

Explorative research into the correlation between the satisfaction of citizens, geographical proximity to municipal services, and social-economic factors within the municipalities of Groningen and Eindhoven.

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Abstract

In this thesis, a correlation between the satisfaction of citizens in the municipalities of Groningen and Eindhoven, geographical proximity to municipal services, and social-economic factors is sought. To find this possible correlation data has been gathered from multiple secondary data sources. The analysis is done by creating multiple maps utilizing this data using ArcGIS software to look into possible relations between the indicators. The results of this analysis are weak but give an insight into the situations of Groningen and Eindhoven and perspective for more in-depth research with a wider scope.

Keywords: citizen satisfaction, local governance, proximity, social-economic factors, ArcGIS

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Background

In recent times there has been a push to both measure and improve the quality of public administration across both national and more local levels(Boyne and Chen, 2007). Many different models and ways with a great number of possible variables to measure these levels have been utilized and proposed over the years. Since the introduction of New Public Management(NPM) as a divergence from the older Public Management(PA), public administrators have been conducting their organizations more like a private business as a way to increase their efficiency and performance levels(Michael Barzelay, 1992). This has also lead to public organizations looking at citizens as customers. In modern times many citizens have started to expect similar levels of service of their local public administrations as of private businesses(Bouvard, 2009). For businesses, it has been shown that customer satisfaction is an important factor in the success of the company and is an indicator of the success of companies(Almohaimmed, 2019). This has in turn leads to the reasoning that the level of satisfaction that citizens have with their public administration could be an indicator of their level of performance in a similar fashion.

Proximity is a term that has been on the rise in urban planning in recent times(Gil Solá and Vilhelmson, 2019). The term is very broad and can be used in varied ways but for this research, the focus will be on geographical proximity meaning the physical distance between things. This is an interesting concept to look at as geographical proximity can be seen as a potential benefit for organizations to boost their efficiency and coordination(Boschma, 2005). Increased proximity in neighborhoods is used as an approach to not only increase both physical and mental aspects of the inhabitant's lives(David, Janiak, and Wasmer, 2010). The geographical proximity would thus be a possible indicator of the level of satisfaction that citizens might enjoy in their local municipality. This could especially be interesting in the Netherlands where in recent times municipalities have been forced to fuse in greater ones. This in turn increasing the distances within municipalities as they are physically expanded while the new municipal organization is smaller overall.

Especially of interest to this research are the cities of Groningen and Eindhoven, both cities are of similar area size and population count. Both cities also host a relatively large population of student citizens due to the universities within the city. The interesting difference is that the city of Groningen has recently fused with multiple municipalities while Eindhoven has not.

In the Netherlands, the Leefbaarometer has been created to measure and predict livability inside neighborhoods within municipalities (Leidelmeijer, K., 2014). This data is created using around a hundred different indicators for which data is gathered by the Dutch authorities using questionnaires. These indicators are then combined to create the level of livability in the neighborhood which will be used as an indicator for this research.

Social-economic factors are strong indicators of social cohesion within neighborhoods (Tolsma, van der Meer and Gesthuizen, 2009). This in turn impacts crime and poverty rates which can be considered indicators of unhappy citizens as their basic needs of safety and solvency.

These three indicators will be used in this research to look at a possible correlation between geographical proximity and citizen satisfaction. The use of this research can be that if a correlation can be shown between citizens' satisfaction and geographical proximity this could then be better integrated into the structure of municipalities in the Netherlands especially this can imply how to best restructure municipalities after fusions to best serve their citizens.

Research problem

For this research, a comparison will be made between both the municipalities of Groningen and Eindhoven. These municipalities have been chosen due to their similarities with the exception that the municipality of Groningen is recently fused with two smaller municipalities. Both cities have a similar amount of citizens and area size making them comparable cases. This will hopefully reduce the influence of confounding variables and make the possible outcomes of this research more reliable.

To research this problem the following research question and sub-questions have been made:

- Can a correlation between the satisfaction of citizens, social-economic factors, and geographical proximity be found in the municipalities of Groningen and Eindhoven?

Sub-questions:

- What is the geographical proximity of the citizens to the services of the municipalities of Groningen and Eindhoven?

- What are the social-economic distributions of neighborhoods in the municipalities of Groningen and Eindhoven?

- What are the livability scores in neighborhoods in the municipalities of Groningen and Eindhoven?

Structure of the thesis

In this thesis first, the theoretical framework is explained and visualized in a conceptual model. After this, the methodology is explored on how to gather and analyze the data that is used in this thesis. Then the results of the created analysis are presented and afterward, a discussion has been created to reflect on both the results and the whole process. Finally, a conclusion follows with some remarks for future research.

Theoretical framework

New public management

The concept of new public management has gained widespread use in the world of public administration since its introduction in the 1970s. Many countries in the western hemisphere have changed their public administration strategies based on this concept in a bid to increase their performance levels so that their citizens could enjoy the benefits. NPM has been introduced on all levels of public service from local governance to police forces. But for this thesis, the focus will be on local governance. This definition made by den Heyer(2011), encapsulates the meaning of NPM in the way it is used in this thesis:

The new public management (NPM) philosophy has been described as a move towards a governance approach that emphasizes transparency, performance management, and accountability of public sector employees and managers. The philosophy has been identified as “one of the most striking international trends in public administration” that is capable of re-inventing government(den Heyer, 2011)

There are also researchers more critical of NPM and how successful it is. NPM has been criticized as an inconsistent and poorly defined concept as public organizations can become too ‘business-like alienating citizens and employees due to a high focus on performance and being overly bureaucratic leading to citizens being held up and confused(Diefenbach, 2009).

Citizen satisfaction

Citizen satisfaction is an important metric in measuring the performance of local governance(Van Ryzin, 2006). To test this the expectancy disconfirmation model can be used. This model measures the satisfaction levels of citizens by looking at both expectation and performance levels. By measuring these levels via surveys the disconfirmation, the discrepancy between the expectations and the quality of service received can be determined which in turn leads to the satisfaction levels(Ryzin, 2004).

In the Netherlands surveys measuring this disconfirmation are used to determine the livability score of the Leefbaarometer (Leidelmeijer, K., 2014). These scores have been determined by using around 100 different indicators for which data has been gathered using questionnaires by Dutch authorities. These indicators are used on a neighborhood level for this thesis as this was the most practical level to use for this thesis.

By using these livability scores on a neighborhood level insights can be gained into the satisfaction of citizens with their local governance and by combining this with the other indicators insights might be found as to which of these influence each other.

Geographical proximity to municipal services

Geographical proximity is one type proximity of proximity that can be seen in different views but is mostly seen as a distance between different physical entities(Gil Solá and Vilhelmson, 2019). Increased proximity within neighborhoods to different amenities is associated with

increasing the life of inhabitants of neighborhoods in both physical and mental aspects(David, Janiak, and Wasmer, 2010).

Proximity to amenities is seen as an important factor in the locations that people want to live(Haugen, 2011). Most people prefer to live close to amenities that are important to them especially when these amenities are often used such as grocery stores. Knowing this it is interesting to investigate how the proximity to municipal services might influence living choices and satisfaction with these services.

For this thesis, geographical proximity will be used as a way to measure the distance between the provider(municipality) and the customer(citizen). This is done by marking the locations of service points of the municipality and then creating three concentric circles of 2000 meters around them and a final one for the rest of the municipality to determine four different levels of geographical proximity: High, medium, low, and very low.

Social-economic factors

Social-economic factors are a broad concept that encompasses a lot of different factors within neighborhoods. Due to the complexity and number of different factors that make up the social-economic factors of a neighborhood Scheller (2016) has proposed a hierarchy of needs for neighborhoods. Utilizing mixed methods research consisting of surveys and interviews he establishes what the most important factors are to improving neighborhoods and increasing their social-economic status. At the top of his hierarchy is the improvement of property values as this should lead to the overall improvement of services available in the neighborhood(Scheller, 2016).

Due to the limited scope of this thesis, the average WOZ-value of neighborhoods will be used to determine the social-economic state of all neighborhoods. The WOZ-value is meant to represent the value of the residential property and is calculated by the Dutch government for taxation purposes each year and is used often to gain insights into the socio-economic situation in different neighborhoods(Vries *et al.*, 2016).

Conceptual model

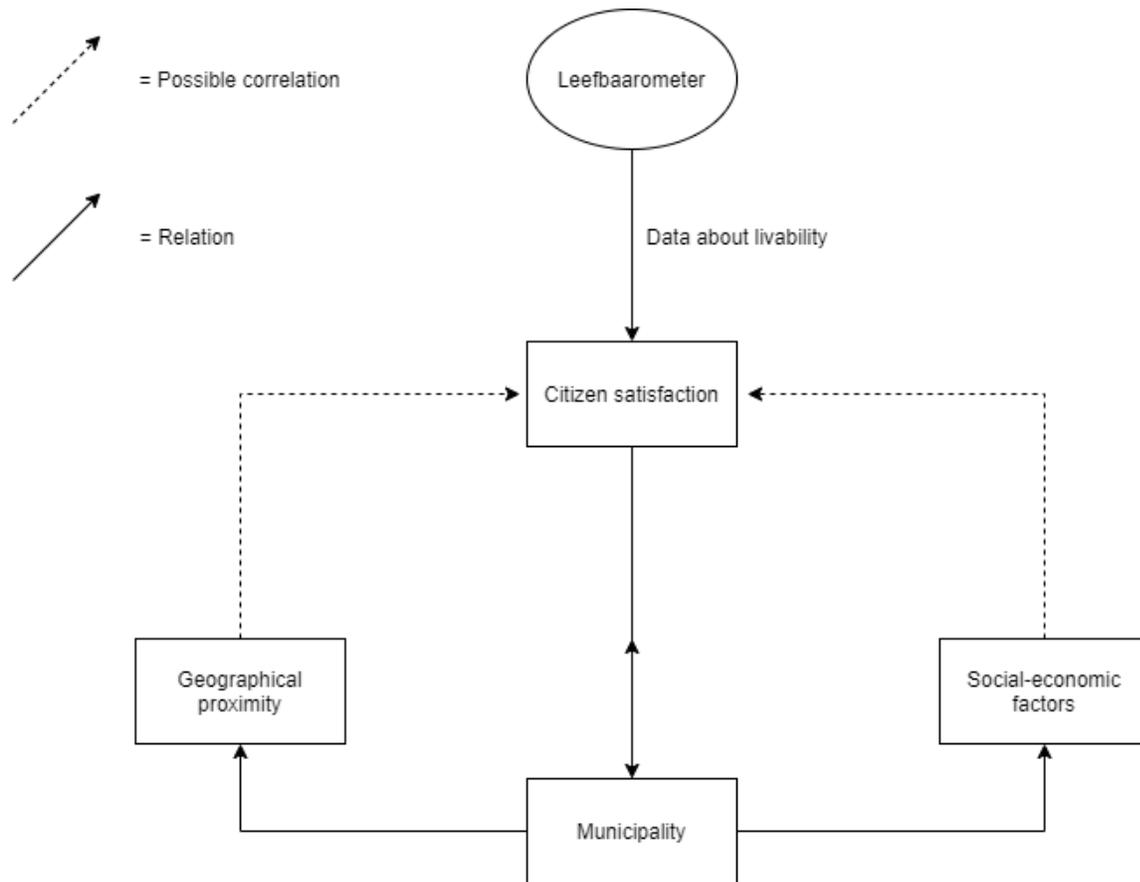


Figure 1: Conceptual model based on the theoretical framework

In this conceptual model, the relations and possible correlations of this research are shown based on the theoretical foundations laid above. It can be seen that two indicators will be investigated for relations with the satisfaction of citizens of which data will be provided by the Leefbaarometer.

Hypotheses

As this is qualitative research comparing two different cases some expectations can be made to the potential outcome of the research. This research into possible correlations the outcome of the research is expected to show that correlations might exist between the satisfaction of citizens in the municipalities and both geographical proximity and social-economic factors. This expectation is based on similar research done about the relationship between customers and companies and the possible parallel of this relation to the relationship between citizen and municipality.

Methodology

To best answer the following research question and sub-questions the following methodology has been devised.

The method of research for this thesis is a case study comparing the situations of two different municipalities. This leads to a qualitative approach using secondary data from different sources. First data is gathered on all the municipal buildings of both municipalities will be determined using GIS data that is publicly available. The multiple addresses found of buildings that house the municipal organization can be found on the website of the municipality and will then be cross-referenced to an ArcGIS file. In this file, a map is made using the BAG (basisregistratie adressen en gebouwen) layer that is publicly available. Using these data points buffers can then be created around these buildings which will create four concentric around these buildings to create a map with an overview of the four categories of proximity: high, medium, low, and very low. Using these maps the first sub-question can be answered: *What is the geographical proximity of the citizens to the services of the municipalities of Groningen and Eindhoven?*

After this data is gathered about the WOZ-value of the residential buildings of each neighborhood to create the average value and gain an insight into the social-economic factors of the different neighborhoods in the municipality. This data is gathered from the CBS which has a database containing the WOZ-values of all residential buildings in the Netherlands. Using this data a new ArcGIS map is created showing the difference in social-economic values between the neighborhoods in each municipality. This then allows us to answer the second sub-question: *What are the social-economic distributions of neighborhoods in the municipalities of Groningen and Eindhoven?*

And finally, data is taken from the Leefbaarometer to create two final maps showing the livability rating of each neighborhood of both municipalities. This in turn leads us to the answer to the final sub-question: *What are the citizen satisfaction levels in the municipality of Groningen and Eindhoven?*

After all these maps have been created an analysis will be done to compare the grading of each of the neighborhoods on each of the indicators to find out if there are possible relations between each indicator. For example, if neighborhoods of lower social-economic factors have lower proximity to municipal services. This final analysis will result in a table that will be used to discuss the final results and answer the main research question: *Can a correlation between the satisfaction of citizens, social-economic factors, and geographical proximity be found in the municipalities of Groningen and Eindhoven?*

Data overview

Data to be gathered	Data source	Analysis method
Geographical proximity	https://groningen.maps.arcgis.com/home/index.html BAG register	ArcGIS tools
Livability	https://www.leefbaarometer.nl/	ArcGIS tools
Socio-economic factors	https://services.arcgisonline.nl/arcgis/rest/services/Demografie/CBS_WijkenBuurten_2018/FeatureServer	ArcGIS tools

Table 1: an overview of the different data sources and their analysis methods

In table 1 the data overview can be seen of all different sources of secondary data. The method of analysis is also shown for the data that still needs further analysis to be useful to this research.

Data analysis scheme

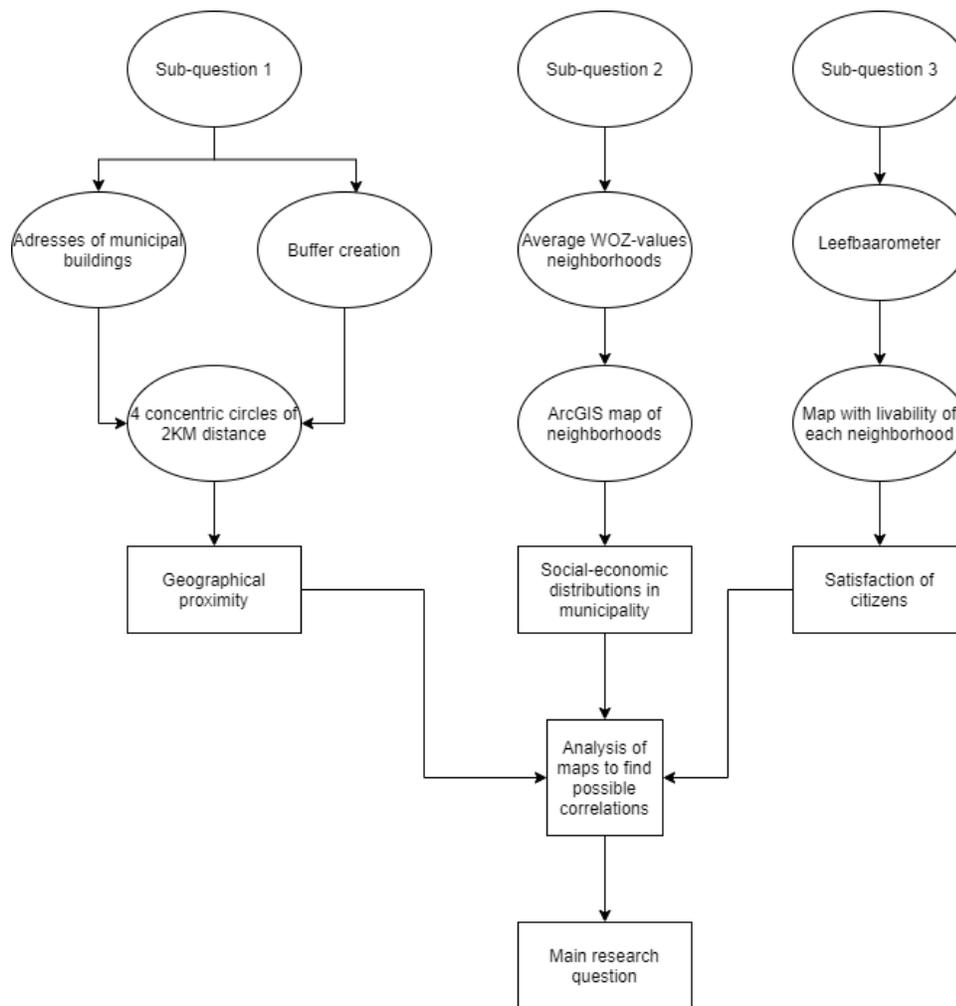


Figure 2: Data analysis scheme created based on the methodology

In this data analysis scheme, a visual overview of how the gathered secondary data is analyzed and the potential answer to the research question can be found.

Results

Introduction to the case-study

To analyze the gathered data a case study has been done. In this case study, the two municipalities of Groningen and Eindhoven have been compared using three indicators: Proximity to municipal services, the satisfaction of citizens, and socio-economic factors. These indicators have been used to create maps showing their levels on a neighborhood level using ArcGIS software and the gathered data. A total of six maps have been created, three of each city to be able to best compare both cities on the three indicators.

Geographical proximity to municipal services

Using the gathered data maps have been created with the use of ArcGIS. This was done by creating buffers around the municipal service buildings in each municipality and then dissolving those buffers to create a polygon containing the total service area of each proximity level within each municipality. The resulting maps are shown below.

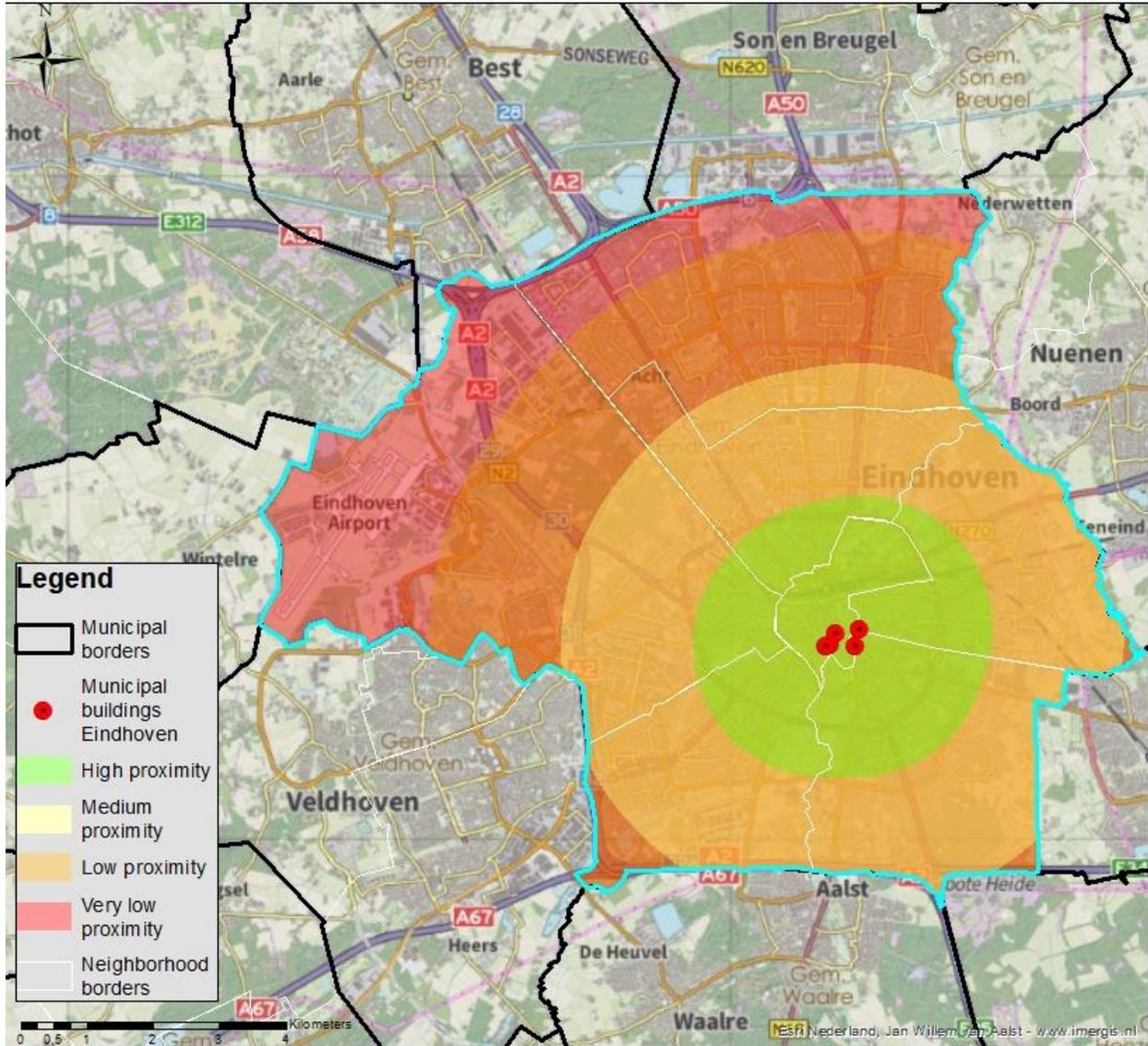


Figure 3: Map of the four levels of proximity in the municipality of Eindhoven

In figure 3 the map with the four levels of proximity in Eindhoven can be seen. Interesting is that the municipality of Eindhoven has not fused with any other municipality and has very centralized municipal services around the town hall.

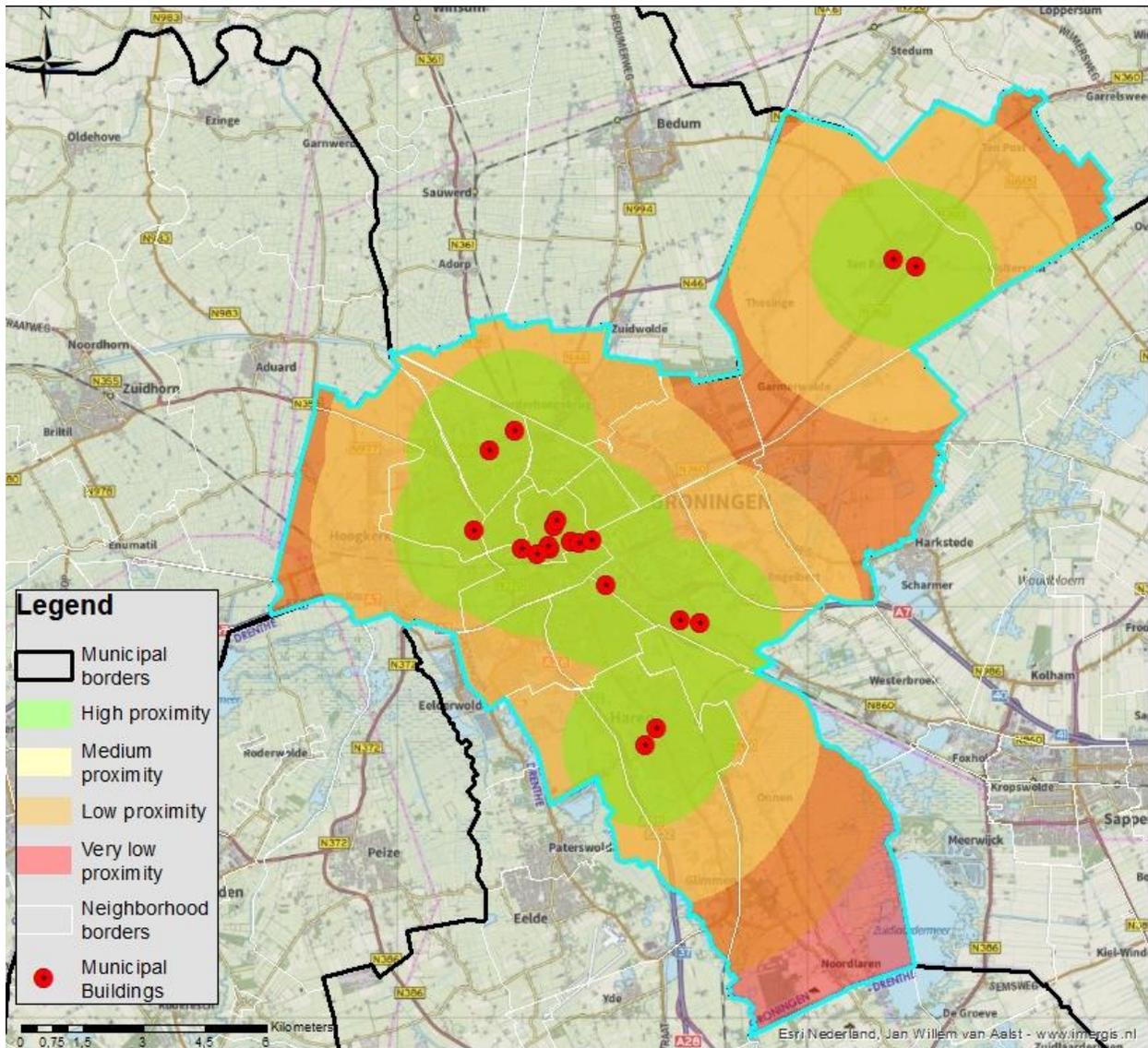


Figure 4: Map of the four levels of proximity in the municipality of Groningen

In figure 4 a similar map as that of the municipality of Eindhoven is shown. The same four levels of proximity are created around the municipal buildings. In the municipality of Groningen, it can be clearly seen that fusions with other municipalities have taken place as their municipal services are more decentralized and some service points of the now-former municipalities of Ten Boer(north-east) and Haren(south) can be clearly seen.

In table 2 below the percentage coverage that each of the four levels of proximity has in each municipality is listed. It can be clearly seen that the municipality of Eindhoven is very centralized compared to the municipality of Groningen as their proximity levels are lower on average.

Proximity level	Groningen	Eindhoven
High	36.8%	17.2%
Medium	41.1%	39.4%
Low	17.6%	40.7%
Very low	4.5%	19.1%

Table 2: A table of the coverage of the four proximity levels in both municipalities rounded to 1 decimal

Social-economic factors

Using the gathered data two maps have been created of the municipalities of Groningen and Eindhoven showcasing the average WOZ-value of each neighborhood. The values stated in the legend are *1.000 in Euros.

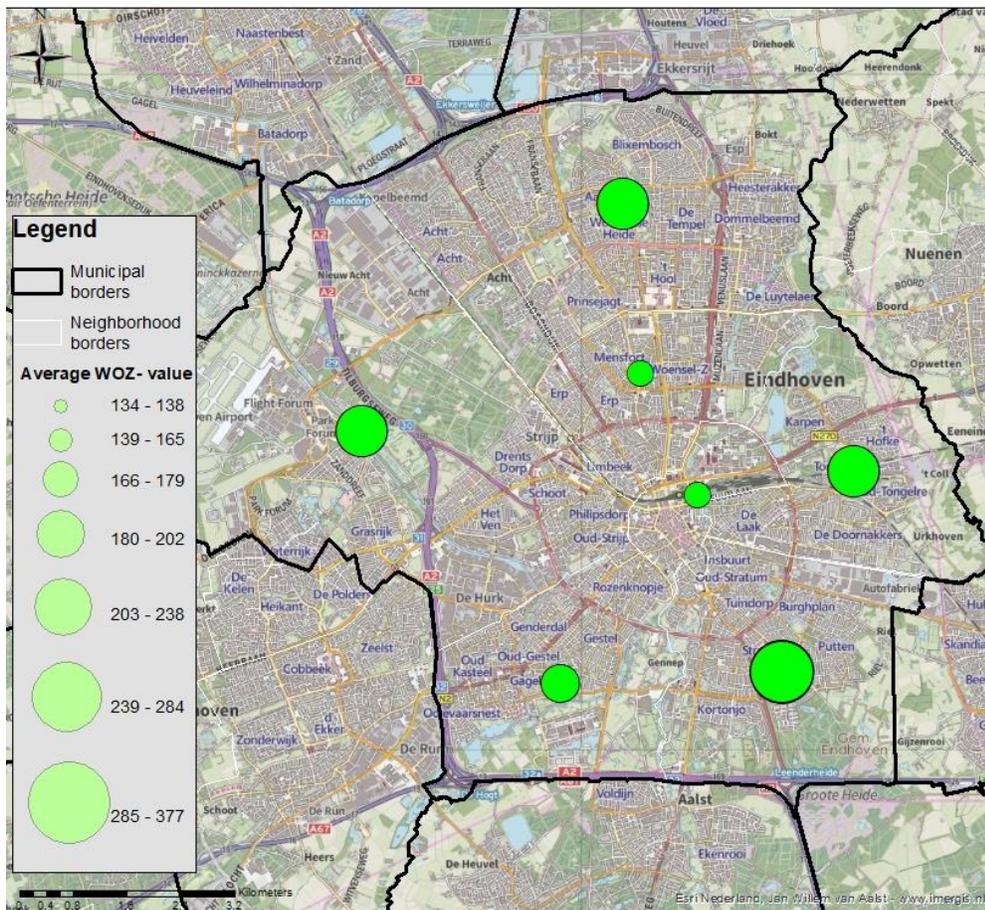


Figure 5: Map of the average WOZ-value in neighborhoods in Eindhoven

In figure 5 the map with the average WOZ-values of each neighborhood in the municipality of Eindhoven can be seen. It is shown clearly that the values in the center of the municipality are the lowest.

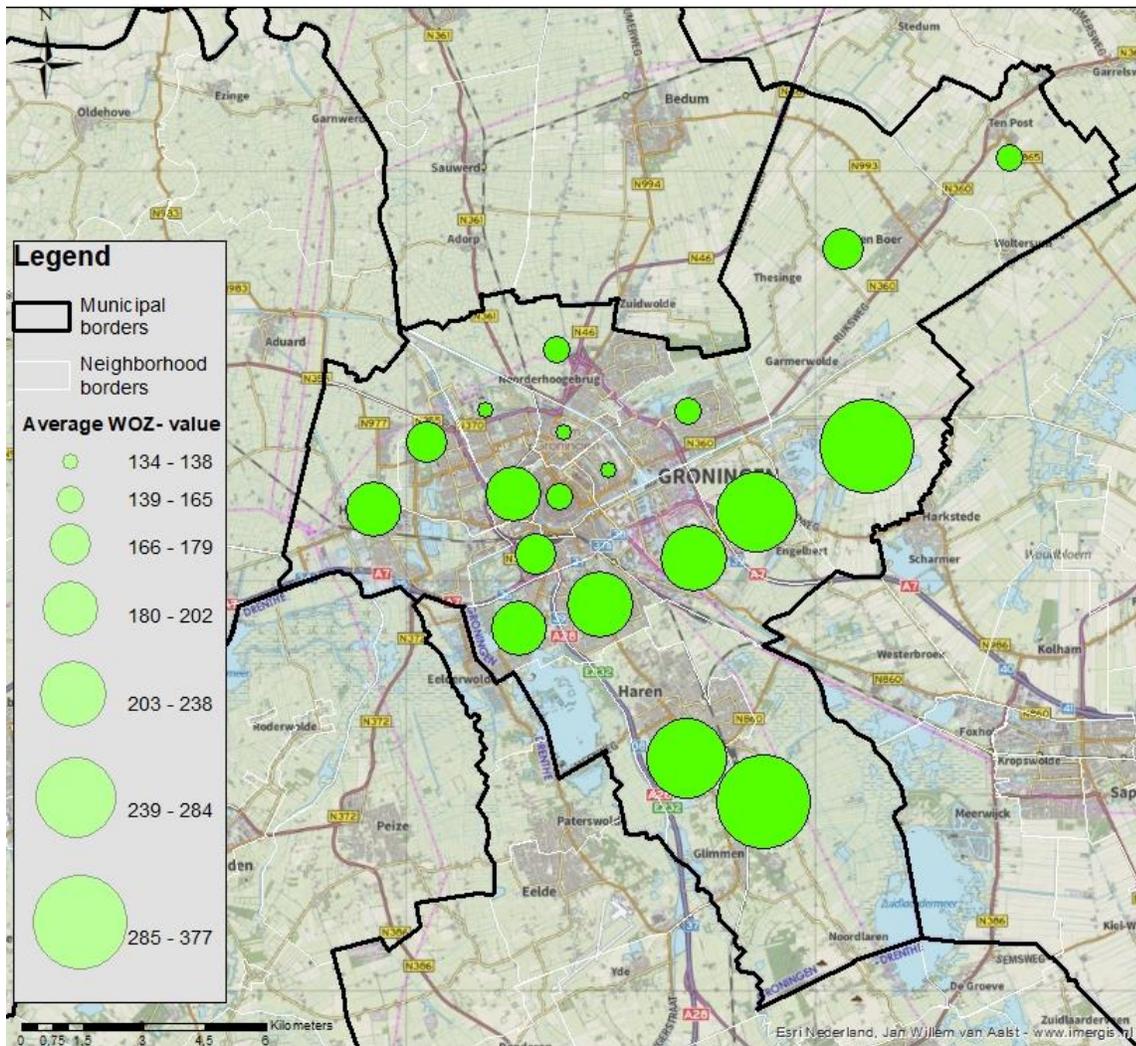


Figure 6: Map of the average WOZ-value in neighborhoods in Groningen

In figure 6 the average WOZ-Value of each neighborhood in the municipality of Groningen is shown. Noticeably the southern part of the municipality has higher WOZ-values than the northern half this can possibly be explained in that this part of the municipality is mostly formed from the former municipality of Haren.

Satisfaction of citizens

To analyze the citizen satisfaction of both the municipalities two maps have been created using the data from Leefbaarometer. This data shows how livable an area is and how happy the people living there are. By using this data distributed over the different neighborhoods in each municipality the final maps are created showing the different ratings ranging from sufficient to excellent as no neighborhood in the dataset has been rated insufficient as of 2018.

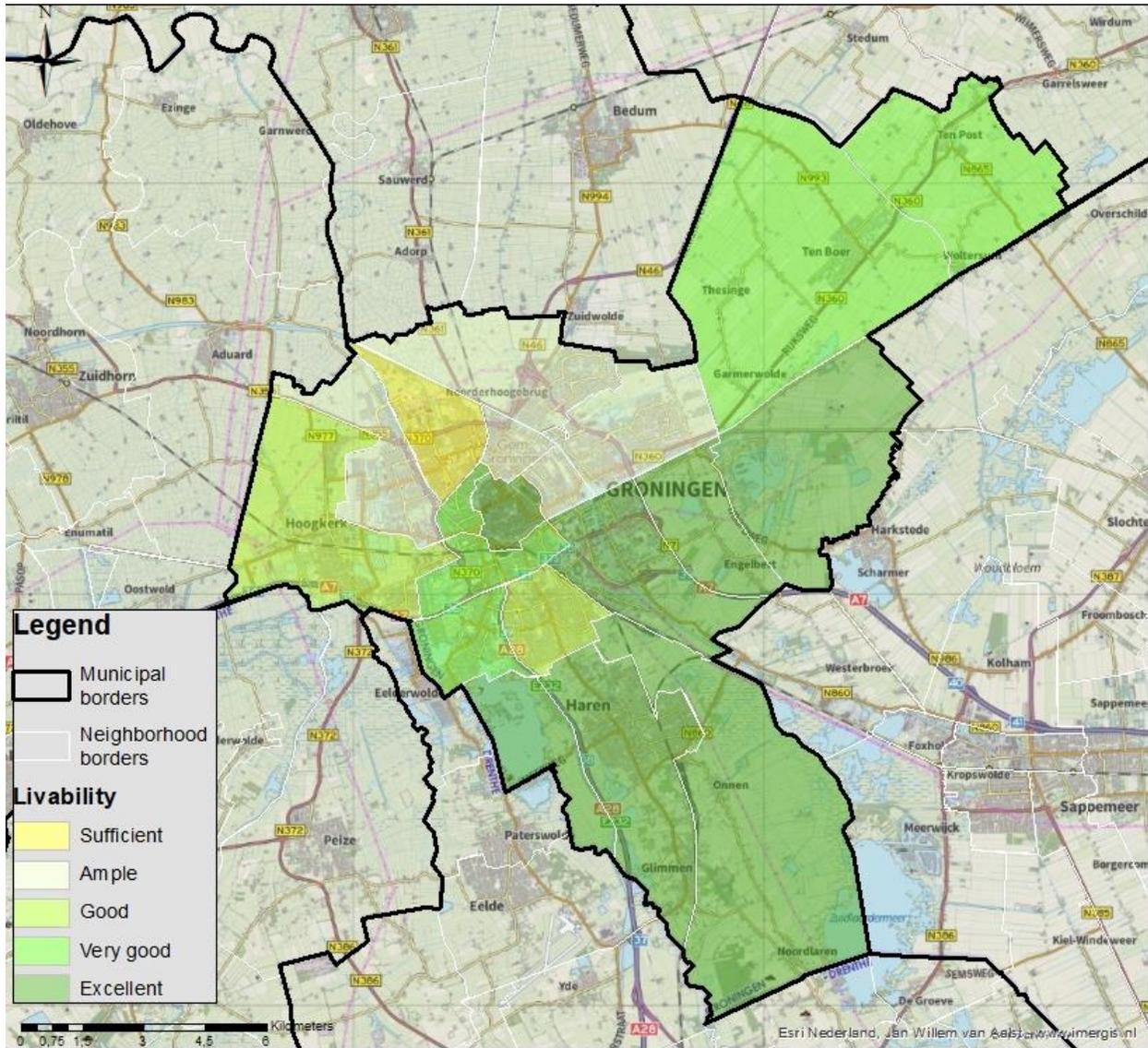


Figure 7: Map of the livability of the municipality of Groningen based on Leefbaarometer

In figure 7 a map of the livability in the municipality of Groningen is shown. The map was created using data from Leefbaarometer giving a livability score per neighborhood. It can be seen that the northern part of the municipality has a lower rating than the other parts of the municipality.

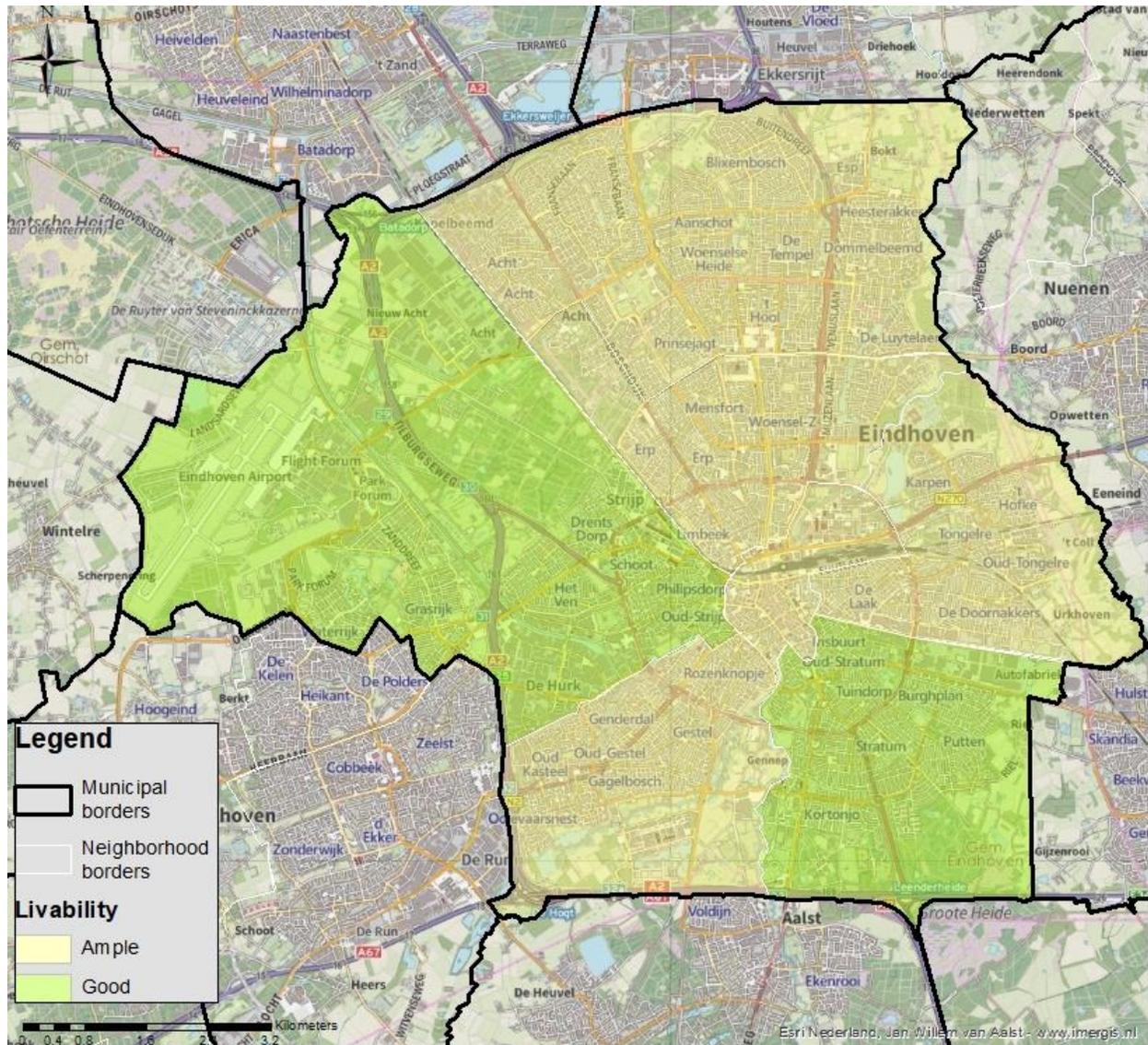


Figure 8: Map of the livability of the municipality of Eindhoven based on Leefbaarometer

In figure 8 a map of the livability in the municipality of Eindhoven is shown. The map was created using data from Leefbaarometer giving a livability score per neighborhood. It can be seen that the city center has the poorest rating while the ratings in Eindhoven are very close overall.

Discussion

Looking at the proximity levels of both municipalities it becomes very clear that the setup of both the municipal services is completely different. Eindhoven has a heavily centralized structure based in the city center. Groningen on the other hand is more decentralized and has split the municipal services more evenly across the different neighborhoods. It can be easily seen how in table 2 how this results in overall higher levels of proximity to municipal services within the municipality of Groningen, most notably having only around one-fourth of the percentage of very low proximity compared to Eindhoven.

The Social-economic factors for both municipalities differ quite a bit as can be seen in the maps. In Eindhoven, the city center is the lowest social-economic area while in Groningen the city center is middle of the pack while the northern part of the city is destitute compared to the southern neighborhoods. It is also worth noting that both municipalities that fused with the Groningen municipality have very different social-economic standings. Haren in the south is seen to have very high social-economic values while Ten Boer in the northeast is more comparable to the average.

The livability ratings in Eindhoven are very similar ranging just from ample to good showing that the satisfaction of citizens over the municipality as a whole is quite similar. In the municipality of Groningen on the other hand bigger differences can be seen. Again the northern neighborhoods are below average while the southern neighborhoods have very high ratings. Overall the average ratings in the municipality are higher than those in the municipality of Eindhoven.

To summarize it seems that there might be a small correlation between the geographical proximity of municipal services and the satisfaction of citizens as in Groningen both the proximity levels and satisfaction of citizens are higher than Eindhoven on average. Furthermore, it can be seen that in both municipalities neighborhoods that have the highest proximity to municipal services mostly have lower social-economic ratings. This indicates that there might be a small correlation between these indicators. Finally, satisfaction ratings seem to be lowest on average in neighborhoods that have the closest proximity to municipal services which contradicts some of the findings mentioned before.

These findings may seem to contradict themselves in this research due to the quite limited scope of the thesis. As an analysis of only two cities has been completed it is very hard to say if these findings would extrapolate to other cities as well as one of these cities may have some strong confounding variables that would only show in the analysis if a case study involving a larger amount of cities is made.

Conclusions

To conclude, it is impossible to make any solid claims towards a strong correlation between geographical proximity and citizen satisfaction due to contradictory findings and the limited scope of this research. However, it can be seen that there is a small correlation between the social-economic factors and the satisfaction of citizens in both municipalities. This correlates with the hierarchy of needs for neighborhoods that rising residential property values are important to the improvement of neighborhoods (Scheller, 2016).

Looking at the social-economic factors it can also be seen that in both municipalities the outer neighborhoods have the highest average WOZ-values which would contradict the research of Haugen (2011) somewhat as they are also on average the furthest from the municipal services. It could also be that other amenities are higher on the order of preference but this would need to be researched more in-depth.

Finally, it can be seen that the northern neighborhoods of Groningen have both the lowest average WOZ-values and the lowest satisfaction values while still having high proximity to municipal services. This could be explained by the citizens living in these neighborhoods not having adapted to the new public management well and thus unable to efficiently navigate the bureaucratic style of the municipality leading to higher levels of dissatisfaction. This would give credence to the criticisms of the new public management by Diefenbach (2009).

Limitations and reflections

The main limitations of this research are the limited scope in both the number of municipalities studied and amount of indicators used to study the municipalities. Furthermore, during the process of this thesis, the workload should have been better distributed to create more space for a better theoretical foundation from the start which would give better confidence in the results.

Position in literature

This thesis shows that social-economic factors in neighborhoods can be seen as a predictor of citizen satisfaction. This in turn shows that policymakers in municipalities should consider improving the social-economic factors in their neighborhoods to increase the satisfaction of their citizens.

Future research

For future research, it would be very interesting to use a wider scope of cities to analyze and/or use a larger amount of indicators such as distance to other amenities or average income to bring more clarity into what relations exist between them and how strong these relations might be. Additionally, surveys could be taken to create a statistical analysis to better understand the results of the relations between these variables.

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