Climate Change Communication on Twitter

Influence of Media Logic

Titas Pilka

Master thesis, 15 hp
Media and Communication Studies
International/intercultural communication
Autumn 2017

Supervisor:
Anders Svensson

Examiner:
Leon Barkho
This study examines how media logic of news reporting influences climate change journalism on Twitter. It is of great importance that the information about climate change is being properly communicated to the public. However, it is often problematic to send the right message to the public, that would result in public acting towards protecting environment. This happens due to media logic of news reporting that impacts the way climate change is presented by the media. However, previous research indicates that the audience is more likely to trust journalists on Twitter, meaning that is likely for climate change to be represented more accurately there. For this reason, this thesis examines whether this is the case with environmental journalism on Twitter. The aim of this research is to identify the impact of Twitter’s counter-hegemonic discourses towards climate change reporting, to what extent they affect media logic of news reporting. This is done by conducting quantitative content analysis on environmental journalists’ tweets about climate change. Journalists are divided into two groups for comparison of influence of media logic: staff and freelance journalists. The findings demonstrate that when in it comes to credible reporting, staff environmental journalists are less likely to oppose media logic in comparison to freelance journalists. Additionally, neither type of journalist is likely to oppose media logic when it comes to providing public participation promoting reporting. Research is based on Altheide’s theory of media logic.

Keywords: climate change, media logic, Twitter, media credibility, participation.
# Table of contents

Introduction ......................................................................................................................... 5

Background .......................................................................................................................... 7

List of researched US news organizations ........................................................................ 7

List of freelance journalists whose Twitter profiles are examined in this study .................. 7

Social representations ........................................................................................................ 7

Agenda-setting ..................................................................................................................... 7

Aim and research questions ............................................................................................... 8

Previous research ................................................................................................................ 9

Research about media logic’s influence on journalism ....................................................... 9

Research about environmental journalism ........................................................................ 10

Research about journalistic practices on social media ....................................................... 12

Theoretical frame and concepts ......................................................................................... 14

Media Logic .......................................................................................................................... 14

Media Credibility ............................................................................................................... 15

Participation ....................................................................................................................... 16

Method (and material) ........................................................................................................ 17

Material and selection ........................................................................................................ 17

Content Analysis ................................................................................................................ 18

Codebook ............................................................................................................................ 18

Research process ............................................................................................................... 21

Quality of research ............................................................................................................. 21

Reliability and validity ....................................................................................................... 21

Findings and analysis ......................................................................................................... 22

Table 1 – Describing process ............................................................................................. 22

Table 2 – Referencing science .......................................................................................... 24

Table 3 – Unbalanced reporting ....................................................................................... 25

Table 4 – Tweets not confusing weather .......................................................................... 26

Table 5 – Global reporting ............................................................................................... 27
RQ 2 - Do environmental journalists on Twitter communicate climate change in a way that makes audience more likely to trust them? ................................................................. 32

RQ 3 - Do environmental journalists report climate change in a way that makes the audience more likely to participate in tackling on Twitter reported issues such as climate change? ................................................................. 34

RQ 1 - How climate change communication on Twitter is influenced by media logic of news reporting? .................................................................................................................. 36

Conclusion ........................................................................................................ 38

Contributions of the study .................................................................................. 38

Limitations of the research .................................................................................. 38

Suggestions for future research ........................................................................... 39

References ......................................................................................................... 40

Appendix – Interpretative issues ......................................................................... 44
**Introduction**

Majority of us find out about major issues facing the world from the media. One issue that stands out from the rest and is a popular topic in the US is climate change, or otherwise called global warming. It is undoubtedly the most immense environmental issue in contemporary society, as there is an agreement across scientific community, that this change has destructive impact for all life on the planet. Moreover, it has been announced, that the average temperature of previous century was the highest one in climate recording history (Mann, Bradley & Hughes, 1998, as cited in Jaspal & Nerlich, 2014). For this reason, this becomes a major political issue on how to reinforce certain policies to mitigate CO2 emissions which are the main contributors to raising temperatures. The development of the necessary policies dealing with climate change requires common debates among the citizens (McIlwaine, 2013). For this to occur, climate change reporting must be that of the highest quality, to lead to these public discussions (McIlwaine, 2013). Nevertheless, such journalism is a difficult challenge, because of complexity of global warming concept itself. We are more likely to believe climate change to be a natural phenomenon, rather than be induced by human activity (Lewis, 2013).

Another reason why it is difficult achieve this quality climate change reporting is due to limitations of news reporting coming from existing logic of the media. The discourses of the media make it complicated to accurately present something that does not exist within the logic (Hansen, 2010). For example, climate change is often reported as an event rather than a process, because that is what media logic of news reporting is about (Olausson, 2011). It is not catered towards explaining complex processes (Olausson, 2011). Berglez (2011, p. 450) describes this type of logic:

> In the process of news production, various raw materials are transformed into media discourse in accordance with a particular logic. The term ‘logic’ could be filled with various contents, depending on what aspects of media are discussed.

In addition, Lewis (2013) points out that news reporting is often oriented towards innaective solutions to the challenge posed by climate change. The focus is on different ways technological improvements can make energy use more sustainable. Lewis (2013) states this to be an effect of over-consumption of goods, steming from consumerism culture. News, on the other hand, promotes this culture. For this reason, we need public to get more involved: have debates about it and take the right action in reducing their carbon footprint. Thus, study that is beneficial, regarding public participation in climate change dilemma, is about the type
of environmental communication journalists should indulge on social media to make people as active in this issue as possible.

The raising popularity of climate change topic lead to considerably higher number of social science studies about it (Olausson & Berglez, 2014). Majority of the research focuses on media content of environmental news in mediums like newspapers, magazines or television. There are not that many studies researching environmental reporting on social media, which has nowadays became a common way where people get news about present issues (Arceneaux & Weiss, 2010). What is interesting is that communication on Twitter provides journalists new opportunities to present information differently, as the platform allows journalists to form relationships with their audiences compared to traditional media. Research shows that the trust of journalists on Twitter is higher than on other platforms (Gil De Zúñiga, Dieh & Ardèvol-Abreu, 2016). Furthermore, journalists for the audience appear to be unbiased, due to relationships, that are possible to create on such platforms (Gil De Zúñiga et al., 2016). These relationships are possible, because social media allows dialogical form of communication. This type of dialogue is often more informal, as it is less restricted by media logic of news reporting. Therefore, it is important to comprehend what are the best ways to convey knowledge on Twitter, that would transform into action. Such knowledge about Twitter leads to hypothesize that citizens are likely to display more confidence in reports about environment and in what actions they should take. Although, people trust journalists more on Twitter, than on other mediums, it is still unknown how to use this platform as efficiently as possible (Gil De Zúñiga et al., 2016). A prerequisite for this efficiency is journalists reporting in a trustworthy way and reporting in a way that promotes audience participation. In short, it is the kind of reporting that contradicts media logic of news reporting.

This research investigates the influence of media logic's on climate change reporting on Twitter. It does that by examining environmental journalists tweets about climate change and inspecting whether these tweets have the necessary features for appropriate climate change communication. These features are determined based on numerous studies about what is necessary for accurate climate change reporting. In this research, journalists are broken down in two groups – staff journalists and freelance journalists. This classification is done based on existing research pointing out to freelance journalists using social media platform in a different way than their counterparts (Holton, 2016; Edstrom & Ladendorf, 2012; Ladendorf, 2012; Solomon, 2016). The reason why this is done is due to freelancers being flexible and focusing on building their personal brands (Holton, 2016). Firstly, they use social media to engage with audience and provide reporting according to audience's needs, as they believe this create more work opportunities (Holton, 2016). Furthermore, climate change
requires specialized knowledge and freelancers are more likely to be better educated in specialized topics than staff journalists (Edstrom & Ladendorf, 2012). This evidence leads to suggest that media logic of news reporting are not as apparent for freelancers.

Background

List of researched US news organizations


List of freelance journalists whose Twitter profiles are examined in this study

The following freelance journalists have been chosen: Wendy Koch, John R Platt, Colette Derworiz, Alex Steffen, Bryan Nelson, Todd Woody, Sophie Yeo.

Some of these journalists were previously employed in news organizations like National Geographic, USA TODAY, Calgary herald.

Social representations

One theory that is taken into consideration are social representation theory, as these representations could have implications for research results. They are created by individuals interacting with social structure, which they constantly change and are influenced by it (Höijer, 2011). By communicating climate change in a certain way, journalists create social representations, thus affecting the way their audiences perceive such problem. Existing beliefs like - climate change is something that is debatable, creates a common sense about it, which influences social structure. Höijer (2011) describes social representations as something that comes from society, hinting that it is all about cultural symbols. Social representation are not products of logical processes, but rather of mixed contradictory thoughts about things and those thoughts are defined by distinctive ways rationalizing (Höijer, 2011). The possible impact of social representations on this research will be discussed in ‘Findings and analysis’ part of the thesis.

Agenda-setting
Agenda-setting is of concern about media impacting the way their audience thinks about reported issues (McCombs & Shaw, 1972). This theory is applied during analysis of research results to test possible impact of media’s agenda on climate journalism. Such impact is important to consider while analysing reasons of research findings, because media influences what people think and talk about (McCombs & Shaw, 1972). This creates public's dependency on media, so that they would receive coverage on things they talk about. This implies, that the media could be more likely to communicate climate change in a way that people would prefer. In addition, this theory is used to determine how journalists influence the public. On social media, this influence is different, as such platform changes information receiving process. Thus, agenda-setting theory is important for this research for theorizing about how journalists influence the public on Twitter. Media and agenda-setting connection when it comes to reporting about climate change could be explained through looking at this from perspective of media establishing pre-existing agenda based notions of climate change that filter scientific findings (Olausson, 2011). This makes audience's views of environmental directly related with media's set agenda.

**Aim and research questions**

Research problem – There is a lack of information on whether the advantages for communicating climate change on Twitter are being fully utilized by environmental journalists and whether this application depends on the influence of media logic of news reporting.

The **aim** of this research is to identify the influence of Twitter’s counter-hegemonic discourses towards climate change reporting, to what extent they affect media logic of news reporting.

The following research questions (RQ) are necessary to answer during this research to be able to accomplish the aim of this research:

- **RQ1** How climate change communication on Twitter is influenced by media logic of news reporting?
- **RQ2** Do environmental journalists on Twitter communicate climate change in a way that makes audience more likely to trust them?
- **RQ3** Do environmental journalists report climate change in a way that makes the audience more likely to participate in tackling this global issue?
RQ2 and RQ3 are necessary to answer first to be able to answer the main question of the research (RQ1).

**Previous research**

Scientists currently dispute whether rampant mindsets and beliefs of the public should be considered by climate change communicators (Jaspal, Nerlich & Cinnirella, 2014). Outlooks of social sciences on global warming are geared towards gaining intelligence on how this climate issue is characterized in society and how those representations are being perceived by the public (Jaspal, et al., 2014). To gain knowledge on prevailing environmental communication on social media, it is firstly important to look at the research on general journalistic practices that occur on social media.

This research examines US environmental journalists most recent tweets about climate change as of 30/04/2017. To conduct proper research, previous research about differences between freelance journalists and those that are employed by news organizations will be explored. Furthermore, research about journalistic practices on social media and research about qualities of proper environmental reporting will be inspected.

**Research about media logic’s influence on journalism**

While conducting research on media logic’s influence on climate change reporting on Twitter, it is firstly important to consider research that examines the relation between quality of reporting and media logic. This connection shows the significance of media logic on climate change reporting and more specifically how less influenced freelance journalists can report differently and possibly in a more accurate way, as it was mentioned in the ‘Introduction’.

One of the most significant study for understanding media logic’s influence journalists reporting is about how climate change is communicated by the most influential Swedish journalists and what role media logic plays in construction of news reports (Berglez, 2011). This is done by interviewing environmental journalists. The research is conducted by using concepts of media logic and journalistic creativity. Analysis of interviews find that journalists seek to reproduce media logic, mix it with science and implement new type of reporting. This is useful for this thesis, because it highlights how climate change reporting relate with media logic. Furthermore, it helps to answer important questions like how different journalists are affected by this logic and how they perceive it? This relationship, between media logic
influence on journalists’ perception of it, is essential in understanding whether freelance journalists are more likely to act by certain media logic. If they are more likely to be aware of this logic, that would allow them to perform better climate change communication on social media.

Study (Plesner, 2010) on performativity of media logic is necessary for this thesis, as the established analytical framework determines how climate change reporting is affected by different actors, of whom involvement vary when journalist is a freelancer. The aim of the study (Plesner, 2010) is to investigate the use of the term ‘media logic’ and how valid it is as explanation in different situations. The research method is interview, which is based on four different case studies. 19 people were interviewed among whom were editors, journalists and researchers. Media reports, that were written by those actors cooperating, were analyzed as well. In addition, other texts referred to by those actors were investigated. The research is based on theory of actor-network. The study finds, that media logic is influenced by relation of different actors, and those include scientists. Every actor, according to the findings of interviews, plays part in constructing this logic. Therefore, it is not an already actualized force that define actions.

Research about environmental journalism

Another research to consider while studying sustainable communication on social media is about how media represents climate change. Comprehension of common media social representation of the issue and people’s responses to them allows further investigation on how such relationship appear on social media. Do these social representations appear on platforms like Twitter, or are they only common on traditional media? If that is the case, then it would mean, that climate change representations have little to do with prevailing media logic and the influences behind it. Research (Jaspal et al., 2014) on human responses to representations of environment on traditional media and climate change indicates, that looking at the process of identity provides information on ways citizens create social representations of climate change, and how they should act. It is conducted by using social representation theory and identity process theory. Jaspal et al. (2014) provides theoretical perspective by analyzing previous research. This theoretical framework connects contemporary debates on identity and social representation and applies them to climate change communication.

Other research (Fischer et al., 2012) in this field examines how people perceive environment and what kind of social representation they create of it. Research is conducted by qualitative
interviews of people from five European countries and it is based on social representation theory. Fischer et al. (2012) findings are useful for thesis research, as it provides more knowledge on how climate change perception changes while news about it are received on social media. Moreover, it helps to comprehend what level of public participation can be achieved on social media.

Another significant study (Brüggemanna & Engesserb, 2017) provides the necessary information for this research on how media represent climate change from the perspective of media’s attention to contrarian views on the issue. While examining how journalists communicate about climate change, it is possible to see whether this trend of balanced reporting in this case remains on social media. Findings of the study show interpretative model of journalism to be dominating over journalism that seeks to provide balanced views (Brüggemanna & Engesserb, 2017). Furthermore, balanced reporting is becoming less common. The study is performed using content analysis and news value theory.

Focus-group study (Olausson, 2011) including 53 Swedish citizens aims to gain more empirical knowledge on the link between media content of climate change and audience’s reception of it, as majority of the research reduces ramification of this link. The research is based on social representation theory to combat “media-centric” approach that is common with majority of the studies in the area. The research finds out to audience being very likely to oppose media’s representations and media is playing a role as an “agenda-setter”. Findings of this article contributes to thesis research in a way that it presents quality climate change reporting features and how the public is affected by media’s representations of climate change and that people are likely to see uncertainty in climate change science. More specifically, how media’s tendency to focus on local reporting, to confuse weather with climate and other tendencies affect public’s understanding of climate change.

Critical discourse analysis (CDA) of three daily Swedish newspapers framing of climate change is valuable for thesis research, as it indicates the importance of inclusion of climate change adaptation discourse in media reporting, as it is one of the features of quality environmental journalism (Olausson, 2009). The study aims to find media attribution of accountability to collective action frames of climate change by using framing theory. Results show media reporting to have no connection between frame of adaptation to climate change and frame of reduction of greenhouse gas emissions, as these frames rarely appear in the same context of news. In addition, the study finds out that analyzed articles are reinforcing political environment in which they operate and connection between national and international reporting of climate change.
McIlwaine (2013) analyzes shortcomings of climate change reporting. According to analysis, the public still lacks the necessary comprehension of climate change. Journalists do not understand the basics of climate science. This analysis is useful for thesis research for comprehension of the difference between general and specialist climate change reporters. The main difference is that with general journalist there is usually bad quality climate change reporting, because features like balanced reporting and confusion between weather and climate appear in their reporting, as oppose to specialist journalists that are more aware of the science behind climate change. This allows them to provide better quality reporting.

Research about journalistic practices on social media

Another applicable study for this research is a survey examining social media adoption by journalists. Results showed, that social media usage by journalists across countries have no significant difference (Gulyas, 2016). Knowing how journalists approach adaptation of social media journalism helps in gaining better understanding on the ways social media platforms like Twitter affect how journalists construct their reports. Gulyas (2016) findings could be applied internationally, as the trends of social media usage across all the examined countries have no significant difference. This is due to constrains that come from the platforms themselves. Furthermore, research contributes to this thesis in a way, that it helps to set connection between Twitter adoption and the prevalent discourses in tweets. To what extent discourses, that are apparent in environmental journalists’ tweets are affected by their ways of adapting to this platform? The answer to this question would help to determine whether adoption strategies must be changed to improve environmental communication on Twitter.

Russel, Hendricks, Choi & Stephens (2015) examined how messages are being shared by journalists on Twitter and found out that journalists on Twitter tend to interact more with other journalists, than with the public or government sources. This shows that they are taking an easy approach and not using social media platform to its full advantage for maximum engagement from citizens and government. Russel et al. (2015) conducted research by performing content analysis on 1175 tweets of 40 journalists. It is based on agenda-setting theory, and shows journalist agenda to be getting as many people to news media sites as possible. The findings of this content analysis help thesis research by providing significant amount of data about how journalists approach communication on Twitter.
Another study, that is beneficial for this research is the one, that is of concern about openness of journalists on Twitter (Vivo, 2013). Study focuses on the openness of journalists on Twitter drawing on gatekeeping theory and end-user journalism concept. Here content analysis of various tweets indicates, similarly to previous study, that journalists do not use this platform for inquiring certain data, they use it mostly for building their personal brands. In addition, content is the most important focus of journalists and majority of it is not breaking news. Findings of this content analysis are beneficial for thesis research, because it highlights what kind of tweets are the most likely to be collaborative. It shows the type of content journalists are more likely to share and how this social media platform is being used by journalists and how that affects journalism itself. Analysis of differences between linking shows journalists being the most open when publishing external links on Twitter.

Journalists on Twitter do not provide strong opinions on issues, they rather give interpretations and analysis (Molyneux, 2015). This qualitative textual analysis of 430 journalists tweets during 2012 presidential campaign highlights that journalists regularly seek to assemble relationships with their audience to build their personal brands. In addition, research finds that choices of journalists on social media are more influenced by their personal ambitions, instead of by rules of media organizations. The research was performed based on gatekeeping and normative theories. This is another beneficial study, showing personal branding practices of journalists on Twitter, as it focuses on gatekeeping decisions through retweets. According to Molyneux (2015), the findings of the study could show how journalists act on Twitter in general.

Ottovordemgentschenfelde (2017) examined brand creation on Twitter by performing exploratory study on political journalists. This was done by using conceptual framework of personal branding. Ottovordemgentschenfelde (2017) study is of beneficial for thesis research, as it explores how journalists perform their branding activities on Twitter, more specifically about how journalists position their brand within the constraints of this platform. Though, study examines political journalists, it is easily applicable to environmental journalists as well, because branding practices of journalists are not affected by their specialization, especially when the focus is on the ways they deal with counter-hegemonic discourses of the platform. Another aspect of Ottovordemgentschenfelde (2017) study, that will be applied to thesis research is data on how environmental journalism on Twitter is affected by journalists' activities towards establishing their competitive superiority.

Olausson (2017) examined professional identity of journalists on Twitter by looking at it from discourse construction perspective. The aim of the study is to contribute to the knowledge on how professional identity of journalists are constructed on Twitter and this is accomplished
by analysing tweets of Swedish journalist. The theory used in this research is discourse theory and method used is qualitative discourse analysis. Research results indicate that discursive processes involving interlinked dialectical relationship with Twitter are a part of journalistic identity. Olausson (2017) findings are useful for thesis research, because it shows the influence of Twitter counter hegemonic discourse on journalists’ professional identity. Furthermore, it helps to identify those discourses and find how they compare to discourses of traditional media.

As mentioned in the introduction, it is imperative to study environmental communication on Twitter, due to previous research suggesting, that such microblogging website allows to establish the most connection and trust between journalists and their audiences (Gil De Zúñiga et al., 2016). To answer thesis second research question about audience trust on Twitter, it is important to first study the complexities of interactions of journalists on this platform. Gil De Zúñiga et al. (2016) findings provide the necessary information on how journalists conduct themselves there. The aim of Gil De Zúñiga et al. (2016) was to determine how journalists are being perceived on Twitter. Conducted two-wave online panel survey looks at things like audience engagement, editorial bias and expectations. Such factors are of high importance in finding out the advantages of this platform for communicating climate change, because they point to prevailing reporting routines on Twitter.

**Theoretical frame and concepts**

**Media Logic**

Media logic of news reporting is the main concept of this research, because it describes how climate change reporting is affected by media organizations and describes the existing logic within media organization. It is distinguished as existing rule set, emanating from different mediums and established formats, that filter content of news production (Altheide, 2013). Media logic attributes to the inferences and developments for creating reports that could be communicated through specific platform and it includes specific aspects like format of message (Altheide, 2004). In addition, media transforms content so that it could be applied to the logic. This is done so that news content would be digestible to their audience. Moreover, Altheide (2013) states, that media logic creates a filter of information translation to the public. Whereas, audiences apply this media logic influenced content to maintain their reality and this kind of information is constantly required for such maintenance. Furthermore, it is important to note, that media logic alters formats of messages based on
different mediums to help audience recognize the kind of content they require to maintain their reality (Altheide, 2013).

Media logic influences environmental reporting in many ways. For instance, media logic creates a lot of misconceptions for audiences about environment. Such confusion of public, like giving large amount of TV time to climate change deniers, comes from both internal and external influence on news organizations. Media logic is effected by this influence and it affects the way journalists approach reporting in general. Nevertheless, it differs among media companies, as some, for example, have their content significantly influenced by organizations that own them, which seek to reinforce their interests.

Connected to media logic is theory of hegemony, which refers to the media supporting dominant ideology (Thussu, 2006). Media is likely to support it, independently of it being private or not. Furthermore, hegemony theory highlights common ways of media being biased and it helps to determine the relationship between news organizations discourses and social media discourses. According to Altheide (1984), there are three premises that include the concept of media hegemony. Firstly, it is affected by journalists’ ideology, which in the case of the US would be western ideology, thus that would be reflected in their news reporting practises. Secondly, journalists are very likely to support the actions that come from this dominant ideology. Lastly, the reporting of opposing ideology is likely to be that of negative character. This research will be exploring the interaction between news organization’s hegemonic discourses and Twitter’s counter hegemonic discourses.

Environmental journalism, same as any kind of journalism, is affected by media logic. For this reason, content of tweets about climate change is analysed to determine to what extent the influence of media logic applies to environmental reporting on Twitter. This is important to research, because if media logic is less influential on Twitter for climate change reporting, it would mean that more accurate reporting could be performed on this platform. This research will aid in apprehending if Twitter is being used to its full advantage for environmental communication due to it not limiting journalists the way traditional media platforms do, where there is a higher influence of media logic. Media logic in this research is divided in two concepts related to what features are necessary for accurate climate change journalism. The reason for lack of credibility and participation comes from existing media logic.
The concept of credible climate change reporting is of high importance for this study, because there are many misconceptions about this global issue by the citizens. Those misrepresentations exist obviously due to media’s improper reporting. Thus, journalists need to appear credible to the public and when it comes to environmental journalists, they must report in a way that makes them appear more credible than reporter that misrepresent climate change. This is significantly easier to accomplish on social media (Gil De Zúñiga et al., 2016), therefore it is expected there to find credible environmental communication. Analysing journalists tweets about climate change will display if this assessment about reporting on Twitter is correct, as there is a possibility that social media platforms like Twitter do not contribute to more credible journalism. Research indicates large part of media credibility consisting of audience related variables, such as gender (Robinson & Kohut, 1988, as cited in Golan, 2010), race (Beaudoin & Thorson, 2005, as cited in Golan, 2010), age (Bucy, 2003, as cited in Golan, 201), education (Mulder, 1981, as cited in Golan, 2010) and income (Ibelema & Powell, 2001, as cited in Golan, 2010). However, these essential variables for credibility will not be considered in this research, as the analysis is performed on social media, where these variables are problematic to assess when it comes to journalists Twitter account followers. This research examines the way journalists write their messages on Twitter, do those messages include relevant features that make their climate change communication that of high credibility. The research looks for the following environmental reporting features: Description of climate change process, referencing scientific sources, unbalanced reporting, not confusing weather with climate and global reporting.

Participation

The main point of environmental communication is not for making people understand how climate is changing, but it is for making them act and participate in solving this problem, since government actions alone are not enough to tackle it. The fact that nowadays people know more about climate change than ever before, has not made a significant difference in their actions (Philips, Carvalho & Doyle, 2012). Therefore, the challenge for sustainable communication is not to make citizens as informed as possible, but rather to educate them on what specific actions they can take to contribute in reducing CO2 emissions.

In addition to inspecting whether environmental journalists on Twitter report in a way that makes the audience likely to trust them, this research inspects if journalists are trying to make their audience take certain action towards mitigating climate change. This inquiry will help to see whether environmental reporting on Twitter contributes to generating public participation. Based on the previous research in the area, 3 climate change communication
features that make people participate will be looked at. Those are: Engaging audience, giving instructions and reporting about how to adapt to climate change.

**Method (and material)**

The method of research is quantitative content analysis. Quantitative approach was chosen for this research, because this approach determines how media and audiences are connected (Jensen, 2012). Moreover, collection of quantitative date will allow for the hypothetical expectations to be either accepted or rejected (Jensen, 2012). In this case, the hypothesis is about environmental journalists taking advantage of social media features that challenge media logic of news reporting to produce quality messages about climate change that lead to public participating. Quantitative analysis allows to find out the nature of climate reporting on Twitter and to quantify the difference of reporting by different type of journalists. To answer raised research questions, it is imperative to possess numerical data, as the aim of the research requires knowing the precise difference in frequencies of distinct accurate reporting features.

**Material and selection**

Major US news organizations were chosen for this research, including newspapers, that have no less than 50,000 circulation. There is no specific reason for why this decision was made, because the media logic that is studied here does not depend on specific news organization. It is a common way news are produced. Freelance environmental journalists were selected randomly. Although, the prerequisite for them was to have no less than 1,500 followers on Twitter. Furthermore, study prioritized journalists that used to work at major media companies and those whose clients are major media companies. In addition, environmental journalists that tweet about climate change frequently were prioritized, meaning that journalists who do not report climate news in 10 consecutive tweets were not included.

Analysis is conducted based on predetermined categories, by looking at number of categories each tweet belongs to. 10 most recent tweets were analyzed of each of 7 US major news outlets environmental journalists and 10 most recent tweets of 7 freelance journalists. This approach helps in better comprehending the influence of counter hegemonic discourses on environmental journalism. Tweets are analyzed based on both their credibility and capability to induce audience participation. What comprises credibility and participation is determined
by previous research on proper climate change communication. This research could prove to be applicable for other social media platforms as well, as the main principles of sociality are likely to remain. Criteria for tweets are the following: tweet must include terms ‘climate change’ or ‘climate’ or ‘global warming’ or ‘greenhouse gas emissions’. In addition, it must not be a retweet, nor an opinion statement. Furthermore, tweets, that are solely pictures and videos, are not included in the research.

USA based environmental journalists were chosen, because it is a second country by the most amount of CO2 emissions (“Largest producers of CO2 emissions worldwide in 2016, based on their share of global CO2 emissions”, 2016). This makes the task of US environmental journalists to be of high significance for the global CO2 levels. Therefore, it is important that US citizens are as informed as possible about climate change. Furthermore, journalists, that work for the major US media companies are likely to be the most influential when it comes to climate change issue. Tweets will be analyzed not only by their content, but also what are they referencing to. In other words, analysis will not be limited by text included in tweets.

Content Analysis

Content analysis is an organized investigation of communication symbols, that based on calculation rules have been accredited mathematical values to make deductions about content from certain frame of reference and determine interplay of different values (Riffe, Lacy & Fico, 2014). Content of selected tweets is analyzed based on different categories, that indicate whether content was influenced by media logic of news reporting. Content analysis investigates influence of this logic on climate change reporting on Twitter. In other words, it investigates how counter-hegemonic discourses of Twitter (features of the platform that limit media logic’s influence) affect hegemonic discourses of news organizations.

Codebook

Tweets are put in 2 categories and 8 subcategories

Categories of reporting that represent credible climate change communication:

1) Tweets describing climate change as a process. Climate change is a process; therefore, it needs to be described as such. Process description is defined by connecting different events together as a part of one process that describes climate change. The whole
media logic is about describing occurrences (Olausson, 2011). This makes description of processes rather complicated. It is significantly important for the media to not rely on event focus reporting while covering climate change. Rather journalists should report it as a continuity with perspectives that cover long period of time. There is a substantial amount of research highlighting issue with event-dependent environmental reporting (Dunwoody & Griffin, 1993; Einsiedel & Coughland, 1993; Miller & Parnell Riechert, 2000; Singer & Endreny, 1993, as cited in Olausson, 2011). This research will look at whether environmental journalists on Twitter focus on portraying the process of global warming itself, or are they only writing about event related to climate change. For instance, tweet talking about government cutting environmental regulations will not be considered as process description.

2) Tweets referencing science. Climate change communication must be based on scientific information; therefore, tweets must in some way reference science, scientific articles or scientists. Media logic often does not address scientific studies and many referenced studies might not even be from legitimate sources. Science journalism is not only about explaining audience scientific findings, but it is also about providing people the broad perspective of what the science about described findings is all about and give them ideas of what are the consensus in scientific community (Rahmstorf, 2012). It is evident that current US journalism in this area is very lacking. According to McIlwaine (2013), the necessary quality of journalism for generating public engagement is reporting that comes from proper understanding of the science of climate change. This is another factor that media logic often goes against. The focus of news organizations is on quantity of information, on making their audience up to date with the most recent events. Such action is prioritized over quality reporting, which involves researching on background information of the news, which includes scientific findings.

3) Tweets containing unbalanced reporting. It is imperative to look at this, because balanced reporting about climate change is an inaccurate one and it is an inappropriate way to communicate it. In this research tweet is considered as balanced reporting if it includes word ‘sceptic’ or ‘denier’ when referencing a scientist. Media logic is effected by external influence on media company. For example, newspaper that are acquired by News Corp contain balanced reporting about environment due to company’s ties to big oil and coal corporations. The notion of fake debate about climate change among scientists is being pushed to the audience (McIlwaine, 2013).
4) Tweets not confusing weather with climate. Extreme weather events like droughts, floods, hot summers etc. are typically referred by media as caused by climate change and this creates confusion of the public, as they start thinking that these events are the only evidence for global warming (Hansen, 2010). Consequently, when, for instance, cold summer occurs, some people automatically start questioning the validity of global warming. Climate change communication should not align the same meaning to both weather and climate. There is an apparent descriptions of weather as climate in mainstream media by journalists not educated in the science of climate change (Olausson, 2009). Climate change reporting commonly occurs when there are extreme weather occasions, though, it is important that journalists report about this global issue even when there are no such occasions (Olausson, 2011).

5) Tweets reporting global news. The best climate change communication is the one that focuses on a global level, rather than describing it in relation to local events. Media logic also focuses on describing local events by using local perspective. For example, they would raise question like: How this affects our country? Rather than questions like: How this affects the world?

Categories of reporting qualities that induce audience participation in solving climate change:

6) Tweets addressing audience. Twitter allows the kind of participation from the audience, that is impossible to achieve in traditional media, where there is a prevalent one-way communication. This research investigates whether tweets include the word ‘you’, if there is a call to action and if journalist is asking audience a question. The typical journalism is a one-way communication, as the way traditional media works it is not possible for a journalist to have dialogical communication with the audience. Media logic is about reporting to large number of people about various most recent occurring events and not addressing them in a way of two-way communication or seeking response.

7) Tweets giving instructions. Tweets Providing instructions to public on how to tackle specific problems related to climate change is of high benefit to public's comprehension of the issue. This research examines whether environmental journalists are telling people what to do or referring to other sources that give this information. Media logic is not about engaging with people or telling people how they can contribute to solve issues, it is about describing occurrences.
8) Tweets including information on how to adapt to climate change. There are two sides to climate change problem and according to Olausson (2009), it must be tackled from both of mitigation and adaptation sides. Therefore, this research looks if information about how to adapt to climate change is apparent in environmental journalism on Twitter. Journalists on Twitter are not limited by simply covering mitigation related events. In contrast, media logic is not about giving solutions but rather describing events and invoking emotions from people. This kind of reporting, for example, can make people angry about some of the reported events, but not tell the public what they are ought to do.

Research process

Research started by searching for environmental journalists that are suitable for conducting this research. They were found in Twitter groups of environmental journalists and on the ‘following’ lists of other journalists. 14 journalists in total were selected. There were 20 tweets captured of each journalists’, that reference climate change. Of these 20 tweets, the ones that do not violate the rules of research were selected. The following task of the research was to examine how many features of correct climate change reporting each tweet contains. Gathered results were written in the codebook.

Quality of research

The codebook is suitable for this research, due to it containing the necessary variables to answer research questions. Both categories of trust and participation contain sufficient number of subcategories that help in examining every tweet from various points of view. Examined tweets based on these categories help in answering research questions. When research questions about trustworthiness and participation are answered, then the main question (RQ1) of this research, regarding the influence of media logic on climate change communication on Twitter, can be answered.

Reliability and validity

There are number of issues with this research. To begin with, there were 5 tweets that could have been interpreted differently. ‘Appendix’ contains the interpretative decisions I had to
make during the research. Those interpretative issues have no major implications for research results as they represent small number of examined tweets. If they were to be interpreted differently, research results would not change. Another issue is tweeting of journalists being distinct from each other. For example, one freelance journalist might be giving instructions in all his tweets, while majority of other would not be doing that. This indicates that the collection of results might have been not been the most efficient way. Considering percentage of each subcategory in each of the journalists might have led to more effective research. This does not affect research results, as it still indicates how each type of journalist is likely to report climate change on social media.

Findings and analysis

Table 1 – Describing process

‘Describing process’ category indicates how many of examined tweets of each type of journalists, described climate change as a process. ‘Yes’ refers to tweets that portray climate change as a process, while ‘No’ refers to tweets that portray it as an event. Tweets that describe events are misrepresenting climate change and are catering to existing media logic.

<table>
<thead>
<tr>
<th></th>
<th>Staff</th>
<th></th>
<th>Freelance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Describing process</td>
<td>8</td>
<td>62</td>
<td>28</td>
<td>42</td>
</tr>
</tbody>
</table>

Results indicate the most significant difference between staff and freelance journalists in climate change communication practises is in the category of ‘describing process’. Here it is evident that freelance journalists are more than 3 times likely to communicate climate change as a process. There are few possible reasons for why this is the case. As discussed previously, freelance journalists are not as restricted in construction of their tweets, thus they are not as affected by media logic in their reporting. There is more trust on Twitter, journalists seem more credible to their audience there (Gil De Zúñiga et al., 2016). According
to Hansen (2010), media logic is about describing events. Therefore, the main reason for such result is due to the influence of media logic. Another reason is that freelance journalists are more likely to write tweets from more variety of sources. Whereas, employed journalists more often link their tweets to articles from the news organization they are working for, because it would be unprofessional of them to promote articles from media companies that are competition. Nevertheless, both type of journalists proved previous research on media describing events, journalists not being aware of doing that. Either type of journalist is more likely to describe climate change as an event. All in all, this is an important finding showing that there is a lot of room for improvement in process description on Twitter. Nevertheless, it is safe to assume that process description is more prevalent on Twitter than on traditional media.

Berglez (2011) conducted study of Swedish journalists’ climate change communication practices show them identifying explanation of climate change as a process to be a complex task. There are implications related to business side of things, indicating that the audience are not likely to read scientific descriptions in news media. Process description could be affected by lack of creativity of journalists to either go outside or beyond media logic. Media logic involves advertising pressure, ownership, news cultures, limitations of time and space. However, these things do not restrict process description. Description of process is shown to be trustworthy climate change communication. There are traces of journalists trying to confront media logic. However, their personal branding ambitions appear to get in a way, as the focus goes on quantity of reporting. Journalists rely too much on explaining climate change through events. There is this assumption of reporting about such processes only when there are events related to them. Therefore, it is vital that journalists go outside or beyond of this logic and there are more opportunities of this kind of reporting on Twitter (Berglez, 2011).

To sum up, the main influence here is journalists being influenced by media logic and not being likely to report in different fashion. Moreover, there is influence of the media organization itself, as freelance journalists are less likely to only be focusing on event reporting. This could be due to staff journalists being told to focus on their news organization’s set agenda and link sources of it, articles. Important to note that this is not a case with every employed journalist, as some of them might be giving complete freedom with their professional Twitter accounts. Making the public aware of events occurring is necessary. However, to improve the quality of climate change reporting, there must be choice made to report only the most impactful events. Sometimes events cannot be related to process. Environmental journalists must prioritize climate change description content and relating
events to the process as often as possible. A sample of a tweet presenting climate change as an event:

Gringrich cutting a climate change ad with Nancy Pelosi in 2007 – and then later disavowing it – makes a bit more sense in this light (Plumer, 2017).

This tweet is relating climate change with a specific event and it makes it easy for audiences to misinterpret the issue.

Table 2 – Referencing science

‘Referencing science’ highlights tweets that include scientific sources, which is usually not the case in traditional media, as media logic is about simplifying information as much as possible. Quality environmental journalism is not possible without proper description of science reported issues (McIlwaine, 2013; Rahmstorf, 2012).

<table>
<thead>
<tr>
<th></th>
<th>Staff</th>
<th></th>
<th>Freelance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Referencing science</td>
<td>9</td>
<td>61</td>
<td>24</td>
<td>46</td>
</tr>
</tbody>
</table>

The table shows freelance journalists to be almost three times more likely to reference science on Twitter than staff journalists. However, in both cases there are still more tweets not referencing science, than those that reference science. An example of tweet referencing science:

Climate Change-Fueled Jet Stream Linked to Brutal Floods and Heatwaves, Says Study (La Monica, 2017).

This tweet links to the article that dwells more detailly into the study. This kind of journalism is very important, as it educates the public.

There are few possible reasons for such findings. Firstly, media logic ignores sources, providing enough proof to public of legitimacy of their reports and this damages environmental journalists’ credibility. Berglez (2011) states that climate change reporting that includes a required amount of science must at least go outside of the media logic. The
table indicates that journalists are more likely to not challenge this logic. Environmental journalists, who are not influenced by external entity, can provide better quality climate change reporting. Such results to an extent reinforce ideas of McIlwaine (2013) analysis, as it shows specialist journalists to be aware of climate change science. However, research found environmental journalists to be more likely to not reference science, even though they have the knowledge of it. This points to reporter not full comprehending the importance of referencing science as oppose to them not having knowledge of it. Thus, the findings of this research are in accord with McIlwaine (2013) analysis. Another reason for such result is that media logic is about reporting in a way that is common in journalistic practice, rather than mixing it with scientific writing. The media are likely to want to keep scientific information to a minimum, due to many people not being educated in science and due to nature of journalistic articles, which are typically limited in size.

Table 3 – Unbalanced reporting

‘Unbalanced reporting’ refers to tweets that portray climate change as a consensus in science, rather than something that is debatable in scientific community. Media logic in the US is commonly about providing balanced reporting, which means showing opposing views. This kind of reporting is detrimental when it comes to climate change, as it misrepresents this shift in global average temperatures. It leads to audience having misconceptions about climate change. Skeptics that give their views in news media are usually the ones who are paid by big oil and coil corporations.

<table>
<thead>
<tr>
<th></th>
<th>Staff</th>
<th></th>
<th>Freelance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Unbalanced reporting</td>
<td>68</td>
<td>2</td>
<td>70</td>
<td>0</td>
</tr>
</tbody>
</table>

All the tweets of the examined tweets of freelance journalists contain unbalanced reporting, while there are two tweets of staff journalists that provide balanced reporting. This difference is very insignificant and leads to conclude that there is no issue in this case, as these are
environmental journalists, meaning they understand the difference in this reporting. A sample tweet of balanced reporting:

\[\text{Meet the "Nerd for Science" running against the biggest climate denier in Congress – by @alexkaufman, @c_m_dangelo (Sheppard, 2017).}\]

This is balanced reporting, because the assumption could be given that is not a scientific consensus. Journalism should not include opinions of deniers, especially when it comes to tweets, as they are short messages.

Such results are likely, because this research analyzed journalists that specialize in environment, thus they are aware of dangers of referencing climate sceptics. It is important to point out that two tweets of ‘balanced reporting’ could be accidental and do not necessary mean, that they come from lack of knowledge in the issue of balanced climate change reporting. In other words, those tweets might have not been meant to appear as they did. Similarly, tweets do not confuse climate with weather. This is very likely due to those tweets being written by specialist journalists. Therefore, we can assume that this problem is only common with journalists that either are not aware of that or those that are related in some way with big oil and coil corporations. Reporting both sides, giving equal attention, makes the public completely misunderstand the problem of climate. It leads to people questioning scientists’ reports, relating climate with weather, making inaccurate assumptions.

General reporters are highly unlikely to understand science and not likely to learn, because science takes a fraction of media time (McIlwaine, 2013). Therefore, results of this research show environmental journalists, unlike general journalists, to be aware of science and dangers of balanced reporting for public comprehension. Balanced reporting ignores scientific facts mostly due to journalistic practice of providing opposing views (McIlwaine, 2013). Generally, journalists do not pay attention to the fact of scientific consensus of climate science. The table, show this to not be the case with journalists that specialize in environment. It is evident that they are very aware of what is established in scientific community.

\textbf{Table 4 – Tweets not confusing weather}

‘Tweets not confusing weather’ indicates number of tweets that differentiate climate from weather. It is a common in news media to relate weather events with climate change. Reporting in a way that makes audience view weather and climate as the same thing is scientifically incorrect.
All the analyzed tweets are not confusing weather with climate change. Such findings are likely due to analyzed tweets being those of specialist journalists. It is important that news about climate change are not only reported when the cases of extreme weather appear, because it creates public assumption that climate and weather is the same thing (Olausson, 2011). As a result, confusion about climate change becomes even more augmented. This kind of confusion would make people more likely to misunderstand climate change. However, from the conducted study it appears that this not the case either due to the platform where reports are made or due to awareness of specialist journalists. Climate change is not measured by those kind of weather events, it is calculated by examining change in average global temperature and what these changes cause and what is their cause.

Table 5 – Global reporting

‘Global reporting’ highlights number of tweets that report about climate change from a global perspective. This reporting is necessary for proper comprehension of this issue, as it affects all parts of the world. In contrast, media logic is about reporting from a local perspective. When it comes to changes of global temperature, this approach to reporting is shortsighted.
Research of tweets including global reporting indicates, there to be almost double the amount of global reporting of climate change in tweets written by freelance journalists. Such results lead to assumption of possible reason, that since the staff journalists are employed by news organization, whose profit comes from citizens, they are more interested in local coverage, than a global one.

The most important aspect of global reporting is that it is a perspective of explaining events from global outlook and how this affects domestic environment (Berglez, 2008). Another important aspect is high possibility that global power affects majority of the reported issues in the news. It is of high significance that the involvement of global power is included in the same foundation of news, as almost every issue in some way is connected to global power (Berglez, 2013). Therefore, inclusion of relating events to global powers is a more accurate reporting. When it comes to climate change, it is known that major corporations are interested in battling against environmental regulations. Hence, they are interested in making people unaware of this issue.

Unlike global reporting, local reporting is not able to make connections between occurrences of the world and it looks at these occurrences from national outlook, not viewing the world as single entity (Berglez, 2008). Climate change is a global process, that is the reason why journalists must restrain from reporting local news about environment as much as possible. An example of tweet reporting climate change from a global perspective:

_Incredible photos of Qaanaaq, Greenland by @whitneyshefte in our latest story about the toll of climate change (Mooney, 2017)._  

Research results indicate this to be a problem with majority of tweets explaining local events like government cutting environmental regulations. Such news is obviously important; however, they must also contain information of what these local events mean for the planet and the process of climate change itself. It is very likely, that majority of the audience are not able to make these connections themselves.

Another side of the problem are news disconnecting global and local, by portraying climate change mitigation as only to be a global problem for international politics to deal with (Olausson, 2009). What this kind of portrayal of the issue does is disconnects individual from feeling responsible for dealing with this problem (Olausson, 2011). However, recent research (Brüggemann & Engesserb, 2017) shows that climate change communication is changing with regards to balanced reporting. USA media is starting to report in a way that evaluates
and contextualizes views of deniers, rather than just giving them coverage for the reason, that they have an opposing opinion (Brüggemanna & Engesserb, 2017).

Table 6 – Addressing audience

‘Addressing audience’ shows how many of examined tweets address audience. This opposes media logic, as it is uncommon to see journalists addressing audience in traditional media. This makes audience more likely to participate and take actions that better protect environment.

<table>
<thead>
<tr>
<th></th>
<th>Staff</th>
<th></th>
<th>Freelance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Addressing</td>
<td>2</td>
<td>68</td>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td>audience</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results of the research of tweets that address audience show that there is no difference between two groups of journalists in their frequency of writing tweets that address their audience. Both employed and freelance environmental journalists wrote 2 audience addressing tweets. An example of tweet addressing audience by inquiring audience participation:

_What can @POTUS do on climate policy? And what would you do instead? Find out in this #fun quiz I made! (Schlossberg, 2017)._ 

These findings indicate that journalists are not utilizing Twitter to its full advantage for quality climate change communication. They do not appear to be focusing on making their followers take actions related to content of tweets, for example, action of protecting environment. Additionally, this table leads to new information regarding media logic’s influence, because findings being the same for staff and freelance journalists means that this aspect of journalistic activity is not affected by media logic. More specifically the kind of logic that comes from news organizations, the one that makes organization’s journalists report in a certain way. Thus, media logic as a reason for lack of audience engagement could be ruled out. Other possible reason for such reporting feature could be journalists approaching social media more like traditional media where there is no two-way interaction with the audience.
Table 7 – Giving instructions

‘Giving instructions’ indicates how many of analyzed tweets include instruction to the audience on how they can contribute in mitigating CO2 emissions. Such reporting leads to people being more aware about what causes climate change. This is crucial part of climate change communication.

<table>
<thead>
<tr>
<th></th>
<th>Staff</th>
<th></th>
<th>Freelance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Giving instructions</td>
<td>0</td>
<td>70</td>
<td>5</td>
<td>65</td>
</tr>
</tbody>
</table>

The results, of analysis of tweets regarding their frequency of providing instruction to audience on how they can contribute in mitigating their carbon footprint or in other type of action that could help with cutting CO2 emissions, indicate environmental journalists are not keen on reporting in such way with only 5 tweets of freelance journalists. An example of tweet giving instructions:

_The Times talks about leadership in climate journalism. The only thing that shows leadership-in 2017-is real commitment to reporting reality (Steffen, 2017)._  

This tweet gives instruction about importance of getting news from sources that provide accurate information. Insignificant difference between staff and freelance journalists in this table could either mean strong influence of media logic in this regard or lack of influence from Twitter counter-hegemonic discourses, not making environmental journalists realize of advantages of possibility of instruction giving reporting. Possible reason for such results could be because journalists might assume that the audience is not interested in getting instruction, since they focus significantly on building their brands on Twitter (Vivo, 2013; Molyneux, 2015; Ottovordemgentschenfelde, 2017). Nevertheless, it is not entirely clear whether giving instructions would damage their brands.

Giving instructions would mean approaching reporting as two-way communication. Philips et al. (2012) states that such communication requires considering differentiating needs of audience members. Furthermore, Philips et al. (2012) affirms that in a one-way communication there is a process that goes from different directions, instead of scientists
being a sender and journalists translating this message to passive recipient. Thus, it is safe to state that journalists’ communication on Twitter is highly influenced by their followers. Thus, basing on Philips et al. (2012) book, we can describe environmental communication on Twitter in the following way: the media logic influences the way journalists report and they influence their audience, and it in turn influences them. These 3 components influence each other, except here the Twitter itself influences journalists and audience, while not influencing media logic directly. Additionally, it is important to point out here a study indicating that people are likely to act on climate change when communication is about general resource use, as this more relatable to the public (Fischer, 2012). In that case, research about journalists’ communication on Twitter about resource use could prove to be beneficial in inspecting the instruction giving aspect of environmental reporting. Nonetheless, there is a case could be made for media logic’s influence on instruction giving, as there were 5 cases where freelance journalists gave instruction to their audience.

Table 8 – Adaptation

‘Adaptation’ indicates number of tweets that include information on how we should adapt to changing climate. Media logic makes it complicated to give solutions to a problem. This is particularly prevalent with making connection between both solutions of CO2 mitigation and adaptation to climate change. Notably, public participation can be enhanced if information about adaptation is delivered, as this would raise awareness in what action can be taken. In comparison, the public are not as involved if they are only given news about occurrences related to global warming.

<table>
<thead>
<tr>
<th></th>
<th>Staff</th>
<th>Freelance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Adaptation</td>
<td>0</td>
<td>70</td>
</tr>
</tbody>
</table>

None of tweets of both type of journalists include adaptation discourse. This is a significant revelation, because it highlights a bigger problem with the way media logic influences journalists reporting decisions. Two climate change frames of mitigation and adaptation usually do not exist within the same context of news (Olausson, 2009). Separation of these frames indicates media limit reporting of full context of global disasters, with mostly focusing
on providing one side of the problem, that is how to reduce CO₂ emissions. Public awareness of climate change is about citizens being able to make connection between distinct elements that compile it, meaning both frames are necessary in a climate change news report. A study of larger sample, may find tweets containing frame of adaptation. This would allow to see how adaptation is framed and how it is connected to mitigation. Based on what is seen in previous tables, it could be speculated that environmental journalists would be more likely to create a connection between these two frames. In addition, inclusion of adaptation does not dependent on media organization, as this table highlights no difference between staff and freelance journalists.

RQ 2 - Do environmental journalists on Twitter communicate climate change in a way that makes audience more likely to trust them?

Examining results of tweets belonging to category of media trust indicate that there is a substantial influence of media logic on environmental journalism, because results show freelance journalists to be more trustworthy on Twitter than staff journalists. Thus, the study (Gil De Zúñiga et al., 2016) finding Twitter platform contributing to a more credible reporting is correct. For this reason, it is important that environmental journalists challenge media logic. Because climate change issue is outside of the logic and it is impossible to fully explain it inside media logic (Berglez, 2011). This is especially evident with process description and referencing science. Environmental journalists should use flexibility of the platform allowing possibilities to report outside media logic or even change it fundamentally.

One of the major problems of media logic comes from media hegemony (Altheide, 1984). Examined journalists published tweets shows them having majority of the content about fighting opposing ideology, which in this case is a current US government administration. Substantial number of tweets are news regarding government supporting oil and coil corporations, cutting environmental regulations, showing desire to retreat from global environmental agreements. Namely the following:

*So no mention of #climate change by Rex Tillerson in his opening statement.*

*Questions now...* (Yeo, 2017).

Admittedly, such information is valuable to the public, though, when it makes up majority of the content, it affects the quality of what environmental journalists are supposed to accomplish. Importantly, hegemony impacts freelance journalists too, since they give the
impression of being compelled to oppose ideology they disagree with. Still they are not as likely to oppose lack of public comprehension about climate change.

Another part of media logic that influences credibility is agenda-setting, which means that journalists establish pre-existing agenda (McCombs & Shaw, 1972). Thus, audience views climate change in a way of set agenda by journalist. Nevertheless, people are not passive recipients, they can assess information critically, so this agenda is not significantly different from theirs. Citizens can critically think about media reporting and understand how misrepresented events often are (Olausson, 2011). This has a lot to do with the fact that citizens are very active in constructing media logic, the same as other actors, like in this instance, scientists and news organization (Plesner, 2010). In addition, media logic affects what frames journalists use in their news reports (Berglez, 2011). The common way climate change is framed does not typically involve providing global perspective or not providing views of science deniers. Despite the impact of media logic on reporting, personal branding interests of journalists also damage their ability to report climate change in a trustworthy manner (Vivo, 2013; Molyneux, 2015; Ottovordemgentschenfelde, 2017). This is because of them putting their branding activities in front of quality reporting. Furthermore, regarding branding, employed journalists are more likely to advertise news sources coming from news organizations they work at (Russel, et al., 2015). There are few reasons why personal branding interests are being prioritized over credible climate change reporting. Firstly, media logic affects how they adapt to the platform. Study about social media adoption shows journalists approaching new platform as ways to increase their popularity (Gulyas, 2016). Another reason, is their journalistic identity affecting their desire for branding (Olausson, 2017). This is due to them not seeing the importance of positive impact on society, that could be brought if it is used as an education platform. This identity comes from the way Twitter platform works, which is about communicating in short messages. Identity is not transformed by journalist’s branding practices, that became possible with social media, instead both branding and identity blend together (Berglez, 2011). Journalists approach to Twitter as a personal branding platform is a counter-hegemony that negatively affects the quality of climate change reporting. Despite that, there are more features of this platform creating counter-hegemony that rises overall credibility of environmental journalism. Based on this and previous research, desire for personal branding appears to be the only characteristic of Twitter that negatively impacts climate change communication.

To sum up, it is imperative that journalists are being trusted by their audience, because that would make people be more aware of the reported issues and help in participation aspect. In general, freelance journalists are more trustworthy on Twitter than staff journalists. To
improve credibility, journalists must (1) go challenge or transform media logic and (2) prioritize quality reporting over branding.

RQ 3 - Do environmental journalists report climate change in a way that makes the audience more likely to participate in tackling on Twitter reported issues such as climate change?

By collecting number of tweets that increase likeness of public participation in climate change, it is apparent that environmental journalists are not utilizing Twitter to its advantages over traditional media. If used properly, Twitter can be used to engage in discussions with audiences that could lead to them comprehending on what daily activities could result in mitigation of greenhouse gas emissions. Since results do not show a substantial difference in employed and freelance journalists tweets in the case of participation categories, it means that media logic’s influence on participation inducing reporting is minimum. Therefore, it is essential to look at other possible reasons for lack of those type of tweets. Previous research (Olausson, 2011) highlights three features of reporting that limit citizen participation in climate change. Firstly, reporting that seeks to evoke feelings is pertaining from receiving logical reaction and from providing relevant scientific information. Secondly, reporting oriented in financial gain results in discourses that are rather profitable than useful to society. Another feature limiting citizen participation is reporting without connecting and integrating different events. Often journalists report events without giving proper context that connect other relevant events. In the case of climate change, one report could be about heatwaves, another about deforestation without connecting them or providing information on how this relates to everyday life.

Other research state biggest obstacle for necessary participation to be confusion of the public that comes from arguing politicians and scientists (McIlwaine, 2013). People seeing those types of debates frequently would find it complicated to accept that there is a scientific consensus about climate change. There is a substantial amount of information in Philips et al. (2012) book that specifically deal with media’s relationship with participation. To begin with, there is a lack of emphasis in media on educating people about how they should act, as existing education did not see any noticeable increase in citizen participation (Philips et al., 2012). This is due to education not containing information on what changes in social life must occur. Thus, environmental reporting must be focused on providing information about daily choices citizens are ought to make. For instance, telling people how consuming less meat could result in fewer CO2 emissions. Another significant point is that scientists are not looking at reasons for why citizens are not trusting them provided scientific evidence (Philips
et al., 2012). If scientists where to analyze this, then they could present facts in a way that could result in lower number of climate change deniers. Difficulty of addressing CO2 mitigation issue also comes from entrenched institutional procedures that must be re-settled by different social actors (Philips et al., 2012). There could be seen a common public assumption that the necessary participation could not be achieved and the real solutions lie in government making policies that cut greenhouse gas emissions (Fischer et al., 2012). Communication should focus on the resource use, where most people already agree about the fact that their current use is unsustainable. Such communication would likely get more participation regarding climate change, than if it were focusing on climate change science (Fischer et al., 2012).

As previously mentioned, personal branding impact journalists’ likeness to appear credible on Twitter. This is also the case with participation, because performing activities like giving instructions or talking about adaptation, have potential to damage their brands. There are personal branding features to consider from previous research while analyzing public participation. The study (Vivo, 2013) shows, that journalists prioritize publishing information on Twitter that helps their brand over the one that is beneficial for society. “The content of these tweets appears to be driven more by a desire to form relationships with their audience than by journalists’ work in information gathering” (Molyneux, 2015, p.932). This further indicates preferences of journalists when it comes to social media. Forming relationship, that do not lead to journalists educating the audience, is detrimental to citizens having desire to participate and taking necessary action. Another relevant point to consider are brand identities of journalists being hybrid and constituting of organizational identity, professional identity and personal identity (Ottovordemgentschenfelde, 2017). The difference with freelance journalists is that they do not have an organizational identity, meaning they do not have status and cultural authority that comes from being linked with news organization. Not having this identity, might impact journalist approach to public participation. This could be related to freelance journalists publishing 5 more tweets giving instructions than journalists associated to news organizations.

Taking research results and analysis into account, environmental journalists are not reporting climate change on Twitter in a way that promotes participation from their audience. For this to change, journalists must prioritize educating and integrating citizens in the issue over building their personal brands.
RQ 1 - How climate change communication on Twitter is influenced by media logic of news reporting?

Considering, previous research questions indicating, that environmental journalists are providing more trustworthy climate change and not more participation inducing reporting on Twitter, it becomes clear how media logic influences climate change reporting on Twitter. Media logic of news reporting is used in this research to measure what changes occur when influence of this logic is minimized for journalists and this research proves that media logic does in fact influence how journalists report about climate change, more specifically how they are able provide credible climate change reporting. It directly relates with media hegemony, coming from dominant ideology of news organizations, whom alter information to match hegemonic discourses, which in the case of the topic of this research, are that of features of poor quality climate change reporting are that of dominant ideology of news organizations. Communication on Twitter represents counter hegemonic discourses, which influence both journalist of news organization and freelance journalists. By applying Berglez (2011) findings, it was established in this thesis that media logic must be approached from either outside perspective or from replacing perspective to provide quality climate change reporting. It is very likely that if such approach to media logic were to be utilized, journalists would be able to report in a way that makes audience more likely to get involved in solving the issue. The way public perceive climate change issue is directly related to established media logic of news reporting, thus, it must be transformed for the audience to be able to have the necessary comprehension of the issue that leads to the right actions being taken to better mitigate emissions. Furthermore, both credibility and public participation could benefit substantially if journalists were to prioritize educating people on science over building their brands.

The research conducted in this thesis confirmed that climate change is not being properly communicated on Twitter, as large number of tweets did not provide the most accurate journalism. Despite the influence of media logic, climate change is not being properly communicated on Twitter also due to the missing connection between citizens being informed about issue and acting towards solving it (Philips et al., 2012). For this reason, providing people news should not be the main objective for sustainable communication, but rather raising awareness of precise steps citizens can take to contribute in mitigating greenhouse gas emissions. Undoubtedly, the challenge here is in emphasizing on possible individual actions, contrary to talking about issue related events. Thus, journalists must seek to provide this relevant information. Although it is difficult to achieve accurate climate change journalism due to existing hegemonic discourses coming from news organizations, Twitter helps journalists in raising public participation. This research shows journalists to not be utilizing this opportunity on Twitter and it is due to obstacles like influence of social
representations, media logic and personal branding. People are more likely to trust journalists on Twitter (Gil De Zúñiga et al., 2016), but, as research results indicate, they are not more likely to become more engaged in participating in solving the issue. It is important to point out that Twitter platform is still a new tool in journalism and it is likely to take time for journalists to fully understand how it could be utilized for better quality reporting.

Important point to consider in this study are social representations that also influence journalism in general, as citizens create social representations about climate change (Jaspal, et al., 2014). They affect the media logic itself, thus, they indirectly influence climate change journalism. For this reason, they affect implication for research results, regarding media logic’s impact on global warming reporting on Twitter. Those representations do not highlight consensus, due to them being distinct. Study (Jaspal, et al., 2014) shows different social representations existing since climate change issue was in the public eye and affecting the way discussions about this problem are assembled in contemporary society. Undoubtedly, research results are impacted by social structures, because journalists are likely communicating in a specific way due to existing social representations in society. It can be assumed that if freelance journalists are communicating one way, they act as reinforcers of existing social reality like any other member of society. Research shows freelance journalists not differing from employed journalists when it comes to ‘addressing audience’ and ‘adaptation’. This indicates possible influence of social representations on discourse of adaptation not being a part of social reality. Admittedly, engagement could not be related to social representations, it could most likely be related to branding issue, as audience might not be used to this kind of reporting. Media discourses, that challenge common social representations, are likely to be rejected by the public (Olausson, 2011). This either means that media will change those discourses or that they will be adopted by the audience over time. However, in that case it is probable that the adopted ones are not substantially different than already established social representations.
Conclusion

This thesis has explored how environmental journalists communicate climate change on Twitter. It finds the effect of Twitter's counter hegemonic discourses do counter discourses of media, allowing for a more accurate climate change reporting in general. Credible global warming reporting is prevalent on Twitter, whereas participation promoting journalism to be almost unnoticeable, even though previously mentioned research shows this is very much possible to accomplish on Twitter. In addition, freelance journalists are providing more credible climate change journalism than staff journalists. The difficulty in tackling climate change comes from lack of public understanding of this issue, which to large extent stems from the information they are given by the media. Misrepresentation of this problem has direct influence on how the public react.

Contributions of the study

This research contributes to the field of sustainable communication studies. More specifically, it advances existing research in climate change journalism and research about journalism on Twitter. Additionally, it addresses a gap in research about media logic's influence on climate change reporting on Twitter, where counter-hegemonic discourses allow transformations to occur in reporting itself. Research results could prove to be beneficial in better understanding of the most effective ways in communicating climate change on Twitter. Furthermore, results highlight the challenges that must be dealt with to generate necessary public participation. For instance, solving issue of personal branding prioritization would essentially advance environmental journalism.

Limitations of the research

The research is limited by not having considered other types of journalists’ activities on Twitter. For instance, it did not look at retweets without additional content from journalists. Admittedly, journalists Twitter profile followers are drawn to all kinds of published content. The reason this research did not considered retweets without input of examined journalist, is because there are many complexities involved in their assessment, like assessing whether intention of retweeting was based on climate related issue. Another thing that research did not consider, is tweets that do not include word ‘climate’. As discussed in the analysis, discourses involving resource use could prove to be of high benefit in citizens becoming more
participative in the issue of climate change, as this is more of public consensus. People are more likely to agree that resources are being used inefficiently than about whether there is a global problem of climate getting warmer. In this case, lifestyle changes they ought to make would appear too drastic. Therefore, reporting about how to make resource usage more sustainable, how could people contribute to this, would make them more likely to make this contribution. Indeed, certain actions that make resource use more sustainable, could also contribute to mitigation greenhouse gas emissions. For this reason, tweets that have this kind of content could be inducing public participation in solving environmental issues. If these kinds of reporting activities on Twitter are common, then this research assessment of results about journalist not achieving necessary public participation in climate change could prove to be incorrect.

Suggestions for future research

Future research is necessary that could address climate change communication on social media and how representations of environment differ on social media from representations on traditional media. Given the fact, that social media allows different type of communication, which is less formal and more personal, the representations should induce a more participative citizen perception of climate change. Another research could be a similar study about discussed limitation of this research of not inspecting tweets about related issues to climate change like inefficient resource use. Overall, participation is of high importance in dealing with any global problem and journalists play a significant part in that. Therefore, studies that could investigate citizen participation even more thoroughly are in need with new communication technologies bringing unique possibilities in journalism. Implementation of credible reporting is undoubtedly important, nonetheless, this research highlight this aspect of journalism being more developed than the one that makes public participate.
References


Mooney, C. [chriscmooney]. (2017, April 29). Incredible photos of Qaanaaq, Greenland by @whitneyshefte in our latest story about the toll of climate change [Tweet]. Retrieved from https://twitter.com/chriscmooney/status/858363851104038912


Sheppard, K. [kate_sheppard]. (2017, April 29). Meet the “Nerd for Science” running against the biggest climate denier in Congress – by @alexkaufman, @c_m_dangelo [Tweet]. Retrieved from https://twitter.com/kate_sheppard/status/858372471183036417


Steffen, A. [AlexSteffen]. (2017, April 29). The Times talks about leadership in climate journalism. The only thing that shows leadership in 2017 is real commitment to reporting reality [Tweet]. Retrieved from https://twitter.com/AlexSteffen/status/858403391516491776


Appendix – Interpretative issues

This part of project presents tweets that could be interpreted differently than the values chosen for them during research.

This tweet could be easily misrepresented by the audience as if there were no consensus in scientific community about climate change. It is written in a way that could be viewed as talking about disagreement between scientists about climate science. However, this tweet might be also seen as not balanced reporting if it was to be viewed from point of view of journalists showing that Bill Nye is not an authority in this matter. This tweet was considered as providing balanced reporting due to it leaving a lot of space for interpretations for there being large number of environmental scientists disagreeing with climate change. It is obvious, that journalist did not mean that, however, audience lacking knowledge in environmental science are likely to misinterpret it.

There is an interpretative problem with this tweet whether it is referencing science. On one hand, this tweet could be considered as talking about scientists’ findings about global temperature. On the other hand, this could be viewed as reference to House Science not using correct sources. This tweet was considered as referencing science, because it refers to ‘actual scientists’ as the correct source.
This tweet is not referencing science. However, this is a tweet originally replying to tweet that references scientific data. Thus, this is viewed as continuation of that one tweet.

This is the original tweet that is referenced. The scientific sources are referenced in the linked blog post of this tweet. On the other hand, looking from the audience perspective tweets might not be viewed as continuation of other ones, creating perception that science is not being referenced. Such issue was not considered when establishing rules for this research.
It is not entirely clear if this tweet is more accurately understood as describing event about study or as a climate change process that creates extreme weather. The tweet was considered as describing climate change as a process, because linked article clearly describes climate change as a process.