Iowa Art Impact: Using Data to Contextualize the Impact of Art in Iowa

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I. Introduction

Art has the power to transform lives. It can inspire, uplift, and provide comfort. It can give voice to the voiceless, broaden horizons, and challenge the status quo. Its therapeutic qualities offer healing and solace to those facing challenges and hardships. It can infuse a community with beautiful imagery, spark creativity, and lead to a more positive social and economic environment. The arts play an immensely pivotal role, not only in the personal lives of the artist, but also in the community as whole.

We aim to provide insights that help those in the art's and those making political decisions. These decision makers will need to understand the relationship between art and quality of life if they want to make the best possible decisions and improve our community.

To gain deeper insights into this relationship, we can pose questions and offer answers on topics such as the distribution of art in Iowa, regions with the highest-paying art jobs, and whether areas with greater artistic presence also enjoy higher quality of life.

Because various things fall under the scope of art, we analyzed things such as art centers, performing art centers, and art museums, as metrics for art. Likewise quality of life requires various metrics studied separately such as life expectancy, education, income, and more in order to paint a picture of the quality of life of an area.

Yet, it can be a challenge to quantify the positive impact art can have in a community. With risks of potential underfunding of art programs, it becomes imperative to highlight the significance of the arts to policymakers, community members, and others alike.

Goal

With this project we aim to provide insights regarding the impact art has on quality of life and social capital.

The primary objective for this project was to gather, assess, and analyze data related to art in Iowa communities, in order to answer the question What is the relationship between art, quality of life, and social capital in Iowa?

II. Methodology

Data Collection

We collected data pertaining to different aspects of art from multiple online data portals. These sources include data from:

- The Bureau of Economic Analysis
- National Endowment for the Arts
- U.S. Bureau of Labor Statistics
- Iowa.gov
- Iowa County Health Rankings & Roadmaps

We also gathered data from web scraping these sources:

- www.publicartarchive.org
- State Historical Society of Iowa

Significant amount of work went into cleaning and transforming these data sources into tidier formats to be used in the visualization service Tableau.

Visualizing Art w/ Dashboards and a Simple Linear Model

Using these sources of data we were able to visualize and assess areas in Iowa that are more "arts inclined." We also provided context into which art related jobs were most popular, highest paying, and which cities contained a higher concentration of artists.

- By using the State Historical Society of Iowa data, which contained information on art centers, museums, performing arts centers, and their locations, we were able to create a heat map detailing the concentration of art institutions. Coining the term, "art presence", that represents the number of art institutions in each county.

- By using the National Endowment for the Arts data, which contained information on federal funding of arts projects, we were able to create an interactive dashboard that details where funding was being allocated to.

- By using The Bureau of Economic Analysis data, which contained information on the Arts, Entertainment, and Recreation GDP output for each county, we were able to create interactive dashboards detailing GDP output. Also using this data, we created interactive scatter plots that plot certain aspects of quality of life vs the Arts, Entertainment, and Recreation GDP to examine any correlations.

- Using the "art presence" of each county mentioned earlier, we created a simple linear model that predicts the average Arts, Entertainment, and Recreation GDP output per person based on an increase of art presence.

Examining Extensions of Social Capital and Quality of Life

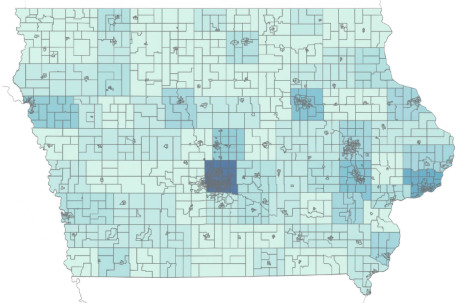
After examining the relationship of art and quality of life, as well as art and its relationship to social capital, it is important to break down the relationship between quality of life and how it serves as an extension to social capital.

This analysis was done by breaking down three indicators of social capital: mental health, education, and social association. Each of these aspects are broken down into levels of individuality. On the most individualist level, mental health is examined first. On a partial individualistic and partial group based level, education is measured second. Lastly, on the most group oriented level of individuality, social association is measured.

The method of examination is to look at exploratory data in one level of individuality, then draw comparisons. The same follows for the next two levels of individuality. The examination process is rounded off by comparing data across levels of individuality.

III. Results, Dashboards, and Visuals

Analysis of Art Presence

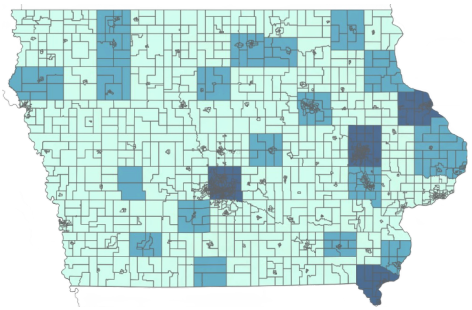


Performing Art Centers(link)*select layer performing arts

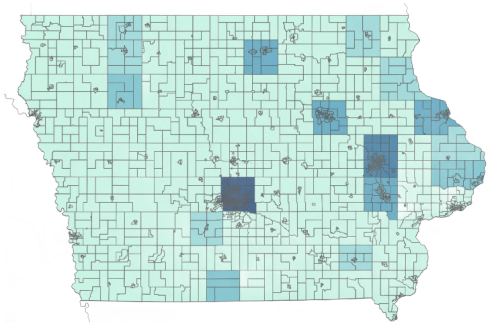
We can see performing art centers mainly in polk, Linn, Johnson, and Scott counties.

Art Centers(link)

4 counties have 2 art centers, and 66 counties are without an art center.



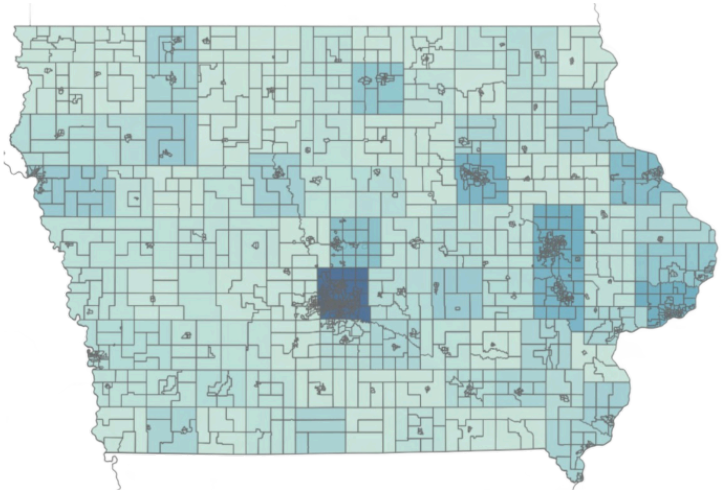
Art Museums(link)



Polk, Linn, Black Hawk
Unsurprisingly have higher amounts of art museums, unexpectedly so does
Less populated areas such as Buena Vista and Cerro Gordo.

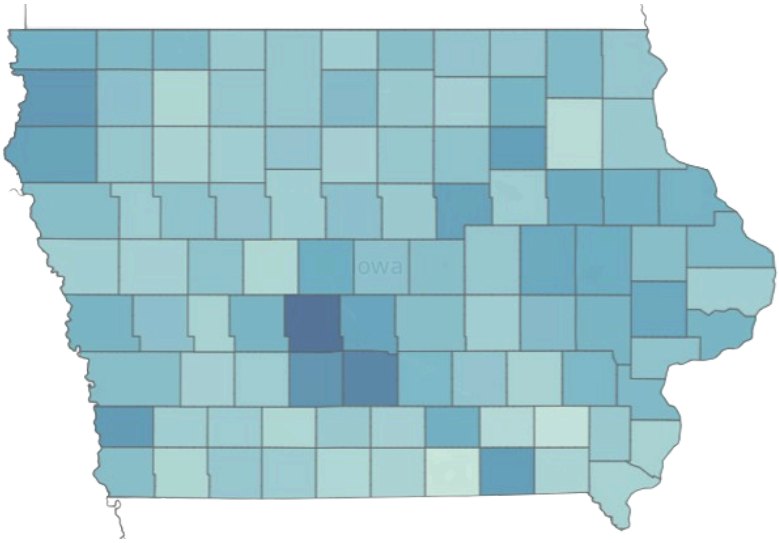
Total Art Presence(link)

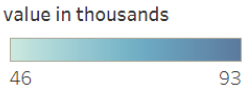
*all art structure maps combined



County	Art Presence
Polk	21
Scott	10
Linn	10
Black Hawk	9
Johnson	9
Dubuque	8
Story	7
Clinton	6
Cerro Gordo	6
Buena Vista	5

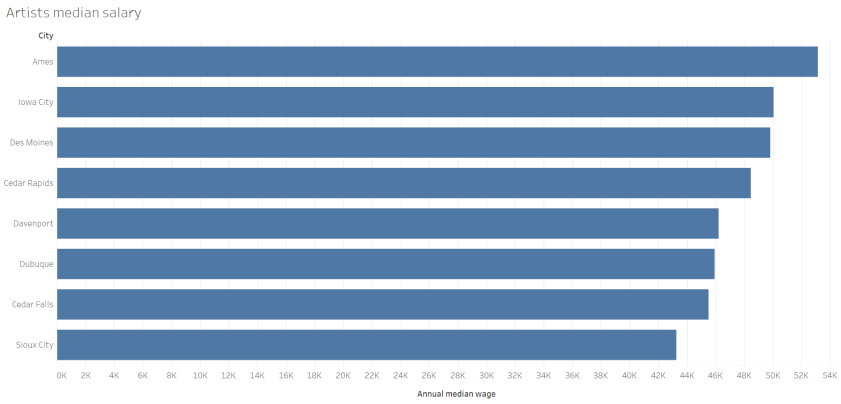
Analysis of Income by County To Art Presence(link)





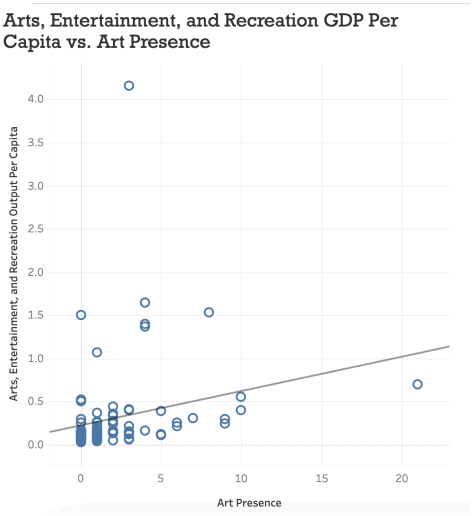
The suburban counties around the Des Moines metro area have the highest household income but a normal level of art presence. There's potentially some correlation between art presence and household income but definitely some counties that don't show any correlation.

Analysis of Art Salaries To Art Presence(link)



Looking at the area's that pay the most to artists, we can see that the college town's tend to pay more to artists as well as areas of high art presence.

Analysis of Art GDP to Art Presence

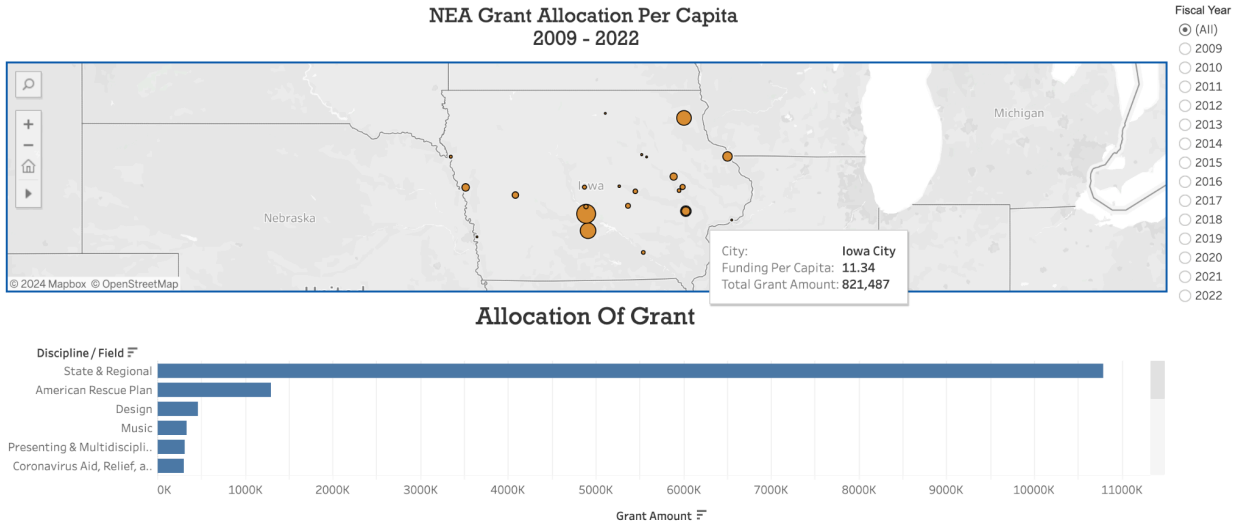


Here we are comparing the relationship of arts GDP output (BEA data) for each county to the art presence(state historical society data) of each county.

We can see a moderate correlation between a county's art GDP output and the county's art presence.

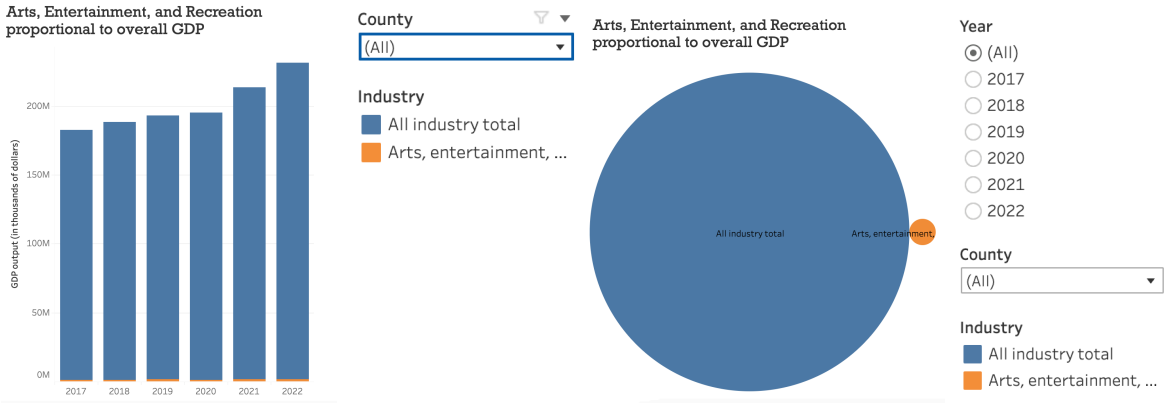
When fitting a line for this correlation we can predict that for every 1 increase in Art Presence (an additional art structure in the county) on average produces an additional $39.66 per person in arts GDP.

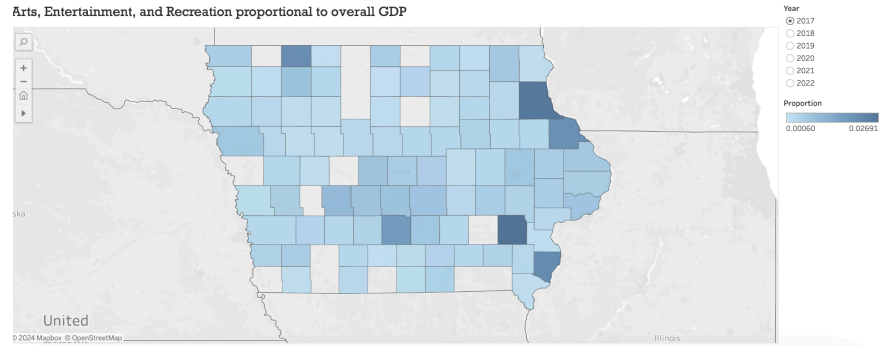
National Endowment for the Arts Dashboard (Link)

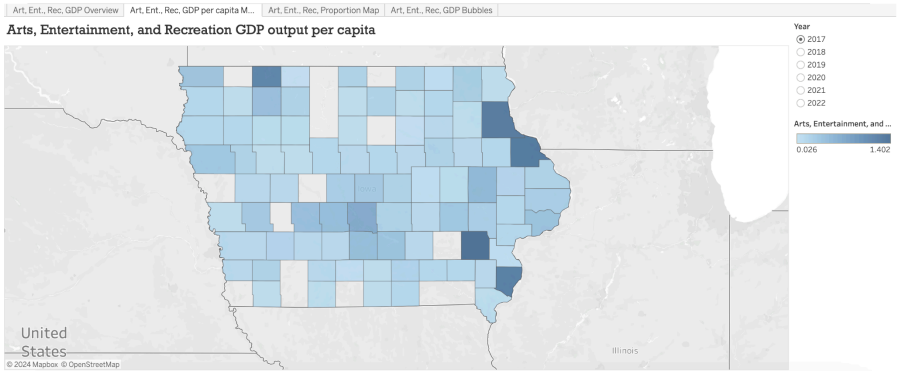


This dashboard shows where National Endowment for the Arts funds are being allocated in Iowa. It is also interactive in the case that a user can select a year, city, or Discipline/Field. The circles on the map represent the NEA funding per capita for the city.

Arts, Entertainment, and Recreation GDP Dashboard (Link)

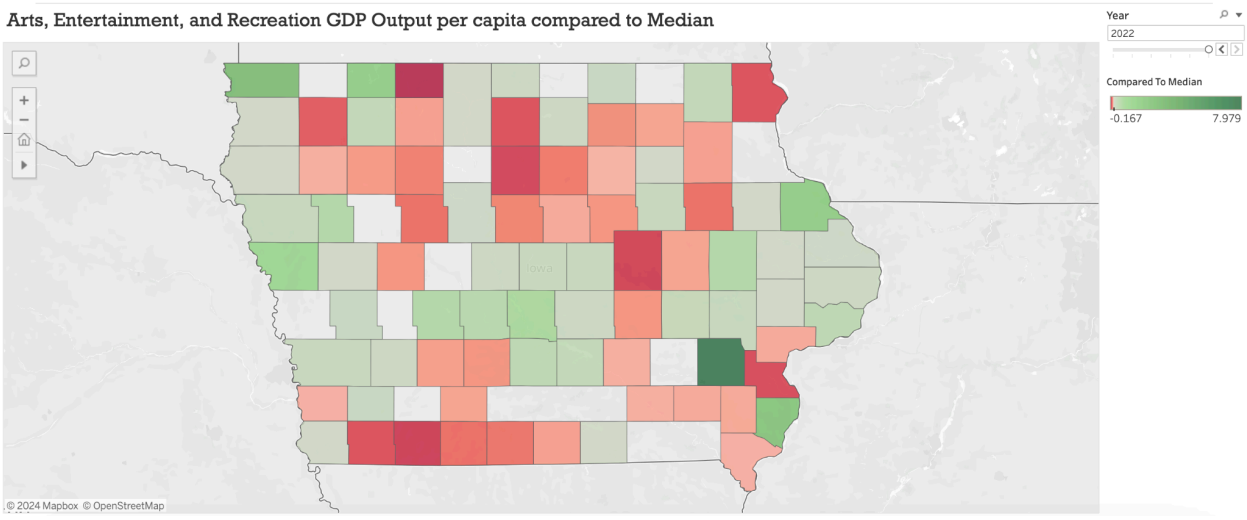






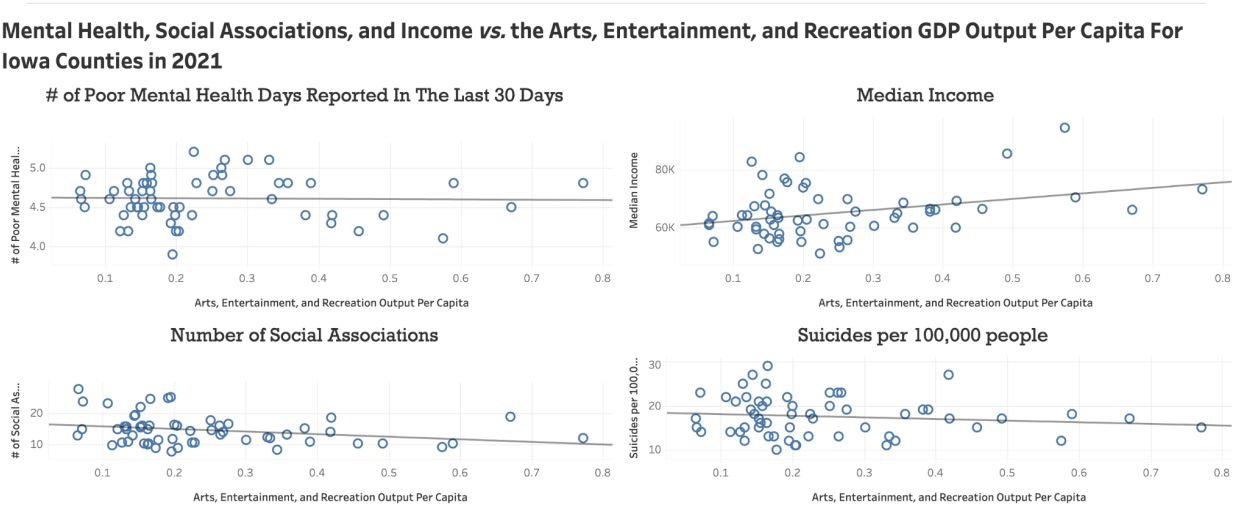
This dashboard shows the proportion of Arts, Entertainment, and Recreation GDP in relation to the overall GDP of the county. It also contains maps that show the proportion, as well as the Arts, Entertainment, and Recreation GDP output per capita. The aim of this dashboard is to compare counties Arts, Entertainment, and Recreation GDP output so we can assess how much each county is producing economically. This is also interactive as a user can filter by county.

Arts, Entertainment, and Recreation GDP Compared to Median (Link)



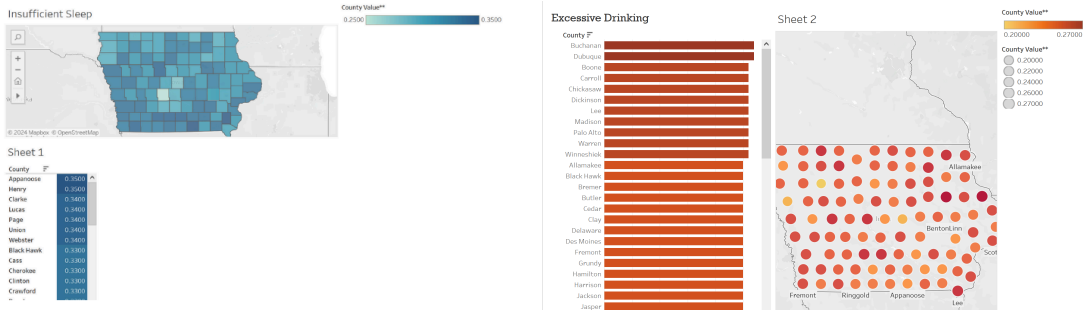
This dashboard shows each county's Arts, Entertainment, and Recreation GDP output relative to the median Arts, Entertainment, and Recreation GDP output in Iowa. The aim of this visualization is to assess which counties are lagging behind the median in their economical output of Arts, Entertainment, and Recreation. We can see which areas of Iowa are producing Arts, Entertainment, and Recreation output better than others.

Scatter Plots Dashboard (Link)



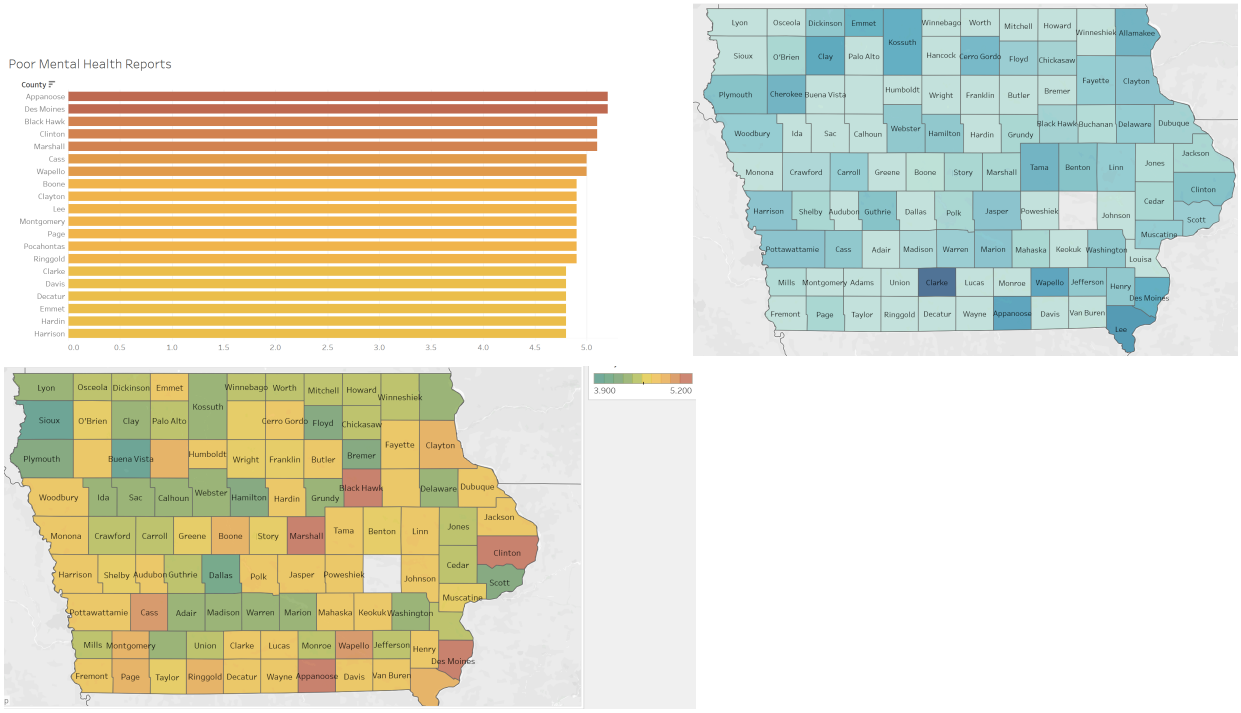
This dashboard shows each county's measures in Number of Poor Mental Health Days, Median Income, Number of Social Associations, and Suicide Rate plotted against the Arts, Entertainment, and Recreation GDP output. This is interactive in that a user can select a point on the scatter plot, and it will highlight the point representing the county in the other scatter plots.

Discussion & Visuals of Social Capital Relations



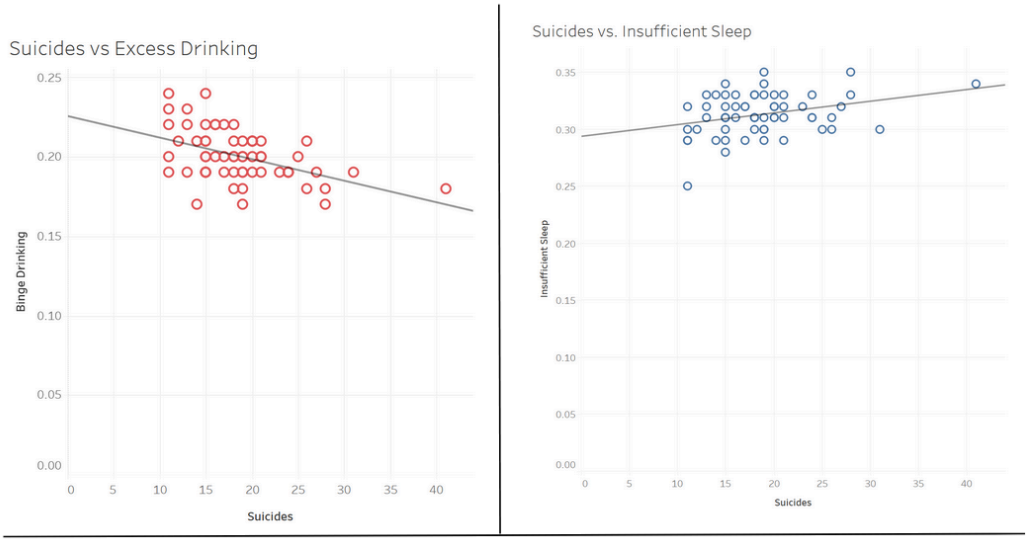
The first mental health data explored is the insufficient sleep data, taken from 2020 and is defined as less than seven hours. The standout county for low reports of insufficient sleep in this example is Dallas county, where we see earlier, has the highest income.

Insufficient sleep was followed by an examination of excessive drinking. On the surface level, Buena Vista county stands out as one that has low reports compared to other counties, and will play as an important outlier in the education data as well.



The next mental health data explored is poor mental health reports and suicide rates. The data for Iowa county was unreliable, and finding data was not consistent with the main dataset. Due to this, Iowa County was left out for reasons of consistency across all counties.

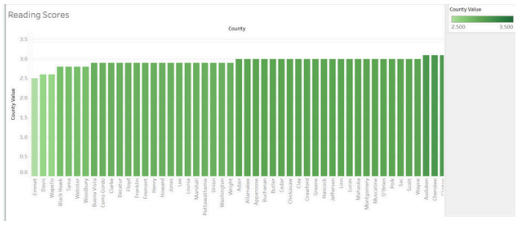
We now compare the mental health findings for correlations

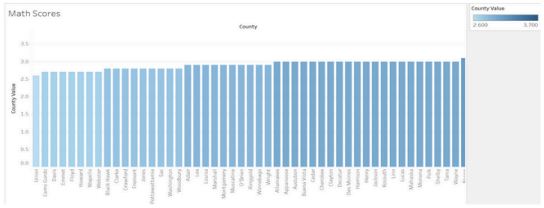


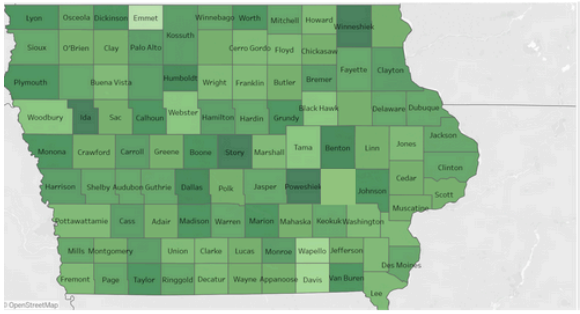
The suicides vs. excess drinking has negative correlation. As a conclusion, we cannot use excessive drinking as correlation nor causation for suicide rate.

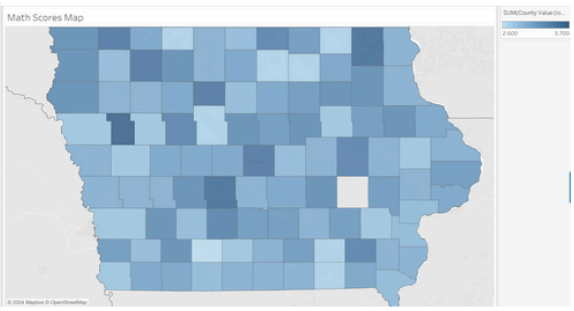
The suicides vs. insufficient sleep has a slight correlation, and while we cannot say that insufficient sleep is a cause of the former, there is a potential for its use as an indicator. For future studies, finding out causes of insufficient sleep may be helpful in predicting suicide rates.

We now move on to educational data

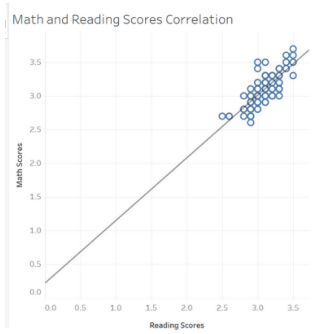




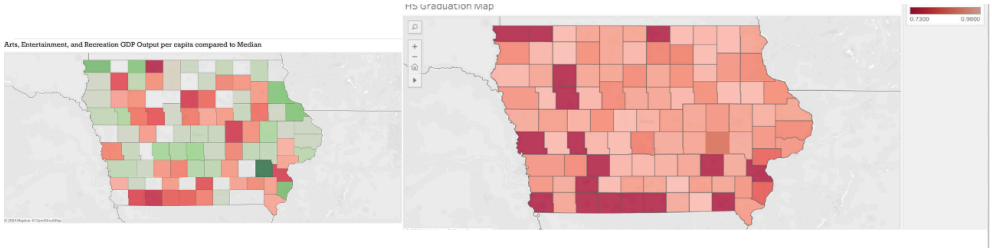




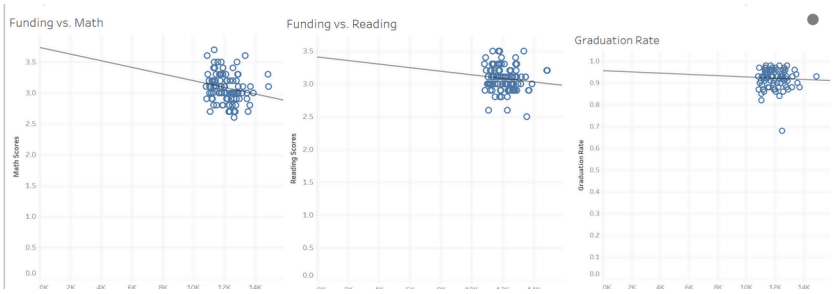
The English Language Arts standardized test scores and the math standardized test scores for elementary school students were two points of measurement in this case. Both math and reading skill sets differ significantly, and this comparison was done to see if the difference in necessary skill sets affected the math and reading performance.



We can see from this math and reading assessment correlation, that higher reading scores are more likely to correlate with higher math scores. A point of future reference is to conduct a study of individual students and examine if math scores and reading scores correlate on an individual basis.

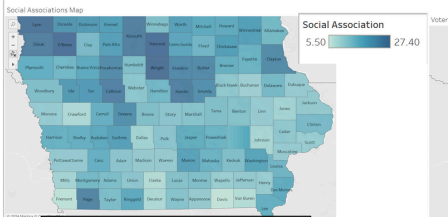


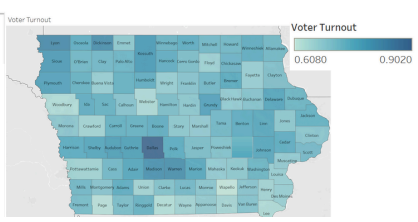
When comparing the high school graduation map (right side) to the arts, entertainment, and recreation GDP, we see that the counties on the bottom row like Decatur, Taylor, etc, there is a strong correlation on a surface level.

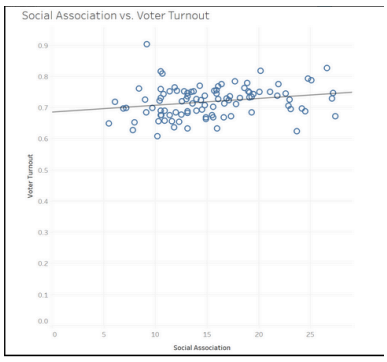


The comparison phase for education examined school funding per pupil and the shared relationship between math, reading, and graduation rate. There is little to no correlation between any of the listed. Buena Vista is the outlier for graduation rate vs. School funding, yet it stood out for strong mental health.

Social and Interactive Qualities

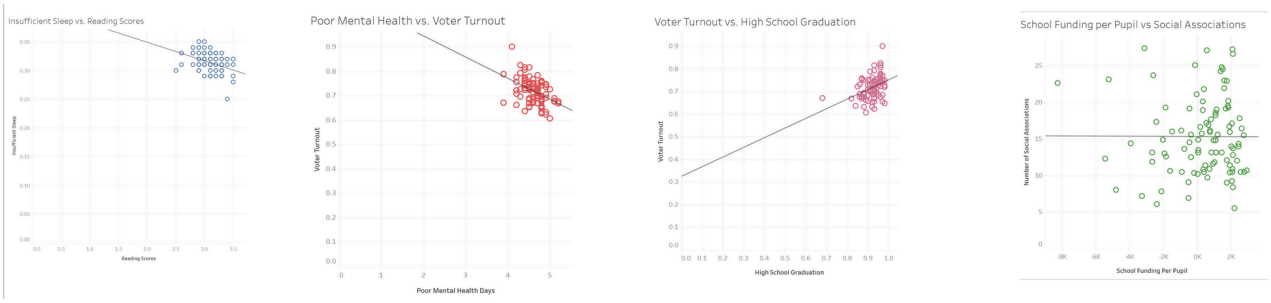






For the least individualistic tier, we explored and compared the number of social associations per county with the voter turnout for the 2020 presidential election. We see a slight positive correlation with the two data points, however, correlations on the map are slim. Dallas county once again stands out for the highest voter turnout, which is a possible correlation to the ranked county income.

Cross Comparison of Mental Health, Education, and Social Associations



This is a cross comparison consisting of insufficient sleep compared to reading scores, poor mental health ratings compared to voter turnout, Voter turnout compared to high school graduation, and lastly, school funding compared to the number of social associations. We see the strongest correlation in insufficient sleep compared to reading scores, and the weakest, in school funding compared to social associations. The first two comparisons have a negative correlation, the third a positive correlation, and the last comparison has none. Future research may be directed towards examining the relationships between education and quality of life on a closer level, as it may provide us practical insights as to how to improve education across counties.

IV. Discussion

The aim for these visualizations and dashboards is for them to be used as tools to assess the landscape of the arts in Iowa. We were able to point out certain areas of Iowa that are lagging behind in their art presence and output, namely the southern border counties of Page, Taylor, Ringgold, and Decatur. We were also able to highlight counties that perform consistently better than others in their art output, like Dubuque, Clayton, Washington, and Polk.

When taking a deeper examination of quality of life and how it serves as an extension of social capital, we can break down quality of life by measures of individuality. The resulting categories are mental health, education, and social characteristics. The process examined exploratory data in each category and drew correlational conclusions. Lastly, the process cross-examined mental health data, education, and social characteristics.

Starting with mental health data, we first examined insufficient sleep, which was measured as less than seven hours per night, and excess drinking. The project earlier found that Dallas county stood out in terms of median income, and it stood out here as having the lowest reports of insufficient sleep. Additionally, Buena Vista county was also one of note for later on in the analysis, where we see a low report for drinking rates. Further examining poor mental health and suicide rate, Appanoose county stands out for the opposite reason as Buena Vista, which shows some correlation at the anecdotal level. When comparing mental health data, it is important to ensure that the data has clear and set definitions for the sake of objectivity. For this reason, poor mental health was not chosen in the comparison to suicide rates, as the definition of “poor mental health” varies from person to person. The comparison between suicides and excessive dribking showed us that due to the negative correlation, excessive drinking cannot be represented as

neither an indicator nor a cause for suicide. The lack of correlation between suicides and insufficient sleep offer a similar conclusion between the respective variables.

The next tier of individuality is education, where the standardized test scores for reading and math for elementary school students were the points of measurement. It was important to retrieve both math and English scores as the two tests require a vastly separate skill set. However, we see that the two types of tests were correlated in that a higher reading score indicated a higher math score. A point of further research could be a closer examination on the basis of individual students, where we examine how a higher reading score affects the math score. The graduation rates for high school students had a map that correlated with the arts, entertainment, and recreation GDP map. We see the bottom row of counties having similar outlooks in terms of results on both maps. Another correlation we see is with Buena Vista in the map of graduation rate, where it stands out for being low. This is a stark contrast to how well Buena Vista represented itself in the mental health data.

Lastly, we examine social characteristics like social association and voter turnout. These two datasets have a slight positive correlation with each other, indicating that the more socially involved an individual is, the more likely that they are going to exercise in voting. Additionally, the map does not show any correlations on the anecdotal level.

The last step is to cross compare the three tiers of individuality, where we examine how mental health compares to education, and how those compare to social characteristics. We see a positive correlation between high school graduation and voter turnout, while poor mental health and voter turn-out have a negative correlation. School funding and social associations were also compared. The hypothetical assumption was that schools with higher funding tend to have more extracurricular activities. In these communities, it may be more normalized to have students continue extracurriculars in adulthood in the form of other social associations. However, when compared, there is a stark lack of correlation, meaning that the hypothesis is proven false. Further, we did not find much correlation in our attempt to quantify the arts relationship with certain aspects of health and quality of life. In future iterations of this project, more data and better measurements of art presence could prove to be beneficial.

Future research may be productive in answering the “why” to the data. We establish correlations in our data points, however, correlation does not equate to causation. Determining what causes the correlations and the meanings behind them may help further the understanding of how we can improve the presence of art through the promotion of quality of life and social capital.

V. Future Work

We have found some limitations with our current research. As this project evolves we have some recommendations to explore. Currently our research includes data from the BEA, yet that data ecompasses the Arts, as well as Entertainment and Recreation. This is a limitation as it might not reflect an overtly accurate representation of the Arts output.

Also, administering surveys that addresses community member's opinions on seeing, interacting with, and producing art would be an immense source of information.

Further, we did not necessarily address people's ability to travel for their art related needs. People may be traveling over county and city lines to attend concerts, museums, and art centers. This could prove to be an interesting and telling further analysis.

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