

Do trees affect political preference?

A statistical analysis of the voting behaviour of the population of Utrecht

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Abstract— Do people who live in green neighbourhoods vote greener? The presented research was carried out to investigate the correlation between the greenness in the neighbourhoods of Utrecht and the actual votes on green political parties in the local elections in Utrecht in 2014. Relating to priming theories we propose that greener districts also vote greener. However, the results of our study contradict this hypothesis. The results are nevertheless very interesting since they show the exact opposite of our hypothesis. A strong significant negative correlation was found between the greenness of a neighbourhood and the voting for the green party *GroenLinks*. The residents of the less green neighbourhoods thus vote greener.

I. INTRODUCTION

Maybe you have noticed that once you walk past a butcher a smell of fresh grilled chicken surrounds you, that when you drive along the highway that billboards full of appealing food from fast food restaurants - that are situated along that highway - catch your eye and that in time of elections you cannot cross the street without being confronted with posters on billboards with portraits of the leading politicians printed on it. All these cues are constructed with the intention to influence your choices and behaviour. The presented research is concerned with the question whether unintentional, environmental cues could also provide similar effects.

The question we focus on is whether the "greenness" of ecological regions impact political preferences? More specifically, this research focuses on whether environmental cues influence residents on their political choice towards increasingly green political parties like the Dutch political parties *GroenLinks* and *Partij voor de Dieren*. In order to study these questions, the following research question was formulated:

Do people who live in green neighbourhoods vote 'greener'?

This paper investigates if living in a green district can impact the voting decision of the inhabitants in Utrecht. We approached this question by looking at the existing information about the visible green and the number of trees in the several districts in Utrecht and relating this to the data about the local elections in Utrecht in 2014.

In the following parts, we will first discuss some work that is related to our question of research. Secondly, we will discuss our methods and results after which we will arrive at the conclusion of the research.

II. RELATED WORK

A. Priming effects and Politics

Studies have shown that cues in the everyday environment can have implicit effects on for example consumer behaviour. Studies done by Jonah Berger and Gráinne Fitzsimons show that cues related to a product provided in the environment make this product more accessible and favourable [2]. A fun example of such effects is shown by Michael White in his about the influence of the NASA landing on Mars in Juli 1997 on space-related products. After this impressive and quickly famous landing, the sales of Mars Bars had an unusual increase - although Mars Bars have originally no relation to space since the brand is named after its founder and not after the planet [15]. So, also cues that are mostly associative, instead of reasonable, can have an influence on our behaviour. The effects of these environmental cues can also be called priming effects. A lot of marketing approaches are based on this idea. These approaches propose that when a specific brand was primed earlier, a consumer will be more likely to tend to that choice [2].

A difficulty in the priming literature is the study of these effects in the real world. John Bargh has justly emphasized that although priming studies have provided interesting insights, they are short of evidence from real-world situations where more complex conceptual structures are at work. The real world namely gives many divergent cues at one time [1]. This study is intended to contribute to the growing content about priming effects in everyday situations since the object of our studies consists out of data of real-life situations.

Priming is also a known approach for political communication and political promotion. Priming can be used for promoting a specific politician or for trying to frame the opinions concerning the specific object of discussion [13]. Priming is often viewed in relation to political messages that are communicated through the mass media [14]. This paper does not focus on priming used in communication channels, but on the priming cues that are part of the everyday environment and we maybe will not notice as possible priming cues.

Our research will focus on the geographic distribution of political preference and the role of priming in these different environmental areas. We are not the first to look into the geographic distribution of political preference. However, most theories concerning this field focus on the economic and social differences in different districts [11]. Although we do not deny the interesting implications of such research, we propose to focus on a more basic aspect of the environment: the amount of green in a neighbourhood. Relating to the priming theories

we propose that how much green one encounters in everyday life should affect one's opinion about political green matters.

B. Green neighbourhoods

The effects of green neighbourhoods on its residents has also been an object of several studies. Within the idea of the living environment, the measure of nature is viewed as a vital perspective. Nature adds to cleaner air and at the same time stimulates healthier activities. Research states that in greener situations people report fewer objections, they have better emotional wellbeing and better psychological wellbeing. The sort of green, for instance, ‘agrarian green’ or ‘real nature’, does not seem to matter [14].

Research states that when individuals are in direct physical and psychological exposure to green spaces, this influences their health and wellbeing. Other than a given reprieve from stress, appealing ‘green’ environments may likewise enhance prosperity by improving fulfilment, connection, and responsibility. As a result, these things may upgrade sentiments of social security, and even lessen aggressive behaviour and criminal action. Thus, green environments in the neighbourhood may fill in as a point for positive casual social cooperation, fortifying social ties and along these lines social cohesion [7].

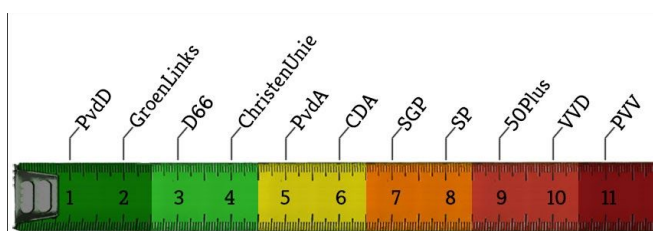
These researches show that besides physical effects, the greenness of an environment can also have an impact on psychological states and attitudes. To this existing body of work about these effects, we want to add the new focus of research: whether green environments can also influence people’s opinions and preferences.

C. Green Politics

An important part of the post-war evolution of European politics was the rise of green politics. The green politics is not only concerned about the environment but also about decentralization, global security and grassroots democracy. The green politics despite their radical core left a mark on the mainstream political competition. In the end, green parties offer a fundamental critique on modern society, calling attention to the environmental, social and human costs of economic growth and technological advancement [3].

This research will be concerned with the elections for the local council in Utrecht in 2014. In the Dutch parliament the Green Politics is currently represented by the parties *GroenLinks* and *Partij voor de Dieren* (see **Table I**) [4, 9]. Both these parties focus on a green, sustainable and healthy environment. Vegetation and the wellness of animals are a high priority of these parties. Both parties also communicate these interests as their most important target points [8, 10].

TABLE I. [4]



Based on the previously mentioned priming theories and green politics, the following hypothesis was formulated for this research:

H: When a district has more visible green and trees, more people vote for GroenLinks and Partij voor de Dieren.

III. METHOD

To test our hypothesis we gathered data from *Buurtmonitor* and *Dataplatform* [5, 6]. A correlation matrix was generated using the statistical software JASP. The matrix is based on the Pearson correlation because the data consists of continuous variables instead of ordinal variables better suited for the Spearman correlation. In order to check whether the collected data is normally distributed a Shapiro-Wilk test is conducted. The dataset is built with data of the city of Utrecht in the year 2014. Samples used in the dataset are the different districts within the city of Utrecht, N=10 (West, Noordwest, Overvecht, Noordoost, Oost, Binnenstad, Zuid, Zuidwest, Leidsche Rijn, Vleuten-De Meern). Every district contains the data of the visible green in square meters per a thousand inhabitants, the number of trees and the percentage of votes for the green parties *GroenLinks* and *Partij voor de Dieren*.

IV. RESULTS

A Pearson’s correlation test was executed between visible green in square meters per a thousand inhabitants and the percentage of voters for *GroenLinks* in a specific neighbourhood of Utrecht, number of trees and voters for *GroenLinks*, visible green and voters for *Partij voor de Dieren* and finally also between the number of trees and voters for *Partij voor de Dieren*. The results of this test are shown in **Table II and III**.

We found a significant negative correlation between both the visible green and the trees and the two parties combined (Visible green: Pearson’s r: -0.835, p: 0.003. Trees: Pearson’s r: -0.699, p: 0.024). A significant strong negative correlation was found between the visible green and the voters for *GroenLinks* (Pearson’s r: -0.834, p-value: 0.003). Also a strong significant correlation was found between the number of trees and the voters for *GroenLink* (Pearson’s r: -0.711, p-value: 0.021). No correlation was found for either the visible green and the voters for *Partij voor de Dieren* or the number of trees and voters for *Partij voor de Dieren*.

TABLE II. PEARSON CORRELATION MATRIX

Pearson Correlations ▼		visible green in m2 per 1.000 inhabitants [permillage]	trees[percentage]	% GROENLINKS [percentage]	% Partij voor de Dieren [percentage]
visible green in m2 per 1.000 inhabitants [permillage]	Pearson's r	—			
	p-value	—			
trees[percentage]	Pearson's r	0.901***	—		
	p-value	< .001	—		
% GROENLINKS [percentage]	Pearson's r	-0.834**	-0.711*	—	
	p-value	0.003	0.021	—	
% Partij voor de Dieren [percentage]	Pearson's r	-0.132	0.167	0.133	—
	p-value	0.716	0.645	0.713	—
% Combined [percentage]	Pearson's r	-0.835**	-0.699*	0.999***	0.174
	p-value	0.003	0.024	< .001	0.630

* p < .05, ** p < .01, *** p < .001

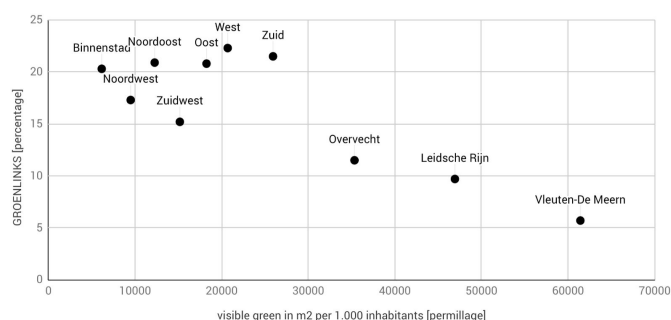


TABLE III. SCATTER PLOT GROENLINKS VOTES VS. VISIBLE GREEN

V. CONCLUSION

The hypothesis that greener neighbourhoods consequently vote in favour of green political gatherings was not supported by our findings. There was no positive correlation between the greenness of districts and the voting for green parties. Pearson's correlation test only reported negative - either strong or very weak - correlations between the two green parties and the amount of green in a neighbourhood. We can therefore conclude that this research does not support the claim that green environmental cues influence the preference towards green political parties positively. However, this research does not support the claim that the green environment has no influence at all on the political preference for green parties.

The outcomes namely shows that it is actually the other way round in the case of *GroenLinks*. The outcomes suggest that people in neighbourhoods with lesser green, vote more often for *GroenLinks*. A possible explanation could be that the people in these neighbourhoods are more confronted with the disadvantages of not having a green environment in their living area and therefore are more likely to vote for a party that focuses on improving the greenness of cities.

Interestingly, this same negative correlation between green voters and green neighbourhoods was not found for the *Partij voor de Dieren*. A possible explanation could be that the name of this party ('Party for the Animals') is not associated as strongly with nature and vegetation as *GroenLinks* ('GreenLeft'). A preference for more vegetation and focus on nature could possibly be more easy to relate to a party with 'green' in their name than to a party which name suggest that it is mostly focused on animals.

VI. DISCUSSION

A disadvantage of our research is that the development of political preference is complex and multifaceted. Since this research was concerning an everyday situation, other factors that influence political preference have not been eliminated from the research. Future research could add to the findings of this research by replicating the results in a more controlled situation.

Since we focused so much on the priming effects of green environments on political preferences, we did not expect the strong negative correlation to occur. This correlation however is fairly interesting. Further research could elaborate on this finding and explore the possible explanations for this negative correlation.

Moreover, future research could add a better separation between the perceived greenness and the objectively measured greenness of neighbourhoods. Perhaps, these different measurements of actual greenness can give more clarity on how voting behaviour can vary.

Another finding that could use some further exploration is that this research did find a significant correlation for *GroenLinks* but that it did not find this same correlation for *Partij voor de Dieren*. It would be interesting to test more different elections and green parties to see whether the negative correlation forms a trend or is a one case event. Since, we did not have access to similar data of other elections we have only focused on two parties during one election in this research.

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