collectors or visualization authors. Additionally, if we think of the notion of the “intended" as referencing culturally normative uses (rather than a specific creator’s intent), then we can see that this definition could encompass many prospective uses and audiences.

As with the general case, it is difficult to precisely and completely define which uses of visualization are normative (and thus which are queer), but we can lean on prominence within established visualization literature as a proxy of which uses are most dominant. By this measure, normative uses include analytics, communication, and reasoning. On the other hand, examples of queer uses which have infrequently appeared in the literature include personal reflection and reminiscing (e.g., [38]) and input visualizations when used to modify existing sets (e.g., [6]). If we consider normativity to be a spectrum or a fuzzy set, then there are also uses which fall in a fuzzy gray area. One substantial example which falls into this group is data art. On one hand, artistic uses of visualization (i.e., aesthetic pleasure or enjoyment [8, 16]) are not often recognized as a central goal of visualization, which would suggest that it is a queer use. On the other hand, the annual VIS Arts Program which runs alongside the premier IEEE VIS conference provides data art substantial institutional legitimacy, suggesting that it is normative. Rather than try to strongly label every use as either normative or queer, uses which appear to fall into the fuzzy in-between remind us that these labels are ultimately a way of describing different kinds of relationship to power which are both mutable and open to interpretation based on the position of the viewer.

3 CASE STUDY: VISUALIZATION MEMES AS AN EXAMPLE OF QUEER USE

Queer use is important to examine because it can highlight interesting or unusual features which might be missed when focusing on normative uses alone. In a lecture on queer use, Ahmed argued that: “Queer uses ... still reference the qualities of a thing; queer uses may linger on those qualities, rendering them all the more lively” [1]. For instance, she highlights the ways that house keys, when queerly used to entertain young children, highlight their sound and shininess. To demonstrate this principle, in this section, I will present visualization memes as an example of queer use of visualization which has not yet appeared in the literature, and argue that viewing these artifacts in this way highlights both the way that visualizations are read (i.e., the delay between initially viewing a visualization, perceiving its parts, and finally decoding a message). By doing so, I aim to contribute to the space of queer uses and demonstrate

how queer use can be used as a lens to expand what artifacts may be considered visualizations and thus open up new means to understand the qualities of visualizations as a whole.

3.1 What are Memes?

Internet memes are digital artifacts which share some common characteristics and are created, shared, or modified by many people on the internet [10, 36]. Internet memes may take many forms such as images, videos, or sounds, though in this section I will focus on only image-based memes which use visualizations, such as the ones in Figures 2 and 3. For brevity, I will refer to "internet memes" as "memes" for the remainder of this paper, though it is worth noting that the term "meme" can refer to a much broader suite of concepts [36].

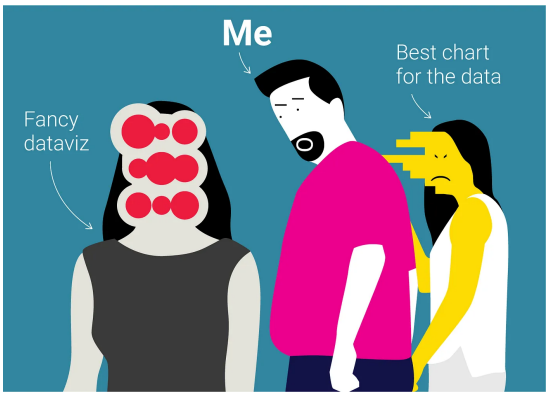
Fig. 2. Each meme is composed of 3 parts: content, form, and stance. In this meme, the "content" of the meme is the message that people spend much more time looking for something to watch on Netflix than actually watching it; its "form" is a pie chart with two sections; and its "stance" communicates an ironic view on its message. Meme by BoredPanda.com [4]

In Shifman's influential book on internet memes, they describe memes as composed of three parts: content, form, and stance [36]. The **content** of a meme is the idea and ideology being communicated through the meme. For instance, the content of the meme in Figure 2 is the idea that people who watch Netflix spend much more time looking for a movie than actually watching it. Next, the **form** of a meme is the "physical incarnation" of that idea [36]. In Figure 2, the form is an image of a pie chart with two sections: a very small section representing the "Time spent watching [a] movie" and a very large section representing the "Time spent looking for [a] movie." Finally, the **stance** is the position of the author of the meme with respect to the idea that they are communicating. Stance can be further broken down into components such as messaging about who gets to communicate and how, the tone of communication, and the purpose of the communication [36]. The stance of a meme is often quite complex. On one hand, the meme in Figure 2 communicates a tone of irony: the reader knows that Netflix is intended for watching movies, so the author feels that it is ironic (and therefore funny) that people spend so much more time searching through options than watching content. The author of the meme also may be trying to normalize this experience – by turning it into a meme, they are reminding the reader that spending a lot of time searching through Netflix is a normal part of using the service.

The content, form, and stance of a meme may change or stay the same as new memes are created, shared, and modified [10, 36]. For instance, we can see that Figures 2 and 3b both show memes with almost identical forms (pie

charts with 2 sections, one very large and one very small) but entirely different content and stances. In fact, one key feature of memes is that they are made with knowledge of, and reference to, an existing meme's structure [36]. Therefore, it may be helpful to distinguish between a single meme and families or collections of similar memes which share content, form, or stance. In this paper, I will use the word "meme" to refer to a specific artifact and "meme group" to refer to a collection of individual memes which are iterations of, or designed in reference to, each other.

There are two ways that visualizations may be integrated into a meme: as the content and as the form. Memes which are communicating ideas *about* visualization have visualization as the content. For instance, Figure 3a depicts a variation of the "Distracted Boyfriend" meme group [20] to communicate a message about visualization designers being distracted by fancy visualization types at the cost of other chart types which better fit the data. On the other hand, memes which use visualizations to communicate an idea about something else have visualizations as the form. For example, Figure 3b depicts a meme with a visualization as the form, where a pie chart is used to tell a joke about the reason that the author updates their apps. For the purpose of this paper, I will focus only on memes with **visualization as the form**. Future work may explore what analyzing memes with visualization as the content may also teach us about the practice of making and using visualizations.



(a) Visualization as the content.
Meme by Xaquín González Veira [41]

(b) Visualization as the form.
Meme by BoredPanda.com [4]

Fig. 3. There are two ways visualizations may be integrated into a meme: as the content (memes *about* visualization such as in 3a), and as the form (memes which show visualizations such as in 3b). In this paper, I focus on memes with visualizations as the form.

3.2 Visualization Memes as Queer Use

Visualization memes are queer use of visualization because they satisfy the definition of visualization which requires data to be converted into a visual form and are not intended to be used in a normative way. For the astrology memes pictured in Figure 4, the data are the author's interpretation of the certainty, timing, and phases that Aries and Libras go through when making decisions. These data have been used to generate fairly normative-looking, annotated line charts that map time to horizontal position and certainty to vertical position of points on a line. Although the line charts look fairly typical, they are not intended to be used in any normative way. Instead, as memes, these images are created to be humorous and build a sense of community [10, 36] – neither of which could be categorized well as normative uses of visualizations.

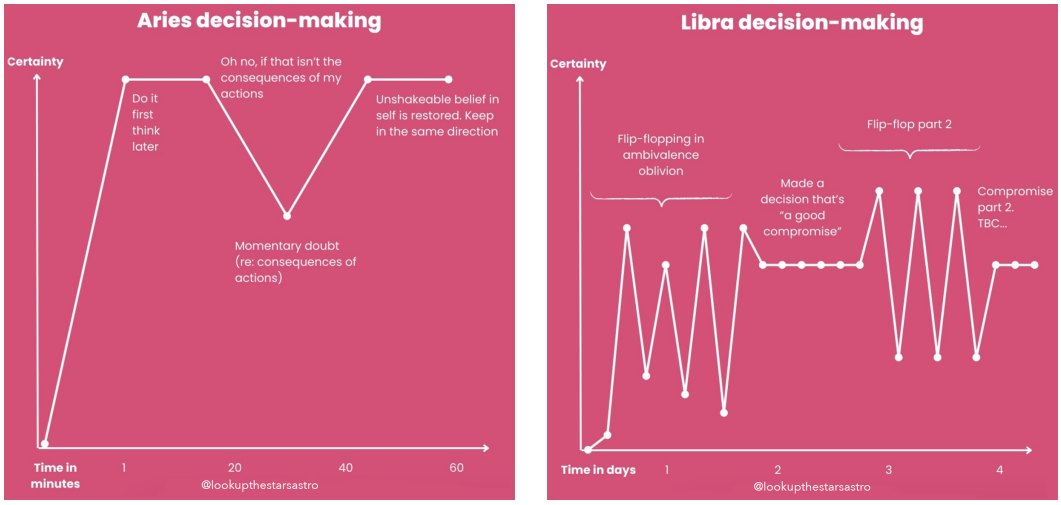


Fig. 4. Visualization memes, such as the ones above, satisfy the definition of visualizations, but they are used queerly. Memes by Instagram user @lookupthestarsastro [26, 27].

One quality of visualizations highlighted by visualization memes is the sequential pattern in which visualizations are read. Making sense of any visualization requires several sense-making loops [34]. For instance, decoding a chart may require connecting several pieces of information from the title, axis labels, and legend before even trying to pull a message from the encoded data itself. The visualization memes highlights this iterative process by exploiting it for ironic humor. The reader of the Netflix pie chart in Figure 2, for example, may first read the title ("Netflix"), then consult the legend, then check out the proportions plotted in the pie chart, before finally putting the pieces together to get the humorous message – people spend much more time looking for things on Netflix than actually watching it. The structure of a sequence of pieces of information put together to inform a humorous message mirrors the set-up and punchline structure used by stand-up comedians [30]. Without the delay between initial information gathering and message comprehension facilitated by the visualization, the humor of the meme is lost.

Studying memes as queerly used visualizations could provide a new way to study the impacts of how visualizations are read. There are many studies within the visualization literature which examine the order in which components of visualizations are read (e.g., [3, 5, 11]). From this work, we know that reading order and speed can have a large impact on comprehension. For instance, there is a body of work which examined how making visualizations more difficult to decode (thus decreasing comprehension speed) impacts how the visualizations are understood (e.g., as analyzed by Hullman et al [14]). Studying visualization memes further may contribute to this line of questioning by providing another means to think about reading order and the impact it has on readers (e.g., how order or design may help or hinder humor; how different components combine and contribute to overall understanding).

4 OPEN QUESTIONS/POSSIBILITIES

In this paper, I explored the idea of "queer use" for visualization. In particular, I presented Sara Ahmed's conception of queer use as how things "can be used in ways other than for which they were intended or by those other than for whom they were intended" [2] and explained how it is applicable to a visualization context. I also presented a case

study of visualization memes in order to contribute to the body of existing examples of queer use and demonstrate how viewing visualization use in this way may offer new paths to insights on new and old problems alike.

One reason that queer uses are important to study is that they often highlight different attributes and features than other (normative) uses. For instance, some queer uses highlight the way that visualizations function as social and rhetorical artifacts completely separate from the data they encode. Take, for example, visualizations like the memes in Figure 2 and 4: it is not entirely clear whether they encode an existing dataset (which has perhaps over-generalized labels) or whether no data exists at all. Irregardless of whether there is any data at all, the visualization still, as an artifact, has a social and cultural impact. This is a similar point to that raised with autographic visualizations, where the directness of the relationship between the phenomena and resulting visual artifact can have a rhetorical function which is entangled with, but ultimately separate from, what is actually shown [32].

While I have focused on memes as an example of queer use in this paper, there are many queer uses of visualizations which warrant further study, such as:

- **Visualizations for forming barriers:** Prior work has found many factors which influence how and when readers engage with visualizations including self-efficacy, personal connection, existing beliefs, and the location of the visualization [18, 33]. While these factors are typically discussed in order to *encourage* engagement, there also may be situations when these factors are used to *discourage* or *prevent* engagement from particular groups of people who do not have the confidence, time, or skills to overcome the barrier. For instance, the conversion of data into a visualization may pose a literal barrier to access to the data themselves (similar to when health data or government records are stored in hard copies or PDFs, rendering them much more difficult to use [37, 40]). Alternately, the encoding or chart type of a visualization may be selected to be complex or seem intimidating in order to limit the number of people who can (or want to) decode it. Studying the ways that visualizations may be used to form barriers may help us better understand how and why people disengage from visualizations and strategies to encourage the inverse.
- **Visualizations for data collection:** While we often think of visualizations as the output of data collection, they may also function as tools for data collection. Recent work on belief elicitation techniques have made great forays into this space (e.g., [15, 19, 29]), but there is certainly more work to be done to understand how visualizations may be used to collect data and how the design of visualizations for this purpose converge and diverge from visualizations used for other purposes. Bressa et al.'s recent survey on techniques in this space highlights the rich design space and broad appeal of this area including tools like visually-augmented spreadsheets which they describe as "very likely the most ubiquitous input visualizations in use today" [6].
- **Visualizations for play:** While the normative uses of visualizations often center work contexts [35], visualizations often also appear in spaces of play and may be particularly interesting to study because they blend normative and queer uses. For instance, there are many board and video games which include visualizations formed by the players through play (e.g., the distribution of cubic "virus" pieces across in the board in Pandemic) or used to communicate the game's state (e.g., health bars in video games) [44]. Visualizations in these contexts may be particularly insightful to study because they blend normative uses (e.g., communication, decision making) with queer ones (e.g., entertainment, immersion in the world of the game). Examining how to balance these two families of uses could produce insightful outcomes for both.

In conclusion, understanding the myriad ways that visualizations are used requires both studying normative and queer uses of visualizations. Though research in visualization has covered a lot of ground, there is much to learn about

how visualizations are used, created, and understood. Expanding the study of queer uses may contribute to this effort and offer new opportunities for holistically understanding visualizations and the people who do (and do not) use them.

5 INFORMATION+ PRESENTATION

This article was presented at the Information+ 2023 conference titled “Yes, Yes in Yellow: Memes and What They Tell Us About (Queer) Use of Data Visualization”.

LICENSE

CONFLICT OF INTEREST

The authors declare that there are no competing interests.

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