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## Feeling numbers

### The emotional impact of proximity techniques in visualization

**Keywords:** data visualization, rhetoric, pathos, emotion

For means of communication, persuasion is a natural and critical part of conveying a message. Data visualizations, being means of communication themselves, are used as rhetorical instruments, but how they persuade has yet to be fully understood. Based on George Campbell's rhetorical theory, this paper presents the results of an empirical study testing the effectiveness of appeals to emotion through proximity techniques—the contextual framing of a visualization. The findings indicate that people feel greater interest towards a topic when the visualized data are more relevant to them, and that data representing events closer in time are more affecting.

#### 1. Introduction

As visual representations of data have become ubiquitous, data visualization has entered public discourse. Beyond knowledge discovery, visualizations are widely used by journalists as a communication tool to convey and support their narratives. Advocacy groups harness digital information displays to persuade by appealing to audiences rationally, credibly, and emotionally (Tactical Technology Collective 2014).

To consider persuasion as a legitimate goal of data visualization, however, is still highly controversial. While nearly everyone agrees that visualizations can distort and mislead, the traditional view states that visual language should avoid appealing to emotion. Persuasion has been typically associated with unethical design practices, bias, and deception. In an effort to minimize deception, it is recommended to focus on the data and the data alone (Tufte 1983).

It is debatable, however, whether such a noble goal is achievable. Even without any intent to persuade, generic data representations can convey a sense of authority and accuracy that may not always be warranted by their underlying data. Emotional effects cannot be avoided, in line with Paul Watzlawick's famous dictum that "one cannot not communicate" (Watzlawick, Bavelas, & Jackson 1967). The presentational codes and context of maps and data visualizations often convey as much information as the data they are supposed to express (Wood 1991).

This paper is based on the premise that there is no single objective way to visualize data. By better understanding the subjective and influential aspects of a visualization, we can better scrutinize design decisions and their effects on an audience. Even more, we can embrace the subjective nature of visualizations and make them more meaningful. To this end, we understand

visualizations not just as symbolic encodings of data, but more broadly as speech acts that signify meaning on many levels and in many contextual frames.

As designers explore ways to add a human perspective to data displays and impact how the audience feels about the information presented, research in psychology has found a large barrier on the ability of data to bring about feeling and empathy.

Mother Teresa famously said “If I look at the mass I will never act. If I look at the one, I will.” This paradoxical indifference induced by large numbers that psychologist Paul Slovic calls a “fundamental deficiency in our humanity” (2007) is a direct result of how humans think. Psychologists distinguish two systems of thinking: the experiential and the analytic system (Epstein 1994). The experiential system is the intuitive, fast-processing system that is associated with affect: the feeling that something is good or bad. The analytical system, on the other hand, is associated with logical thinking and slow processing. If we valued saving human lives through the analytical system of thinking, we would give equal value to each life, as shown in Figure 1. The affective response from the experiential system, however, exhibited by Small, Loewenstein, and Slovic (2007), Kogut and Ritov (2005), and Västfjäll, Slovic, Mayorga, & Peters (2014),

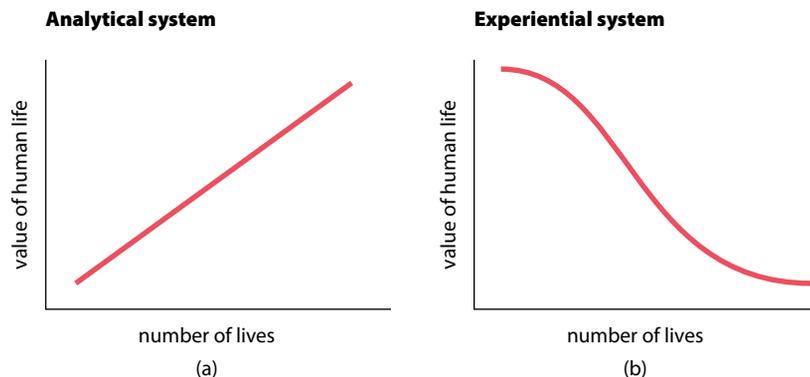
immediately decreases when considering more than one person (Figure 1).

Simply put, numbers representing lives do not communicate the importance of those lives—numbers numb. While this aligns with a strictly rational approach to visualization, it is somewhat hollow: “without affect, information lacks meaning and won’t be used in judgment and decision making” (Slovic 2007).

This study evaluates ways to overcome the numbing effect of large numbers not by manipulating or cherry-picking data, but by providing important context for the construction of meaning. Specifically, we focus on proximity techniques—the use of importance, proximity of time, and connection of place to evoke emotion in the context of visualizations. By evaluating the emotive impact of these techniques, we intend to improve our understanding of the communicative power of visualizations and, therefore, enhance our ability to connect the data to the people who explore it.

## 2. Background

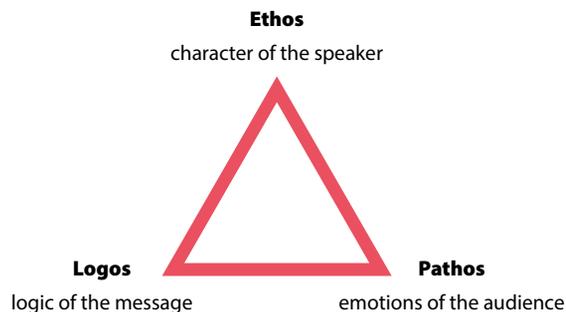
Appeals to logic, ethics, and emotion are the foundation of Aristotle’s system of rhetoric, which is the study of the means of persuasion (Aristotle, Roberts, Bywater,



**Figure 1.** Two models for valuing human lives: the first model (a) values lives logically; the second model (b) takes into account affect.

& Solmsen 1954). From a rhetorical perspective, data visualizations could be compared to what Aristotle describes as forensic speech, which is focused on past events and aims to present facts and evidence while avoiding everything non-essential. In crafting a rhetorical argument, Aristotle distinguishes between three different modes of persuasion: *logos*, *ethos* and *pathos*. *Logos* is the appeal to the logic of the message; *ethos* is the appeal to the character and credibility of the speaker; and *pathos* is the appeal to the emotion of the audience. These three modes of persuasion, commonly referred to as the rhetorical triangle, relate to one another and together increase the strength of an argument. When the modes are properly balanced within the argument, Booth defines this as the rhetorical stance (1963). If the modes are unbalanced, the stance can be corrupted. The argument is the most successful when each mode is valued (Booth 1963).

In his contribution to the contemporary study of rhetoric, philosopher George Campbell identifies seven circumstances that appeal to emotion: probability, plausibility, importance, proximity of time, connection of place, relations to the persons concerned, and interest in the consequences (1776). Three of these circumstances, namely importance, proximity of time, and connection



**Figure 2.** The rhetorical triangle.

of place, rise from Campbell's concept that we care more about people and events near us in time, space, and importance. More specifically, Campbell asserts that the future is more affecting than the past and that the connection of place is more impactful than the proximity of time, as it is permanent and therefore has a firmer ground of relation (1776). While these concepts were originally established with the written and spoken word in mind, they can also be applied to nonverbal forms of communication, including the selection of data and its visualization to represent a population that has closer proximity to the audience.

## 2.1 Rhetoric in design and visualization

Outside the domain of language, the design of artifacts is also used to persuade and communicate, with design assuming "a mediating agency of influence between designers and their intended audience" (Buchanan 1985). Within the rhetorical toolbox of the designer, framing, defined by anthropologist Gregory Bateson as the "spatial and temporal bounding of a set of interactive messages" (1972: 197), plays a central role. As Dörk, Feng, Collins, and Carpendale note, "Similar to a photograph's relationship to reality, visualizations do not capture reality as found in data but rather present a particular angle on it" (2013). The authors advocate for a critical approach that examines the intentions behind visualizations and their possible implications.

While framing can be used to distort how a message is received without actually changing it, Viegas and Wattenberg (2007) maintain that visualizations can be both persuasive and analytical. While many people have thought about various aspects of persuasion and rhetoric in visualization, there is, however, little empirical research on the persuasive effects of visualizations. Pandey, Manivannan, Nov, Satterthwaite, and Bertini (2014) conducted a study comparing the representation

of data in tabular form to its graphical form for a variety of topics. The results of the study suggest that visualizations have the potential to be more persuasive when the person does not already have a strong opinion on the topic.

**2.1.1 Data storytelling.** Perhaps the most obvious connection between classical rhetoric and data visualization can be found in the field of data journalism, the tight integration of data representations into textual narratives. Data storytelling comprises a set of methods for creating and evaluating data-driven stories (Riche et al. 2018). Beyond a concern for journalistic objectivity, data storytelling can be explicitly subjective and framed as personal narratives (Thudt et al. 2017). By creating a narrative, the designer makes editorial decisions that affect the overall message. As Martino notes, “usually there are several stories in the data—you have to select one. You can change the visualization by putting emphasis on a different story” (Offenhuber 2010). Narrative strategies of data visualization involve guiding the audience through the data exploration process along a spatial or temporal sequence (Segel & Heer 2010). Within narrative visualizations, Hullman and Diakopoulos (2011) identify four editorial layers where rhetorical decisions are made: data, visual representation, textual annotations, and interactivity.

**2.1.2 Persuasive cartography.** Visual forms of persuasion that rely on graphical rather than textual techniques can be found in the domain of persuasive and political cartography. Starting from the 1920s, the propagandistic potential of maps and their visual languages has been systematically investigated (Haushofer 1928). Judith Tyner (1982) investigates persuasion techniques that are based on the manipulation of cartographic elements. John Harley described the map as a site, instrument, and representation of power—“each map is a manifesto for

a set of beliefs about the world” (1991). Due to the close kinship between maps and data visualizations, many insights about persuasive cartography can be directly applied to data visualizations. Ian Muehlenhaus, who studied rhetorical styles of maps (2010), their components (2013), and their impact (2012), found that the use of emotive, versus geometric, symbols is among the most important variables used in persuasive maps, while the misuse of visual elements only played a marginal role.

## 2.2 Visualization and rhetoric: Points of discomfort

**2.2.1 Bias and deception.** These issues have received considerable attention in the literature. From an analytical perspective, bias represents a systematic and usually unintentional distortion of data. In the case of deception, data is misused or misrepresented to convey a specific message. While a designer may not always intend to deceive, the motivation to influence an audience can lead to deceitful decision-making. A plethora of literature educates and warns against the deceptive use of visualizations, such as Darrell Huff’s book *How to Lie with Statistics* (1954), Ed Tufte’s concepts of graphical integrity and the lie factor (1983), and particular uses and types of informal visualization by Jones (2011) and Monmonier (1996). Only recently has deception in visualization been empirically evaluated by Pandey, Rall, Satterthwaite, Nov, and Bertini (2015) who found that the four techniques tested did lead to a significant amount of misinterpretation.

**2.2.2 Visual embellishments.** Appeals to emotion in visualization are commonly associated with visual embellishments, elements that have consistently been a subject of debate. The term visual embellishments takes on different meanings, like decorations and other non-essential imagery (Bateman et al. 2010) or the more encompassing term of visual metaphor, where visual

embellishments are considered “a form of non-linguistic rhetorical figures” (Borgo et al. 2012). Tufte advocates strongly against their use, favouring a resolutely minimalist approach (Tufte 1983). Nigel Holmes, who encourages their use, asserts that a chart must be engaging and that “the purpose for making a chart is to clarify or make visible the facts that otherwise would lie buried in a mass of written materials” (1984).

Several empirical studies have assessed the impact of visual embellishments. The majority of studies (Bateman et al. 2010; Borgo et al. 2012; Borkin et al. 2013; Borkin et al. 2016; Haroz, Kosara, & Franconeri 2015; Vande Moere, Tomitsch, Wimmer, Christoph, & Grechenig 2012) focus on the impact of embellishments in terms of interpretation, memorability, and other related factors. When reflecting on their results, Bateman et al. (2010) considered the participant’s emotional response as a potential hidden factor in the increase in memorability with embellished charts. Boy et al. (2017) investigated the capacity of pictographic elements, so called anthropographics, to elicit empathy and encourage prosocial behaviour, which the results of the study, however, were not able to confirm.

### 3. The study

This study aims to add insight into the emotional impact of visualizations through techniques commonly implemented: techniques that bring the data closer to the viewer of a visualization in terms of time, location, or personal preferences. While Campbell identified these proximity techniques within the context of speaking, designers regularly employ these techniques as filters to the data (Kostelnick 2016). To this end, the data can be filtered beforehand to serve the audience information that is likely more relevant to them or a designer might give the user the autonomy to select data filters through interactive graphics. Our study considers the following

proximity techniques described by Campbell: proximity to interests, temporal proximity, and spatial proximity. While a relationship between proximity and emotion seems plausible, we lack empirical evidence that visualizations incorporating proximity techniques are effective in evoking any type of emotional response. This study aims to answer the question, “do proximity techniques increase the emotional impact of a visualization?”

#### 3.1 Case study selection

The case study used for this evaluation focuses on the plight of shelter animals. This topic was selected for multiple reasons. First, it has the potential to reach a large number of people. It is estimated that 68% of U.S. households own a pet, which makes the topic an interest to the majority of U.S. households. However, less than half of dog and cat owners adopt their pets, which indicates there is room to improve the awareness of pet adoption. Second, research shows that people are more likely to partake in prosocial behaviour towards a recipient if that recipient is not responsible for their plight (Saerom Lee, Winterich, & Ross Jr., 2014). Third, the ability to incorporate comprehensive data in shelter animal advocacy has only been recently possible through a national data collection initiative called Shelter Animals Count (SAC) (2017). We utilize the SAC database of intake and outcome counts for over 3,000 animal shelters across the US for 2016.

#### 3.2 Methods

To measure the effect of different proximity techniques on visualization, we conducted an experiment where participants were exposed to one chart about shelter animals and recorded their emotional response to that chart. Participants saw one of four chart treatments: a control chart without any proximity techniques included,

or the control chart with one of the techniques included: spatial proximity, temporal proximity, or proximity to interests.

The chart a participant was exposed to depended on the task they selected on the Amazon Mechanical Turk platform. Four Human Intelligence Tasks (HITS) were created on the Turk platform, one for each treatment. The tasks and associated survey questions were identical across HITS; the only variation was the chart treatment. Participants could only complete one of the four HITS one time. Two qualifications were implemented to filter the potential participant pool: participants must live in U.S. and have a HIT acceptance rate of at least 95%.

Emotion responses from participants in the three proximity treatments were compared to responses from the control treatment. By taking the difference of two responses, we remove any emotional impact caused by the topic alone and isolate the impact of the techniques to determine if they increase the emotional impact of the visualization. In doing so, we minimize the potential presence of a phenomenon frequently described as social desirability bias: the tendency to self-censor the true response to align it with social norms and preferences. This section goes further into detail on the study's measurements, chart design, and procedure.

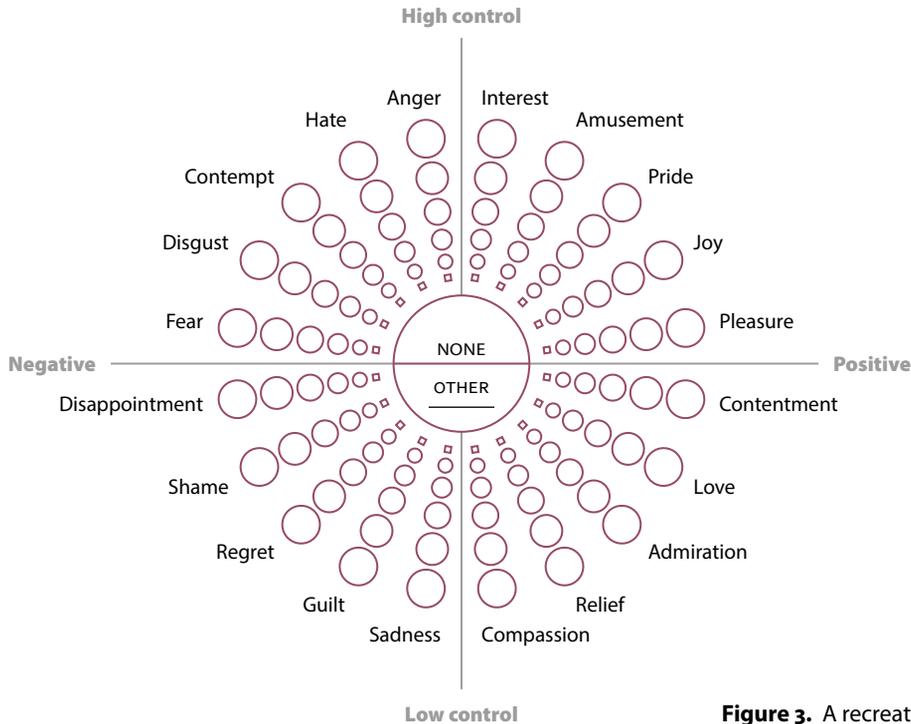
*3.2.1 Measurements.* Emotion is a term used in everyday language, but there does not exist one standard scientific definition of the term. Klaus Scherer defines emotion as “a process of changes in different components rather than a homogeneous state” (2001). The three widely accepted components—physiological arousal, motor expression, and subjective feeling—are known as the emotional response triad (Scherer 2001). This study measures a participant's subjective feeling using Scherer's Geneva Emotion Wheel (GEW) (2005). GEW, shown in Figure 3, is comprised of 20 emotion families located along the circumference of a two-dimensional space: valence (i.e.,

level of pleasantness, negative to positive) and the level of control felt (low to high). This combines two common methods for measuring subjective feeling: discrete emotions and dimensions. For each discrete emotion felt, the participant can rate the intensity of that feeling from one to five.

Since pathos is a mode of persuasion, additional measurements were included in this study for attitude change, topic involvement, and visualization literacy. To measure change in attitude, we followed the procedure of Pandey et al. (2014), utilizing a single-item Likert scale, a seven-step scale measuring the level of agreement or disagreement with a given statement. To better understand the conditions in which a person is persuaded under, persuasion researchers are attentive towards the concept of involvement (Johnson & Eagly 1989). This study aims to capture the varying levels of involvement the participants may have with dogs or cats.

Lastly, the study includes a measurement for visualization literacy. A recent study found that only 63% of its adult participants could accurately read a scatterplot (Funk & Goo 2015). This draws attention to the interpretation of charts being a learned skill, therefore it is unwise to assume adequate visualization literacy across the potential participant population. To test literacy as it pertains to this study, we utilize test items from Lee, Kim, and Kwon (2017) to devise one question for stacked bar charts.

*3.2.2 Chart design.* For greater interpretability across the general population, the chart has a simple design. The baseline chart, shown in Figure 4A, takes the form of a stacked bar chart: one stacked bar for shelter animal intake counts and one stacked bar for animal outcomes. The outcomes bar is divided into live and non-live outcomes. Both the intake and outcomes bars are further divided into subcategories through shades of their parent colour, denoting various types of intake (e.g., relinquished



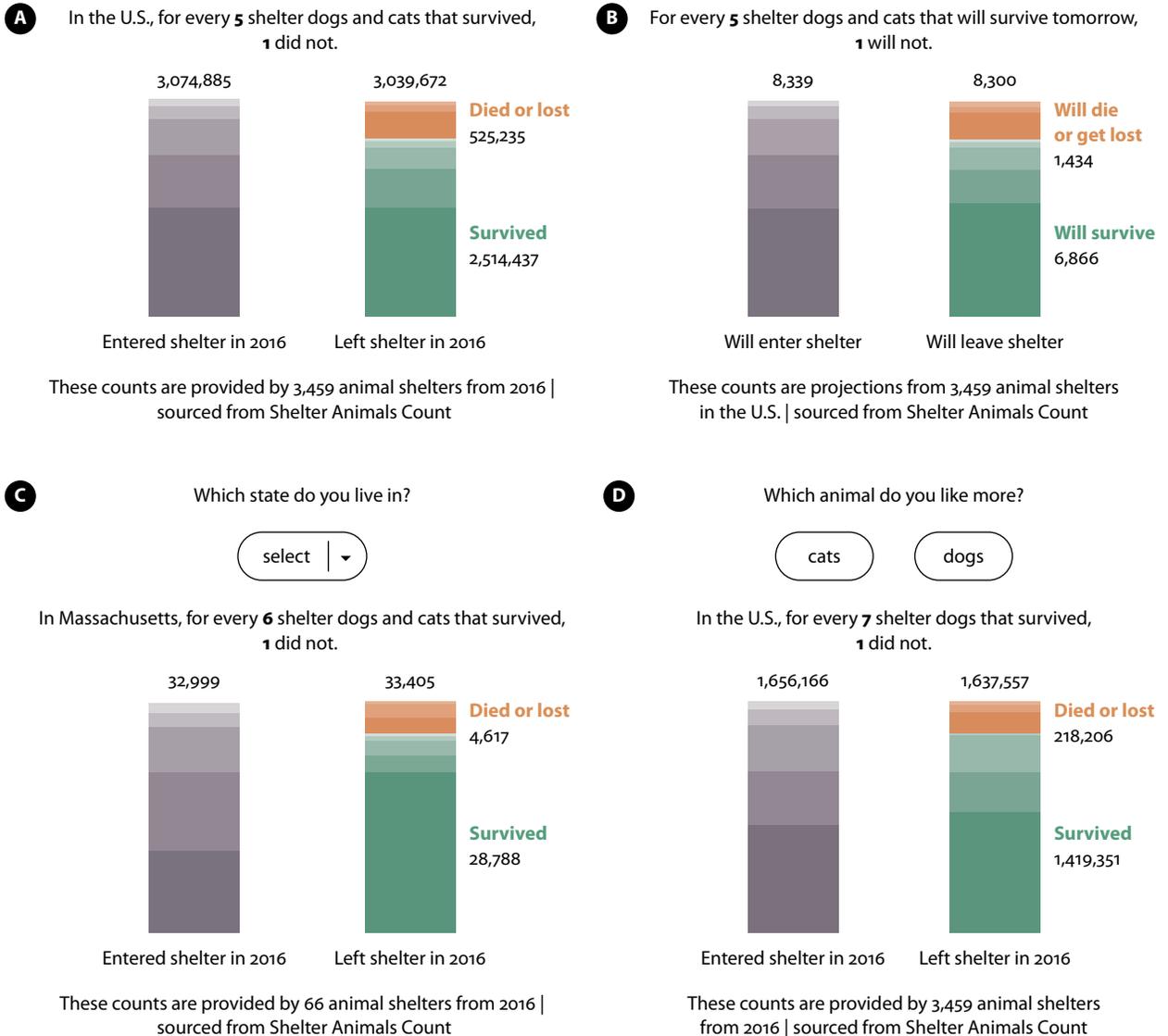
**Figure 3.** A recreation of the Geneva Emotion Wheel.

by owner) and outcomes (e.g., adoption). Labels and counts for these types are revealed by hovering over the respective bar. To emphasize the count of non-live outcomes, text sits above the stacked bar chart, taking the form of a ratio of live to non-live outcomes. The presence of this text aids in the comprehension of the large counts.

**3.2.3 Treatments.** One chart is implemented for each treatment; the variations are shown in Figure 4. The textual layer in each proximity chart adjusts to support the changes in the data layer, aiding the saliency of each proximity technique. Therefore, these techniques are represented in the surrounding context of the graphic, and do not rely on a change in the graphic elements.

Two techniques, spatial and interest proximity, require user input to determine the data subset of closest proximity to the participant.

In order to create a sense of urgency with regards to temporal proximity, the technique was synthetically derived by framing the data as projected counts for tomorrow. Therefore, the textual layer indicates what the ratio of live to non-live outcomes “will be”. Counts were determined by calculating the average daily counts from the 2016 data. The intention of this design is 1) to make the data feel more relevant and comprehensible, and 2) to mimic temporal proximity implemented in visualizations that represent real-time or forecasted data.



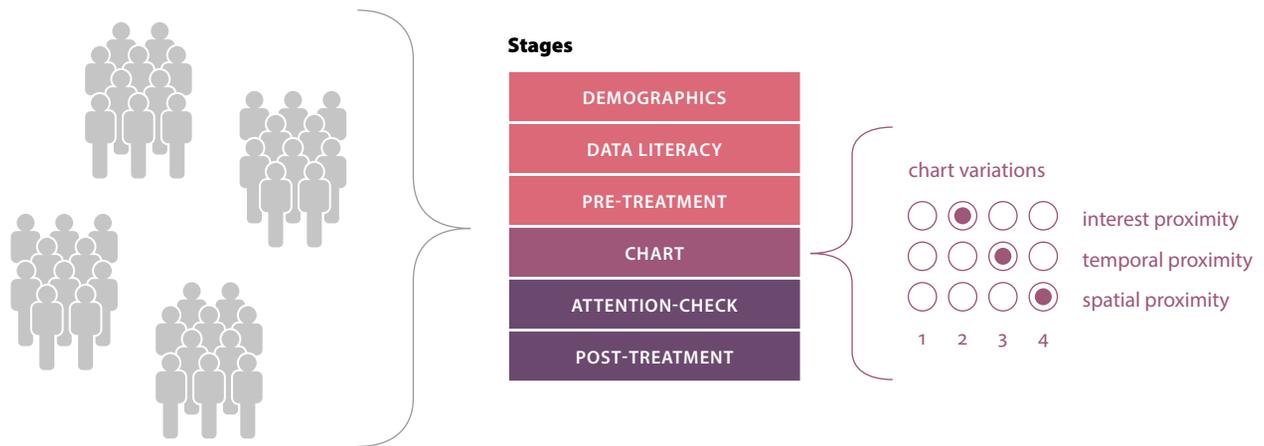
**Figure 4.** The chart design and subsequent variations for each treatment. A: the chart for the control treatment. B: variation for temporal proximity. C: variation for spatial proximity. D: variation for interest proximity. The variations shown in C and D require user input to filter the data that the chart displays.

### 3.3 Procedure

Once participants accepted the HIT, the Turk platform directed them to a survey. The stages of the survey are shown in Figure 5. Preceded by a consent statement, the survey contained six stages: 1) three demographic questions regarding age, gender, and education level; 2) a data visualization literacy question; 3) a topic introduction and two pre-treatment measurements: initial attitude and involvement; 4) exploration of one of the four interactive charts; 5) an attention-check question; 6) post-treatment questions: emotional response, post-treatment attitude measurement, and a free-response question regarding why the participant's attitude did or did not change. The survey concluded with a disclosure statement about the full purpose of the survey. 50 participants were recruited for each treatment, resulting in 200 participants in the study. The study took approximately 5–10 minutes to complete, and each participant was compensated \$ 0.50 for their time.

In order to analyze emotion responses from participants, we first identified the percentage of participants that rated an emotion to any extent and compared their emotion ratings, ranging from 1 to 5, across treatments. To test if an emotion was felt more strongly with the incorporation of a proximity technique, we compared the mean (i.e., average) of the treatment's rating for the given emotion to the mean rating of the control group. Since we treat the ratings as intervals, instead of categories, we performed a two-sample, one-sided *t*-test, which determines if the mean of one sample is significantly greater than the mean of another sample. We ran the *t*-test for all 20 emotions in the three tested treatments against the control group, resulting in 60 tests.

The *t*-test is a parametric test, meaning that it assumes the data has a normal, continuous distribution. While research shows that a sufficient sample size increases the robustness of *t*-tests to depart from normal distributions (Lumley, Diehr, Emerson, & Chen 2002), as a sanity check we also ran the Wilcoxon rank sum test, which is the non-parametric counterpart to the *t*-test. For



**Figure 5.** Stages of the survey.

*t*-tests with significant results, we calculated Cohen's *d* to determine the size of the effect, or difference in mean rating. Cohen's *d* value refers to the number of standard deviations the mean ratings differ by.

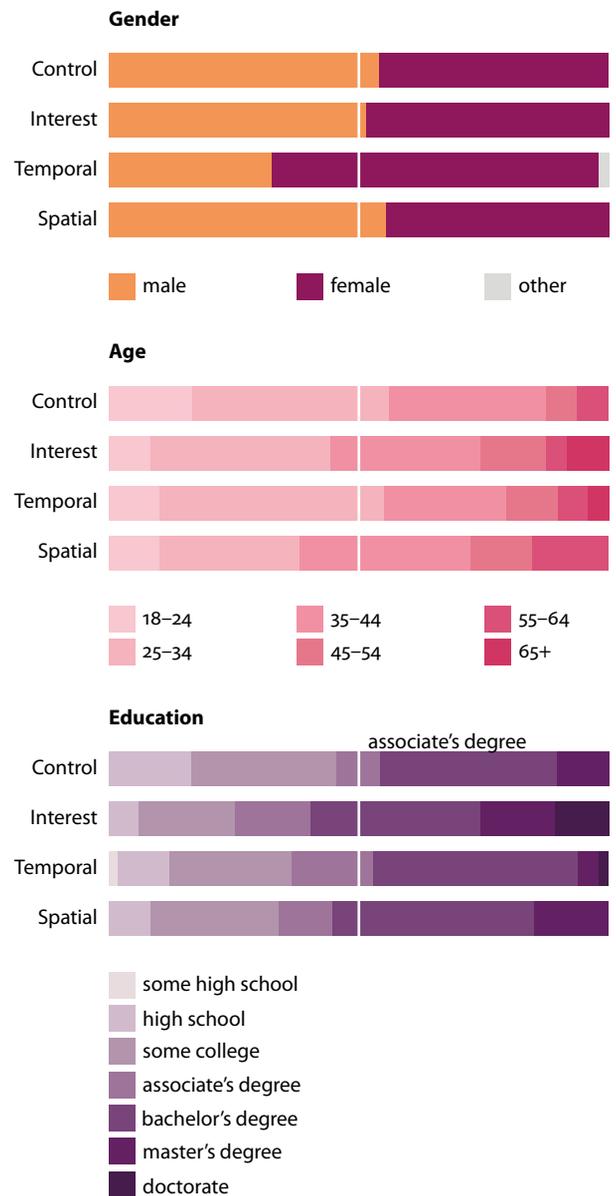
## 4. Results

The results of those who answered the data literacy and attention check questions incorrectly were omitted because these questions had one correct answer. The resulting number of participants after omissions range from 47 to 49 per treatment, totaling to 191 participants.

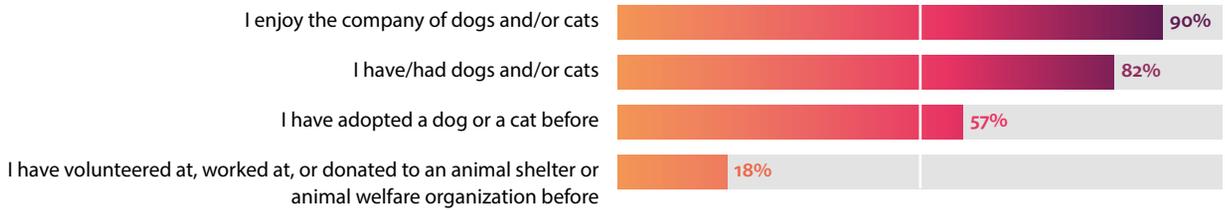
### 4.1 Demographics and involvement

Figure 6 shows the distribution of age, gender, and education across the four treatments. The majority of participants in each treatment (62–71%) fell within the age range 25–44. Three treatments had slightly more males than females. The temporal treatment, however, had twice as many females as males. The interest group was the most educated group, with 60% of participants receiving a bachelor's degree or higher. The control group had the most participants acquiring less than a college degree, resulting in 46% of the group.

Potential responses for involvement ranged from enjoying the company of dogs and/or cats to being involved with an animal shelter or animal welfare organization. Participants could select multiple levels of involvement. Responses indicate a high level of involvement within the participant pool, shown in Figure 7: 5% of the participants did not identify with any of the involvement categories. Across the four treatments, the distribution of involvement is roughly equivalent. The largest difference occurs in the temporal proximity treatment, where 65% of participants have adopted before, which is 9% more than the next closest treatment.



**Figure 6.** Distribution of demographics responses.



**Figure 7.** Distribution of involvement responses.

## 4.2 Attitudes and changes

Initial attitudes from the Likert scale were categorized into three groups: negative, weak, and positive. The majority of responses across the four treatments are positive (agree and strongly agree), from 67% to 83%. Attitudes were measured once more after exposure to the chart, and their change in attitude was calculated. Since it is far easier to form a new belief than change an existing belief (Hoeken 2001), our analysis of attitude change focused on those with an initial weak attitude. Despite the small sample size, we ran a one-sided *t*-test for each treatment where the initial attitude was weak. Only the results for the temporal treatment were significant with a *p*-value of .01.

## 4.3 Emotion

We found that 15 of the 20 emotions were felt at some capacity by over half of the participants. Consistent rating of emotions across treatments was verified. The frequency of ratings across treatments is illustrated in Figure 8.

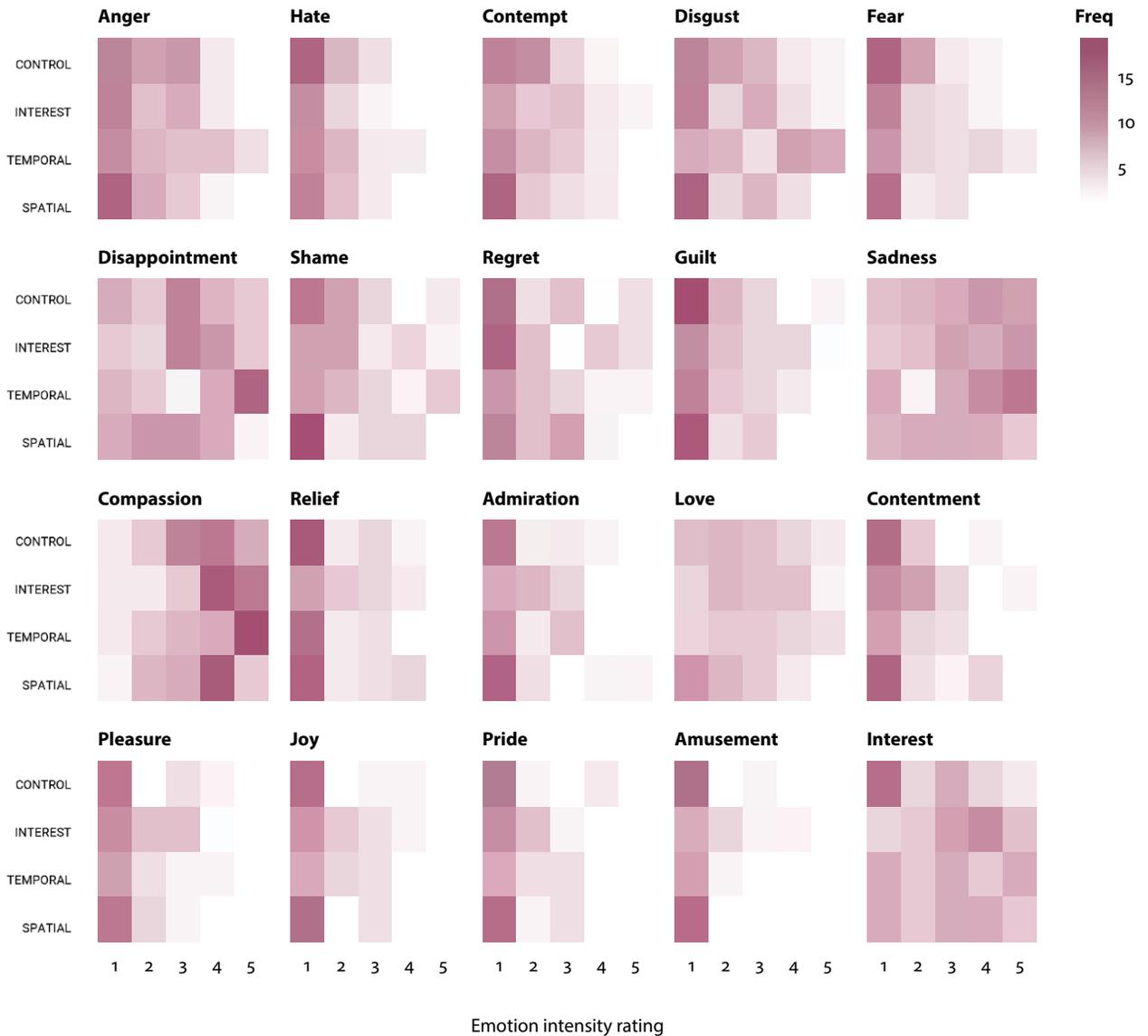
Among the 60 tests, six resulted in significant findings, shown in Figure 9. Under a significance level of  $p = .05$ , the strength of Interest felt among participants in all three proximity treatment groups were statistically greater than the control group. This was the only emotion that resulted in statistically significant results

within the spatial and interest treatments. For the temporal treatment, three additional emotions resulted in statistically significant results: Disgust, Fear, and Disappointment. The Wilcoxon rank sum test confirmed these differences. Based on Cohen's *d* values, three of these significant findings yielded a medium ( $d = 0.5+$ ) effect: Disgust and Fear for temporal, and Interest for interest proximity. The remaining significant findings yielded a small ( $d = 0.2+$ ) effect.

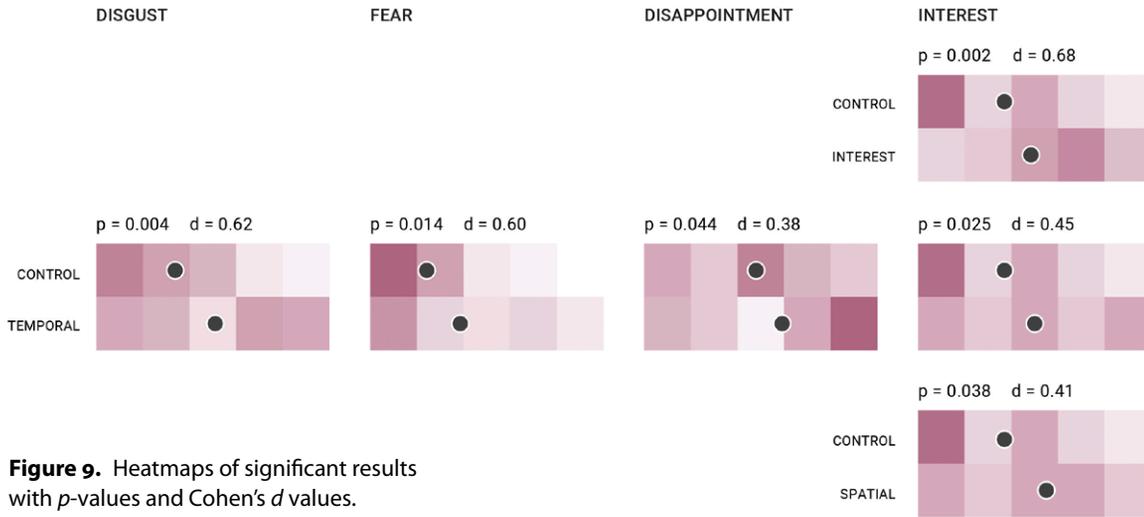
## 5. Discussion

These results validate Campbell's assertion that the future is more affecting than the past. They also validate the logical assumption that people are more interested in the visualization when the data aligns with their interests, or in this case, their preference of dogs or cats. The results did not validate, however, Campbell's assertion that the connection of place is more affecting than the relevance of time. The source of this difference, and the general lack of significant results with spatial and interest proximity, may lie in the implementation of these techniques within the study.

Treatments for interest and spatial proximity enabled the user to select the subset of the data that would be visualized. Because this resulted in a true subset of the data, participants were not exposed to the same data and therefore not the same ratio for live to non-live



**Figure 8.** Small multiples of heatmaps showing the frequency of emotion ratings for each emotion and each treatment.



**Figure 9.** Heatmaps of significant results with  $p$ -values and Cohen's  $d$  values.

outcomes. The control and temporal treatments present a 5:1 ratio. Ratios from the interest treatment ranged from 5:1 to 7:1, and ratios from the spatial treatment ranged from 2:1 to 24:1.

Given the variability of subsets that the participants were exposed to in these two treatments, it is probable that different messages were interpreted from the data. Without holding the data constant, the capacity for a direct comparison to the control treatment is limited. This is a hurdle with testing these techniques. To ensure a consistent message is delivered, future research should consider synthetically deriving the subsets or selecting a dataset with a message that remains constant through the selected subsets.

Another difference in this study's implementation of these techniques comes from the limitations of the data source. We implemented interest and spatial proximity within the restrictions of the data in an effort to maintain an ethical design and an authentic experience for the participants. Because the data source at the time did not offer potential to implement

temporal proximity, we incorporated this technique without restrictions. Future research should consider consistency across the treatments in regards to following data limitations or disregarding them across the board.

## 6. Conclusion

We present a study testing whether the presence of proximity techniques increases the emotive impact of a data visualization. The results of the study indicated that temporal proximity has the strongest emotive impact of the proximity techniques tested. The emotions Interest, Disgust, Fear, and Disappointment were felt more strongly with the inclusion of temporal proximity in the chart. Both Disgust and Fear produced medium effect sizes. Interest was the emotion most influenced by the use of proximity techniques, as it was felt strongly in each proximity treatment. Interest was particularly strong for interest proximity, producing the smallest  $p$ -value and the greatest effect size.

These findings indicate that the framing of data matters, that people feel greater interest towards a topic when the visualized data are more relevant to them, and that data representing events closer in time are more affecting. These techniques progress toward more human-centric designs, where considerations toward the audience are emphasized, and validate that design decisions in the data layer of the visualization can increase emotive impact. It can be argued that framing the data in such a way leaves data points out, thus not telling the full story of the dataset. However, when the framing increases relevance to the viewer, thus increasing its impact on the audience, while maintaining a truthful connection to the underlying data, the framing is justified.

As with all techniques meant to influence, these proximity techniques can be subjected to unethical use. For instance, if real-world visualizations falsely frame data as more temporally relevant than they actually are, they are trading honesty for affect, thus deceiving the audience. Therefore, as we begin to understand the emotional impact certain design decisions have, we must be equally vigilant in identifying their use for deceiving.

We intend this research to improve our understanding on the use and impact of pathos techniques in visualizations. With an enhanced understanding and further validation, visualization practitioners that strive to connect feeling to data will have validated techniques to do so. The validation of pathos techniques leads to established uses and critical approaches, so that the cloudy space that is emotional appeals in visualization today can be clarified, evaluated, and reflected upon.

In order to reconsider the value of pathos in data design, one does not have to, and should not, reduce the role of logos and ethos. It is the combination of the three persuasive modes together that create powerful, effective messages. Although emotion is commonly seen as the adversary of reason, the two work better together than apart; as Campbell said, “passion is the mover to

action, reason is the guide” (1776). If our community gives pathos proper consideration and attention, we have the potential to improve our communicative ability with data, to add the human element behind the logic, to simultaneously inform and affect.

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