



Leibniz  
Universität  
Hannover

# Analyzing Political Behaviour in the Context of Social Media - An Automated Personality Mining Approach

## Masterarbeit

zur Erlangung des akademischen Grades „Master of Science (M. Sc.)“  
im Studiengang Wirtschaftsingenieur der Fakultät für Elektrotechnik und Informatik,  
Fakultät für Maschinenbau und der Wirtschaftswissenschaftlichen Fakultät  
der Leibniz Universität Hannover

vorgelegt von

Name: Klebansky

Vorname: Michael



Prüfer: Prof. Dr. Michael H. Breitner

Hannover, den 30.03.2020

# Contents

List of Tables .....	III
List of Figures.....	IV
List of Abbreviations.....	V
1. Introduction .....	1
2. Theoretical Background .....	4
2.1 Political Behaviour – Offline and Online .....	4
2.2 The Political Discussion Space on Twitter .....	5
2.3 Political Psychology .....	6
2.3.1 The Political Being – A Product of Context and Inner Dynamics.....	6
2.3.2 Paradigms of Personality Research .....	8
2.3.3 The Big Five Personality Traits.....	10
2.4 Personality Mining with Twitter .....	12
3. Literature Review Based on Webster and Watson.....	15
3.1 Procedure and Methodical Instructions .....	15
3.2 Personality Traits, Political Orientation and Engaging in Discussions .....	16
3.3 Application Areas of Personality Mining .....	23
3.4 Results of the Literature Review and Formulation of Hypotheses .....	28
4. The Brexit Debate on Twitter.....	34
4.1 Methodology and Procedure.....	34
4.2 Data Collection and Preparation.....	37
4.2.1 Twitter Search API.....	37
4.2.2 Data Filtering and Preprocessing .....	39
4.2.3 GET Twitter User Timeline.....	46
4.2.4 IBM Watson Personality Insights API.....	47
4.3 Results and Analysis .....	49
5. Discussion of the Results.....	57
6. Recommendations and Further Research Opportunities.....	62
6.1 For Practice .....	62
6.2 For Research .....	64
6.3 Data Protection Aspects.....	65
7. Limitations.....	67
8. Conclusion and Outlook .....	69
References .....	71
Appendix.....	90
Ehrenwörtliche Erklärung .....	98

# 1. Introduction

With the internet in general and the social media networks in particular, a structural change of political behaviour has taken place. Where the scope of political action was once defined by one's involvement in parties within national borders, new ways of engaging with politics have emerged. With the upcoming of social media, a unique political space developed in which millions of users can simultaneously obtain information and express their opinions on global issues.

A US survey shows that at least one third of social media users discuss, comment or post regularly about politics on these platforms. As an outcome, roughly one-in-five social media users have changed their minds about a political issue because they were influenced by certain information they saw on social media (Duggan & Smith, 2016, pp. 7, 18).

In particular, Twitter established itself as a relevant political social media network over the last years. In addition to the growing interest in this platform thanks to its probably most famous user Donald Trump, who regularly expresses his controversial opinions through tweets, Twitter has become increasingly important for shaping political debates all over the world.

In the first place, Twitter does not primarily offer the user a social network but functions as a public space for spreading information, exchanging views and negotiating the meaning of political happenings in real-time instead. Hence, the majority of tweets and trending hashtags refer to daily political events (Kwak et al., 2010, p. 600). Examples like the Arab Spring or the Umbrella Revolution in Hong Kong show how the communication on Twitter can even help to organize movements in the offline world (Bruns et al., 2013); (Sile, 2015). On the other hand, numerous investigations uncovered how disinformation campaigns spread on the platform in times of elections with the aim to deceive the public opinion (Bradshaw & Howard, 2019).

Regarding the rising disenchantment with politics in recent years, the use of Twitter can also offer possibilities to revitalize the interest in democracy. Giving the users a chance to make their voices heard fosters the development of a political identity and can ultimately enhance offline engagement (Zúñiga et al., 2014, p. 626). To be able to make use of this potential, the question that should be asked is who makes use of Twitter as a space for political expression. Understanding what kind of individuals utilize and vice versa avoid Twitter can help to adjust this environment in a way that also appeals to a wider range of people. Creating the space for an open and fair dialogue, where a broad range of opinions come together, can be the foundation stone for a public and deliberative discourse (Habermas, 1994).

Although Twitter is a popular research topic, specific knowledge about those who leave comments and their motivation to do so is limited. Studies have indicated that the engagement in political discourse on Twitter is asymmetrical. A small but highly vocal group of users is participating in the exchange of views. Those so-called lead users are frequently expressing their opinions about a political issue and seem to mainly hold strong political views (Bruns & Stieglitz, 2014, p. 76); (Barberá, 2015, pp. 86-88). However, even sociodemographic factors,

such as age and education, do not sufficiently explain political commenting behaviour which indicates that other characteristics also play a role (Hoelig, 2016, pp. 399-401).

To gain more insights about the motives for engagement, the personality traits of those who decide to express their political views on Twitter are investigated in this thesis. Research has shown that personality traits influence the way in which individuals engage in a variety of political activities and that one's political orientation is also affected by those dispositional factors (Mondak et al., 2010). With the technical progress in natural language processing and the possibility to derive personality traits from a person's use of words, a vast number of tweets can be processed automatically and thereby knowledge about the personality of a user can be obtained (Golbeck et al., 2011).

In this sense, this thesis seeks to investigate the highly active users on Twitter by taking a personality mining approach to answer three research questions. The first research at finding out the general personality trait distribution among the most vocal users in the political discussion space on Twitter. Since these users frequently express their political views, which also often tend to be extreme, the second and third research questions focus on the link between one's personality traits and the respective commenting behaviour.

**RQ1:** What are the key personality traits of the politically vocal lead users that are expressing their opinions on Twitter?

**RQ2:** Is there a relationship between the personality traits of the lead users and their commenting behaviour in terms of the frequency in which they express their opinions?

**RQ3:** Do the personality traits of the lead users offer insights about their commenting behaviour in terms of the political orientation they express?

The structure of the thesis is shown in figure 1. Following the introduction, a theoretical understanding of three areas is provided in the second chapter. First, political behaviour is defined in the offline and online context to then explain the specifics of the political discussion space on Twitter with its lead users. Second, an introduction into political psychology follows which deals with personality traits as one of the central inner factors affecting one's decision-making. Third, the personality mining process on Twitter is outlined. Afterwards, two literature reviews based on Webster and Watson are executed in chapter three. From the findings of the literature reviews, hypotheses about the lead users' personality traits in regard to the research questions are formulated. Additionally, a personality mining tool for the subsequent analysis is chosen. Chapter four forms the main part of this thesis, where the hypotheses are statistically evaluated using collected data from the intense Brexit debate on Twitter – the discourse about the United Kingdom's (UK) official withdrawal from the European Union (EU) on the 31<sup>st</sup> of January. The obtained results are then critically discussed in chapter five before recommendations and further research opportunities are outlined in chapter six. After stating limitations in chapter seven, a conclusion is drawn and an outlook is given on potential future research directions.

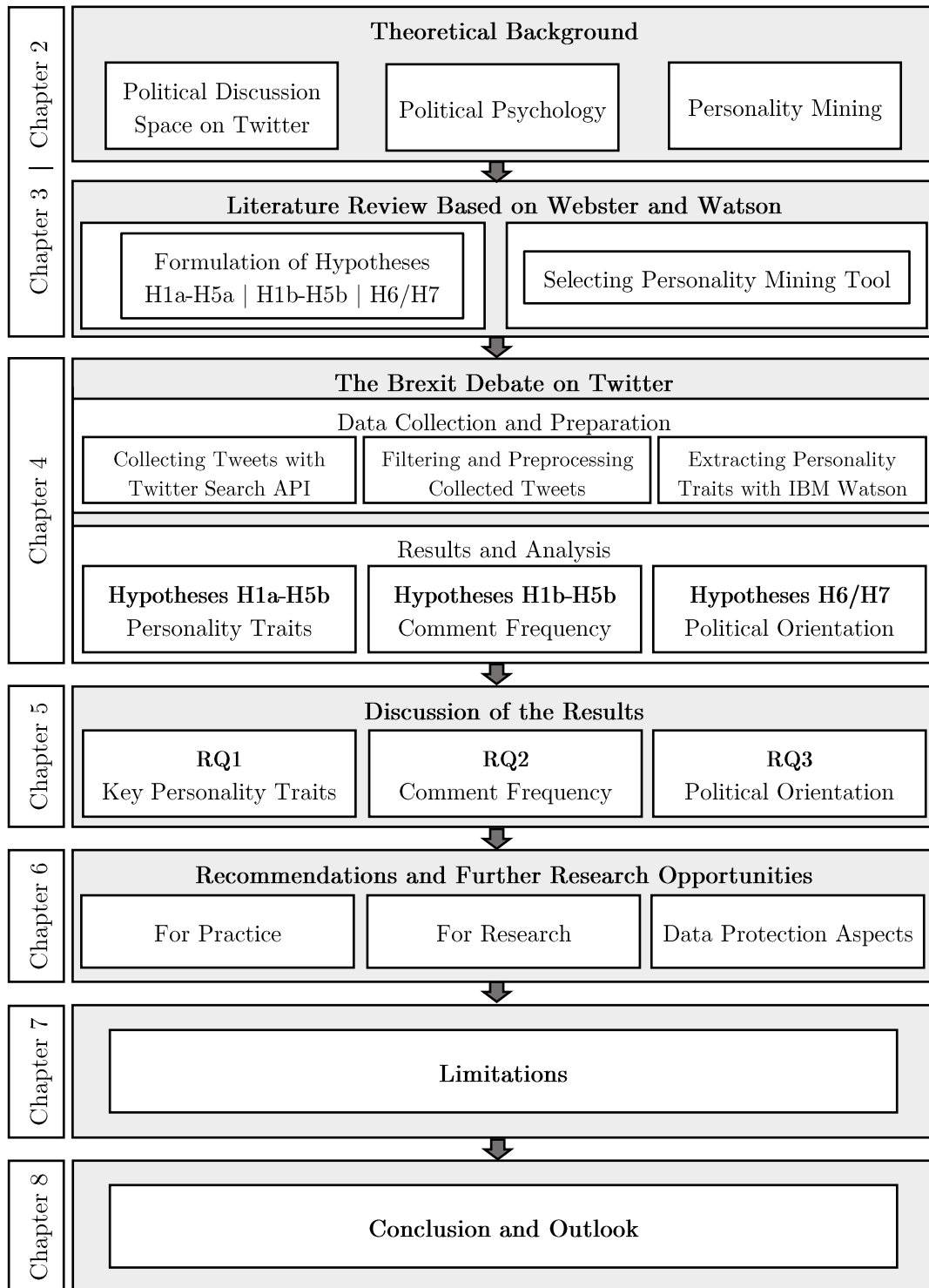


Figure 1: Structure of the Thesis  
Source: Own Illustration

## 8. Conclusion and Outlook

The political space on Twitter is often viewed in a negative light due to the rising numbers of disinformation campaigns on this platform trying to manipulate the public opinion. Although this is certainly a serious problem which has to be solved, Twitter also offers individuals from all over the world the possibility to express their political opinions and participate in discussions. In combination with Twitter's characteristic hashtag culture, the platform can provide a space for an open political dialogue where not only the political elite but especially voices from the general public can be heard.

In this regard, this thesis aimed at improving the understanding about those who express their political views on Twitter and their potential motives for doing so from a personality perspective. From the literature reviews, it was found out that personality research has mostly focused on political behaviour in the offline world so far. No specific focus has been placed on the personality traits of those who engage in political debates online. Hence, hypotheses about the personality traits of the lead users and their commenting behaviour had to be formulated based on the existing findings from personality studies targeting offline behaviour.

Since the Brexit discussion between the 29<sup>th</sup> of January and the 2<sup>nd</sup> of February was the most polarizing topic on Twitter, tweets that referred to the UK officially leaving the EU were collected for the evaluation of the hypotheses. In this context, personality traits of the 800 users that expressed their opinion most frequently about the Brexit were extracted with IBM Watson Personality Insights, a personality mining tool that was found to be commonly used among researchers.

On the one hand, the analysis of those 800 lead users and their personality traits revealed that especially open users as well as disagreeable and less conscious individuals participated in the discussion on Twitter. Conversely, agreeable and more conscious individuals avoided to comment on Twitter which suggests that this political space might be too conflict-prone for agreeable and not structured enough for conscious individuals. Those results are in line with previous findings from the offline world which indicates that no personality differences are present for those specific traits when it comes to expressing political views in offline discussions and online discussions. On the other hand, contrary to the hypotheses, it was found out that more introverted as well as neurotic individuals joined the discourse. Apparently, political debates on Twitter seem to attract individuals that tend to shun interpersonal communication in the real world and thus switch to the anonymous online world to find the possibility to express their opinions and to interact with other people.

Regarding the commenting behaviour of the lead users in terms of the frequency with which they participated in the debate about the Brexit, several key results came up. Statistically significant positive relationships were found between the frequency of commenting and Extraversion, Openness as well as Conscientiousness. Those determined relationships replicate the findings from the offline world which suggests that this correlation might hold regardless of the context in which an individual decides to engage in discussions.

As this analysis also aimed at examining the political orientation of the lead users and their personality traits, 150 users strongly endorsing and 150 users strongly refusing the Brexit were identified. The found results suggest that in the political space on Twitter there might be in fact the tendency of open individuals to express more liberal and pluralistic views whereas conscious individuals tend to focus on nationalistic and protective values in their comments.

Overall, this thesis represents a first exploratory attempt to gain insights into the personality structures of those who express their opinions on Twitter. In this sense, the results which were found relate to one lead user group referring to one political issue and thus the findings should not be generalized or misinterpreted as causalities. To better understand the implications and validity of these findings, future studies should analyze additional political debates on Twitter and the users that decide to participate in them to determine whether those results can be replicated or differences might arise.

In sum, it can be concluded that the participation in the political debates on Twitter appears to be asymmetrical from a personality perspective. Individuals with particular personality characteristics expressed their opinions more often than others. This might be problematic in the sense that certain political views prevail on Twitter and thus an unbalanced opinion landscape develops.

As suggested in this thesis, to promote a diverse and open dialogue where a variety of different voices is heard instead, it is necessary to understand the reasons why some individuals avoid this political space and which obstacles need to be removed so that a public space for deliberation can emerge. In this regard, additional options for the graphical user interface, stronger policies against hate comments and measures against the dissemination of false information with bot networks should be explicitly evaluated from researchers, politicians and Twitter.