



# Media Consumption Patterns and Climate Change Concern in Belgium

A Quantitative Analysis of the Impact of Relative Non-Traditional and Traditional Media Consumption, with an Exploration of Education and Age as Moderators

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## Abstract

Previous research has established a link between media consumption and concern for climate change. Given the recent proliferation of media and changes in media use, it is crucial to consider the consequences of today's widespread use of non-traditional media. This thesis theorises that characteristics of non-traditional media such as weaker editorial oversight negatively affect concern for climate change, while traditional media might mitigate this effect. Thus, this study examines the association between relying more strongly on non-traditional over traditional media and lower concern for climate change. Additionally, it is hypothesised that this association is moderated by age and education, being weaker for younger and higher-educated individuals. An OLS multiple linear regression model was applied to test this association and the moderating effects of age and education using existing quantitative data from ESS round 10 and CRONOS-2 Wave 6 (n= 545). The results show no evidence to support the hypotheses. Consequently, based on this analysis, it is concluded that there is no association between 'relative reliance on non-traditional over traditional media' and concern for climate change in the Belgian context. Furthermore, this association is not moderated by age or education. The implications of these findings on the literature and avenues future research are discussed in the conclusion.

*Keywords: age, climate change concern, education, media consumption, quantitative survey data*

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## Introduction

In the digital age, often referred to as the information age, there has been exponential growth in access to information and news. Individuals constantly have access to unlimited volumes of information through newspapers, radio, TV, computers, smartphones, social media and the internet. The traditional news mass media, i.e. newspapers, radio and television (and their online outlets), are substituted or complemented by non-traditional online media sources (Babutsidze, Blankenberg, & Chai, 2023). The proliferation of media has changed the information consumption habits as individuals start to use more non-traditional media sources. Therefore, it is imperative to comprehend how traditional and non-traditional media use influences individual's political attitudes, especially about prominent societal challenges such as climate change.

Climate change is a major topic in our society and political landscape, emerging as one of the top priorities on the global policy agenda (Bernauer, 2013). The United Nations recognises it as *“one of the major challenges of our time”* (United Nations, 2024). Despite widespread acknowledgement of its significance, opinions about climate change continue to be polarised. Many individuals remain sceptical about the general existence of climate change and whether it is human-caused or considered a global emergency (Ballew et al., 2019). To study these opinions, the United Nations Development Programme (UNDP) and the University of Oxford conducted a global opinion study about climate change covering over 50 countries (Flynn et al., 2021).

The survey questioned whether individuals consider climate change a global emergency and their opinions about the 18 key climate policies. The findings revealed that 64% of respondents considered climate change a global emergency, which they believe to be enough to require global action (Flynn et al., 2021). At the same time this means that 36% indicate that they do not believe climate change is a global emergency. The study also found significant attitude distinctions for different levels of education and ages. Specifically, it was found that highly educated individuals and younger people are much more concerned about climate change (Flynn, et al., 2021).

Taking these findings into account, this research aims to explore how the use of non-traditional and traditional media is associated with concern for climate change. Agenda-setting and framing theory suggest an association between media use and how political attitudes are formed. These theories highlight the media's important role in identifying salient issues and how individuals' attitudes are formed about these issues based on how they are framed in the media (Hoewe & Peacock, 2020). Therefore, this study considers how relying more strongly on non-traditional than traditional media might be associated with different levels of concern for climate change. Based on the distinctions in concern for climate change found for age and education reported in the global opinion study by UNDP and the University of Oxford, this research also considers the moderating effect of both age and education level on the association.

Specifically, this study examines the following research question: ***What is the association between relying more strongly on non-traditional than traditional media and concern for climate change, and how does the relationship vary across different ages and education groups?***

Many scholars have already investigated the media's role in explaining varying political attitudes regarding climate change (Falkenberg et al., 2020; Pandey, 2023). Therefore, the study's primary objective is to further develop and refine the existing research by focusing specifically on exploring the relationship between relying more strongly on non-traditional than traditional media and concern for climate change. The study also explores the moderating effect of both the education level and age to further investigate the underlying dynamics of the relationship.

As such, the study addresses a current societal concern, i.e. information polarization due to non-traditional media use and its impact on forming political attitudes regarding a pressing issue such as climate change (Wilson, Parker, & Feinberg, 2020). Understanding how non-traditional and traditional media use might affect individuals' political attitudes could offer valuable insights for policymakers, educators and media users. This study aims to provide a more comprehensive understanding of the complex interplay between media use, age, education, and climate change attitudes.

In order to maintain research feasibility, the study will concentrate on Belgium, examining the relationship between stronger reliance on non-traditional than traditional media and Belgians' concern for climate change. Belgium has been selected for several reasons. First, Belgium is an interesting case due to its high internet access level, with 94.48% of households connected (Eurostat, 2024). The widespread internet access supports the assumption that many Belgian individuals are able to use non-traditional media. Secondly, the country ranks lowest in Europe in terms of the population's satisfaction with the government's climate change actions. Only 22% of the Belgian population view the government's actions as adequate (Hughes, 2023). This dissatisfaction underscores the continued public interest and concern for climate change. Additionally, the European Social Survey (ESS) provides relevant data about the Belgian context that fits the research question. Lastly, conducting this research for the Belgian context is out of personal interest as it is my home country.

## Theoretical framework

### Consumption of non-traditional and traditional media and climate change concern

*Media consumption* is defined as the sum of information and/or entertainment media taken in by an individual (John, 2021). In recent decades, these media consumption habits have substantially transformed due to the proliferation of media (Babutsidze et al., 2023). However, despite the expansion, television remains the most used news source for EU citizens, with 71% choosing it as their primary news source (European Parliament, 2023). Following television, online press and/or news platforms are mentioned by 42%, and radio and social media platforms each by 37%. Mentions of social media platforms increased by 11-percentage points in the last year alone (European Parliament, 2023). Considering this substantial shift, the association between relying more strongly on non-traditional than traditional media and concern for climate change will be explored further in this theoretical framework. In this thesis, traditional media encompasses radio, television and newspapers, including both print and online versions, whereas non-traditional media comprises social media platforms, blogs, discussion forums and any other online sources.

Research considers that the relationship between media use and political attitudes can be understood through a dual focus on the media content and the user's selection and perception of that content (Hoewe & Peacock, 2020). The agenda-setting theory explains that the public perception of an issue's saliency is directly linked to its media coverage (Hoewe & Peacock, 2020). Additionally, framing theory states that how news or media portray these issues, influences how individuals form attitudes about them. Bolin and Hamilton (2018) make a similar statement: *"News media play a central role that can either be constructive, exposing their audience to different perspectives and evidence-based information, or manipulative and divisive."* (Bolin & Hamilton, 2018, p.15). Thus, according to these theories, the extent to which various media platforms cover climate change directly impacts individual's perception of its saliency. Moreover, the specific narratives presented in media content influence individuals' level of concern regarding climate change (Bolin & Hamilton, 2018). Consequently, a shift in media consumption habits could have profound implications on individuals' attitudes towards climate change.

A significant concern raised in research about non-traditional media, such as social media, is the relatively weaker oversight mechanisms on these internet platforms (Babutsidze et al., 2023). Social media have transformed communication and lowered entry barriers to accessing and sharing information due to their primary reliance on user-generated content (Zhuravskaya, Petrova, & Enikolopov, 2020). However, this user-generated content also allows for weaker editorial oversight, leaving more room for subjective interpretations of news content and the circulation of less credible information (Babutsidze et al., 2023). Consequently, content on social media may deviate from the scientific consensus that climate change is real, caused by humans and a global emergency. This observation extends across various internet sources, as most content on social media, blogs or discussion forums is user-generated and therefore bypasses traditional editorial control.

A recent study showed that throughout a heatwave in Belgium, a quarter of all tweets were climate sceptic (Moernaut, Mast, Temmerman, & Broersma, 2022). During that same timeframe, there was a near absence of climate sceptic news discourse in traditional media (Moernaut et al., 2022). The study highlights the contrasting depictions of climate change on traditional and social media platforms. The authors suggested that individuals whose viewpoints are marginalized in mainstream media see social media as a safe space to express their opinions (Moernaut et al., 2022). Building on this, I theorise that relying on user-generated content may diminish concern for climate change, as individuals might form their opinions based on news or information that lacks editorial oversight. The lack of editorial scrutiny facilitates the spread of less credible or unchecked information, potentially impacting perceptions of the severity of climate change.

In addition to the media content itself, user's selection and perception of that content also affect their attitudes (Dubois & Blank, 2018). In today's high-choice media environment, individuals can select media platforms –whether social media or online news– that reinforce and align with their existing beliefs (Dubois & Blank, 2018; Stroud, 2010). Van Eck, Mulder, and Van der Linden (2021) investigated the social media usage patterns of individuals with varying views about climate change. The authors discovered that the respondents primarily visited blogs that confirmed their opinions (Van Eck et al., 2021).

Additionally, research suggests that new media amplify 'confirmation bias' as people pay more attention to messages confirming their opinions (Babutsidze et al., 2023). Furthermore, algorithmic filter bubbles contribute to the formation of echo chambers (Babutsidze et al., 2023), wherein the content is filtered based on users' personal preferences, reinforcing their existing attitudes (Dubois & Blank, 2018). Despite the accessibility to counter-attitudinal exposure in the current media environment, studies generally indicate that individuals are inclined to click on like-minded articles or select political media with which they agree (Dubois & Blank, 2018; Hoewe & Peacock, 2020). This phenomenon is also known as the selection mechanism and selective exposure theory. It explains that individuals are more likely to select media and news confirming their beliefs (Hoewe & Peacock, 2020).

To summarize, non-traditional media are characterized by less editorial control than traditional media, allowing more dissemination of information about climate change that has not been fact-checked. Moreover, non-traditional media facilitate self-selection and provide easier entry into filter bubbles and echo chambers. These characteristics lead to the expectation that using non-traditional media will be associated with lower concern for climate change. Meanwhile, Al-Quran's (2022) research emphasised the continued relevance of traditional media for society, despite the growing popularity of non-traditional media. Their study states that many individuals use traditional media outlets to verify the reliability and credibility of news or information from social media platforms (Al-Quran, 2022). This theorising suggests that the use of traditional media can mitigate the potential adverse effects associated with non-traditional media consumption. Given these insights, it is crucial to

comprehend how the stronger reliance on non-traditional than traditional media is associated with climate change concerns. This leads to the following hypothesis:

***Hypothesis 1: Relying more strongly on non-traditional media than traditional media sources for news and information is associated with a lower level of concern for climate change.***

Does an individual's level of education or age moderate this association?

Beyond Hypothesis 1, this study also investigates whether the relationship between relying more strongly on non-traditional than traditional media and concern for climate change varies according to individual characteristics, in particular education and age. Empirical evidence suggests that these socio-demographic factors are associated with differing levels of concern for climate change (Flynn et al., 2021). For instance, the global opinion survey by the UNDP and the University of Oxford revealed significant differences in concern for climate change among different demographic groups, with more educated individuals and younger people exhibiting higher levels of concern (Flynn et al., 2021).

In the general hypothesis, it is theorised that individuals who rely more strongly on non-traditional than traditional media might be less concerned about climate change. This is attributed to several characteristics of non-traditional media: less editorial control in non-traditional media, easier entry to echo chambers and filter bubbles and more opportunities for selective exposure and confirmation bias. However, recent research presents a more nuanced perspective. Studies indicate that higher educated or better-informed individuals are better equipped to acquire online information and are more aware of their biases (Matthes & Schmuck, 2015). Consequently, they actively prevent selective exposure, stimulating the reception of diverse ideas, as they actively seek out varying perspectives and avoid echo chambers or biases (Van der Wurff, 2011). This leads to the expectation that higher education might decrease the likelihood self-selecting news that confirms existing opinions as higher educated individuals try to avoid selective exposure.

Furthermore, research by Hoewe and Peacock (2020) suggests that the effect of media usage on political attitudes is contingent on an individual's level of knowledge. Supporting this, the Eurobarometer survey on news and media (2023) revealed that individuals with higher education tend to actively search for news several times a day compared to lower-educated respondents (European Parliament, 2023). Recent insights revealed that while individuals with lower education levels may acquire more knowledge from audio-visual media such as television, there is no indication that higher-educated individuals benefit more from any specific type of media (Boukes & Vliegenthart, 2019). Additionally, Matthes and Schmuck (2015) suggest that education enhances the cognitive skills necessary to acquire knowledge correctly. Consequently, based on these findings, it is posited that high education might mitigate the negative aspects of using non-traditional media, as higher-educated individuals are theorised to be better at navigating online information.



This theorising leads to the expectation that individuals with higher education will be less affected by the negative effects of non-traditional media or at least less impacted than lower-educated individuals. It is speculated that the enhanced cognitive skills and bias awareness that characterises higher-educated individuals increases their ability to navigate non-traditional media. This leads to Hypothesis 2:

***Hypothesis 2: The negative association between relying more strongly on non-traditional media than traditional media for news and information and concern for climate change is weaker for higher educated individuals.***

As mentioned before, the global opinion study conducted by the UNDP and the University of Oxford show that younger individuals have higher levels of climate change concern compared to older individuals (Flynn et al., 2021). Additionally, the news and media Eurobarometer survey also found distinctions in traditional versus non-traditional media use for different age groups (European Parliament, 2023). The survey found that younger participants are more likely to use social media (59% vs. 24%) and all other non-traditional media platforms, such as video platforms, message apps, podcasts and blogs. Meanwhile, older respondents make far greater use of traditional media platforms in comparison (European Parliament, 2023). However, the 11-percentage point increase in mentions of social media use within one year, as mentioned earlier, was observed in all age groups. These empirical findings suggest that age might moderate the relationship between relying more strongly on non-traditional than traditional media and concern for climate change.

The generational difference in concern or belief in climate change has been explored in various studies (Ballew et al., 2019; Pickard, Bowman, & Arya, 2020; Milfont, Zubielevitch, Milojev and Sibley, 2021). Milfont et al. (2021) explained that as older individuals initially started from a lower baseline of belief, their average concern for climate change might still be lower. Even though the climate change belief levels have been steadily increasing at a similar rate for all age groups in the past decades, the initial lower level of belief in climate change for older generations are still noticeable when exploring the age distinctions in concern for climate change (Milfont et al., 2021).

Agenda-setting theory states that the public's perception of an issue's saliency is directly linked to the media coverage (Hoewe & Peacock, 2020). As climate change has been one of society's most important challenges in the media over the past decade, younger individuals have experienced relatively higher exposure to climate change-related media content. This could contribute to their higher level of concern for climate change. It has also been suggested that younger individuals' level of concern is higher since they have already had relatively more exposure to the effects of global warming than their parents and grandparents (Ballew et al., 2019). Additionally, Milfont et al. (2021) further theorised that younger individuals' concern for climate change is higher as they anticipate experiencing all the societal and personal consequences of climate change first-hand. This generational difference in exposure to the

effects of global warming and climate change-related media content (Ballew et al., 2019) and future perspectives suggests that younger individuals will continuously be very concerned about climate change and, therefore, might not be as affected by stronger reliance on non-traditional than traditional media in forming their climate change concern attitudes.

Social identity theory provides additional insights into how age might moderate the hypothesised negative association (Hypothesis 1). Social identity theory explains that when social identity is salient, the similarities within the ingroup and differences with the outgroup become accentuated, resulting in the assimilation of ingroup members' attitudes and behaviours to ingroup norms and away from the outgroup norms (Fielding & Hornsey, 2016). Applied in this context, as younger individuals have had relatively more exposure to the effects of global warming and they anticipate experiencing the consequences of climate change first-hand, it is expected that they identify more strongly with environmental issues. This strong identification with environmental issues among younger individuals results in the assimilation of their climate change attitudes and reinforcement of their pre-existing attitudes.

Müller et al. (2017) applied social identity theory to explain political polarization due to media coverage. Their application suggests that the assimilation of attitudes due to a strong social identity leads to the reinforcement of attitudes regardless of how it is portrayed in media. Applying this theory in this context, the above-described strong identification of younger individuals with environmental issues leads to the assimilation of their climate change attitudes, regardless of whether the media content is climate sceptic, the media coverage will only reinforce their pre-existing attitudes. As described before, Hypothesis 1 expects that relying more strongly on non-traditional than traditional media is associated with lower concern for climate change. However, applying the social identity theory, it is expected that pre-existing attitudes of younger individuals who identify strongly with environmental issues, will only be reinforced, regardless of how climate change is framed in either traditional or non-traditional media. This leads us to expect that younger individuals will be less affected by stronger reliance on non-traditional than traditional media.

In summary, the generational differences in exposure to climate change-related media content and global warming effects, the stronger identification of young people with environmental issues and the anticipation of first-hand experience with the consequences of climate change suggest that the negative association between relying more strongly on non-traditional and traditional media and concern for climate change (Hypothesis 1) might be weaker for younger individuals. This leads to the following hypothesis:

***Hypothesis 3: The negative association between relying more strongly on non-traditional media than traditional media for news and information and concern for climate change is weaker for younger individuals.***

## Methods and data

To investigate the association between relying more strongly on non-traditional than traditional media and concern for climate change, this study employs a correlational research design. This design is fit to test the hypothesised negative association and to explore whether the socio-demographic factors—age and education—moderate this relationship. The research utilises existing quantitative data from the European Social Survey (ESS), which is analysed using Stata. The study exclusively relies on anonymised secondary data from ESS. The use of anonymized data ensures that no ethical issues or privacy concerns are present.

### Data description

The ESS is a pan-European research infrastructure providing accessible data through the organisation of cross-national surveys about attitudes and behaviours since 2001 (ESS ERIC, 2024). *“Every two years, face-to-face interviews are conducted with newly selected, cross-sectional samples”* (ESS ERIC, 2024). The ESS rounds are representative samples for all individuals above 15 who are residents in a private household, regardless of nationality, citizenship, language or legal status in that country. This study uses ESS Round 10 data (ESS10), which is the most recently published round of data. ESS10 covers the necessary data topics: concern for climate change, education, age and other socio-demographic factors. The data in Belgium were collected between the 27<sup>th</sup> of October 2021 and the 3<sup>rd</sup> of September 2022 (ESS ERIC, 2023). The ESS10 in Belgium had a response rate of 39,19% (1371 respondents).

The data from ESS round 10 are complemented with CRONOS-2 Wave 6 data. CRONOS-2 Wave 6 provides data about traditional and non-traditional media consumption. CRONOS-2 is a cross-national online survey panel conducted in 12 countries alongside ESS10, which allows us to merge the Belgian ESS10 and CRONOS-2 Wave 6 data (ESS ERIC, 2023). The Belgian CRONOS-2 data were collected between 15<sup>th</sup> of September 2022 and 29<sup>th</sup> of September 2022. CRONOS-2 Wave 6 had a response rate of 63% (559 respondents). The combination of CRONOS-2 Wave 6 and ESS10 is the only available data that fits the context and provides data on all relevant variables.

### Operationalization

#### Dependent variable

Concern for climate change, the outcome variable, is measured using the question: *“How worried are you about climate change?”* from the ESS10 questionnaire (European Social Survey, 2020, p. 29). Respondents’ level of concern are indicated on a 5-point scale: 1) not at all worried, 2) not very worried, 3) somewhat worried, 4) very worried and 5) extremely worried. This measure aligns with previous studies investigating how worried European citizens are about climate change (Mato, Jesus, Cano-Díaz, & Dos-Santos, 2023). In this study, **Concern for climate change** is measured by this continuous variable.

### Independent variable

The independent variable should reflect the relative use of non-traditional over traditional media. CRONOS-2 Wave 6 assesses respondent's traditional and non-traditional media consumption frequency, using the following questions:

- 1) How often do you watch or read about politics and current affairs via traditional media (on public or commercial television, radio, national or local newspapers, or their online outlets)?
- 2) How often do you watch or read about politics and current affairs via blogs, discussion forums or social media, other than the online outlets of traditional media?

Responses are provided on the following 5-point scale: 1) never, 2) only occasionally, 3) a few times a week, 4) most days or 5) every day (ESS ERIC, 2023). Notably, the conceptualisation of traditional and non-traditional media in the questionnaire reflects the definitions outlined in the theoretical framework.

To obtain a measure reflecting the **relative consumption of non-traditional over traditional media**, a new variable is generated by subtracting the values of traditional media use from those of the non-traditional media use. Thus, the new continuous variable, '**relative consumption of non-traditional over traditional media**'<sup>1</sup>, ranges from -4 to 3. A negative value indicates a higher reliance on traditional media. A positive value indicates higher reliance on non-traditional media. A value of zero suggests a balanced use of non-traditional and traditional media. This measure provides insights in individuals media use, specifically revealing whether an individual relies more heavily on non-traditional, traditional media or maintains a more balanced media diet.

### Moderators

Two moderators, **age and education**, are included to explore how the relationship varies across different subgroups. In the baseline model both moderators, age and education, are used as control variables. **Age** is a variable calculated using the respondent's birth year. The continuous variable, **age**, represents the age of respondents in years.

**Education level** is measured in terms of the highest level of education the respondent has completed. ESS10 assesses the highest level of education that participants have completed based on the International Standard Classification of Education (ISCED) scale (Eurostat, 2023). The ISCED 2011 has 9 education levels: ISCED 0: Early childhood education ('less than primary' for educational attainment), ISCED 1: Primary education, ISCED 2: Lower secondary education, ISCED 3: Upper secondary education, ISCED 4: Post-secondary non-tertiary education, ISCED 5: Short-cycle tertiary education, ISCED 6: Bachelor's or equivalent level, ISCED 7: Master's or equivalent level and ISCED 8: Doctoral or equivalent level. The variable is categorised into three levels: low education (ISCED 0-2), medium education (ISCED 3 – 4) and high education (ISCED 5 – 8). In the regression analysis, low education serves as the reference category.

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<sup>1</sup> Relative 'consumption' and 'use' of non-traditional over traditional media are used interchangeably.

### Control variables

In addition to the primary variables, the analysis will include two control variables: **gender** and **total media use**. Previous research has indicated slight gender differences in climate change concern, with women generally exhibiting higher levels of concern than men (McCright, 2010; Flynn, et al., 2021). Furthermore, the Eurobarometer also identified slight differences in media consumption habits based on gender (European Parliament, 2023). Gender is a binary variable in the ESS10 dataset, where respondents are categorized as 1 = male and 2 = female.

The second control variable is **total media use**. This variable is included as individuals with very high media use might be expected to be more informed, which could potentially impact their level of concern regarding climate change. It is also theorised that more information about a specific issue increases an individual's ability to critically analyse information (Matthes & Schmuck, 2015). Additionally, it is speculated that the impact of media use on political attitudes also depends on the amount of information individuals had beforehand (George & Robinson-Weber, 1983).

**Total media use** is generated from the same raw variables as the independent variable, 'relative consumption of non-traditional over traditional media'. Rather than subtracting the values of traditional media from the non-traditional media values, the values are added up to create a variable that reflects the overall media use of respondents. Therefore, this continuous variable encompasses the sum of traditional and non-traditional media use, where the values range from 2 to 10.

### Method

While acknowledging that the dependent variable is ordinal in nature, for the purposes of the analysis, it will be treated as a continuous variable. In doing so, it is possible to employ a multiple linear ordinary least squares (OLS) regression model. To address this potential limitation, a robustness check is conducted with ordered and binary logit regression models. The OLS regression model allows an examination of how a one-unit change in the relative use of non-traditional over traditional media influences concern for climate change and how these changes might vary across distinct age and education groups.

While the measures of these variables are not a perfect fit, the combination of the ESS10 and CRONOS-2 Wave 6 provides a representative sample that covers all variables necessary for addressing the research question. Given the scarcity of data sets covering both climate change concerns and media consumption habits, this is the best fit for the context. Additionally, CRONOS-2 Wave 6 is an online survey, meaning that only respondents who are 18+ with access to internet were allowed to participate. This could introduce biases in the sample, as it excludes individuals with no regular access to internet. By acknowledging and understanding these possible biases or limitations, I can ensure a nuanced analysis of the results.

## Results

This section presents the findings from the statistical analyses conducted to test the proposed hypotheses. In the first part, an overview is provided of the descriptive statistics, summarizing the main variables included in the study. Following this, the results of the multiple linear OLS regression analyses are presented in Table 2 and interpreted for each hypothesis. Additionally, the study includes visual representations to further interpret the interactions from Hypothesis 2 and 3 (Brambor, Clark, & Golder, 2006). Lastly, some alternative models and model specifications are tested and interpreted to test the robustness of the results.

### Descriptive statistics

Table 1 presents the descriptive statistics for the main variables included in the study. The average concern for climate change among respondents is 3.39, indicating a significant level of concern for climate change, falling between somewhat worried (level 3) and very worried (level 4). The mean score of -1.32 for the relative reliance on non-traditional over traditional media suggests a general tendency of the respondents to rely more on traditional than non-traditional media.

The socio-demographic characteristics of the sample are also summarized. Respondents ages range from 18 to 90 years, with a mean age of 50 years. Regarding educational attainment, 13.4% of the sample have a low level of education, 31.2% have a medium level and 55.4% have a high level. The mean of gender, 1.49, suggests a balanced gender distribution in the sample. Additionally, the average total media use score is 5.82.

**TABLE 1:** Descriptive statistics.

|  | <i>n</i> | Mean  | Standard deviation | Min | Max |
|--|----------|-------|--------------------|-----|-----|
| <i>Dependent variable</i>                                      |          |       |                    |     |     |
| Climate change concern   | 559      | 3.39  | 0.89               | 1   | 5   |
| <i>Independent variable</i>                                    |          |       |                    |     |     |
| Relative consumption of non-traditional over traditional media | 545      | -1.32 | 1.43               | -4  | 3   |
| <i>Moderators</i>  |          |       |                    |     |     |
| Age  | 559      | 50.15 | 16.21              | 18  | 90  |
| Education  |          |       |                    |     |     |
| 1. Low (ref.)  | 545      | 0.13  |                    | 0   | 1   |
| 2. Medium  | 545      | 0.31  |                    | 0   | 1   |
| 3. High  | 545      | 0.55  |                    | 0   | 1   |
| <i>Control variables</i>                                       |          |       |                    |     |     |
| Gender   | 548      | 1.49  |                    | 1   | 2   |
| Total media use  | 545      | 5.82  | 1.89               | 2   | 10  |

## Regression results

Table 2 presents the results from the OLS regression. Model 1 in the first column corresponds with the results for the baseline model, which is used to test Hypothesis 1. Model 2 introduces the interaction effect between ‘relative use of non-traditional over traditional media’ and education level (testing Hypothesis 2). Lastly, Model 3 examines Hypothesis 3 by introducing the interaction effect between ‘relative use of non-traditional over traditional media’ and age.

**TABLE 2:** Ordinary Least Squares linear regression estimates for climate change concern.

| Variables   | Model 1             | Model 2             | Model 3             |
|---|---------------------|---------------------|---------------------|
| Relative consumption of non-traditional over traditional media (RCoNToTM) | -0.039<br>(0.028)   | -0.026<br>(0.090)   | 0.014<br>(0.088)    |
| Low Education * RCoNToTM (Ref.)   | -                   | -                   | -                   |
| Medium Education * RCoNToTM   |                     | 0.023<br>(0.100)    |                     |
| High Education * RCoNToTM   |                     | -0.034<br>(0.097)   |                     |
| Age * RCoNToTM  |                     |                     | -0.001<br>(0.002)   |
| Low education (ref.)  | -                   | -                   | -                   |
| Medium Education  | 0.104<br>(0.126)    | 0.131<br>(0.168)    | 0.105<br>(0.126)    |
| High Education  | 0.329***<br>(0.124) | 0.285*<br>(0.167)   | 0.330***<br>(0.125) |
| Age (in years)  | 0.002<br>(0.002)    | 0.002<br>(0.002)    | 0.000<br>(0.003)    |
| Gender  | 0.140*<br>(0.075)   | 0.143*<br>(0.076)   | 0.139*<br>(0.076)   |
| Total Media Use   | 0.059***<br>(0.022) | 0.059***<br>(0.022) | 0.059***<br>(0.022) |
| Constant  | 2.488***<br>(0.232) | 2.491***<br>(0.240) | 2.545***<br>(0.254) |
| <i>n</i>  | 542                 | 542                 | 542                 |
| R <sup>2</sup>  | 0.055               | 0.057               | 0.056               |

Note: OLS unstandardised coefficients. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

The results from the baseline model indicate a non-significant negative effect of ‘relative consumption of non-traditional over traditional media’ on concern for climate change. The coefficient, -0.039, suggests that a one-unit increase in ‘relative consumption of non-traditional over traditional media’ is associated with a decrease in concern for climate change. In other words, relying more strongly on non-traditional than traditional media decreases the level of concern for climate change. However, as the coefficient is not statistically significant ( $p=0.165$ , see appendix Table 6), the baseline model does not provide evidence to support the hypothesised negative association (rejecting Hypothesis 1).

The second column in Table 2 illustrates the regression results of Model 2, which tests Hypothesis 2 by incorporating the interaction term with education to the baseline model. The education level interaction term does not reach statistical significance (*Medium*:  $p=0.817$  and *High*:  $p=0.724$ , see appendix Table 6). Therefore, the analysis does not provide sufficient evidence to support Hypothesis 2 (rejecting *Hypothesis 2*). The interaction effect between education and ‘relative consumption of non-traditional over traditional media’ is also visually presented and analysed in two distinct ways in Figure 1 to ensure a correct interpretation (Brambor et al., 2006).

**FIGURE 1:** Visual representation of the interaction effect between ‘relative consumption of non-traditional over traditional media’ and education including a 95% confidence interval. Panel 1: Conditional marginal effect of ‘relative consumption of non-traditional over traditional media’ on concern for climate change (y-axis) by education level (x-axis). Panel 2: Association between ‘relative consumption of non-traditional over traditional media’ (x-axis) and concern for climate change (y-axis) per education level.

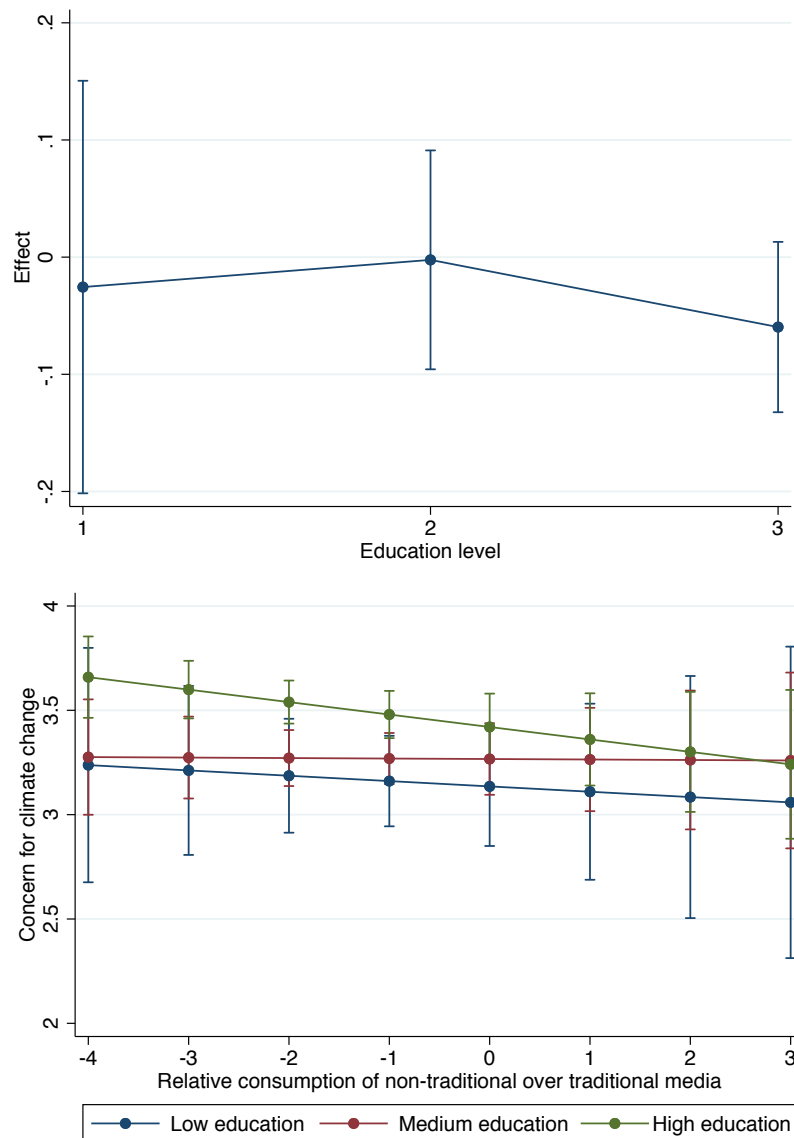




Figure 1 (p.16) displays the plotted interactions. The first panel of Figure 1 depicts the average conditional marginal effect of 'relative use of non-traditional over traditional media' on concern for climate change for the different education levels, along with a 95% confidence interval. A small negative effect is observed for low education, no effect for medium education and the strongest, and yet still very small, negative effect for high education. This pattern implies that the negative effect of relying more strongly on non-traditional media than traditional is the most pronounced for high educated respondents. So, this observed pattern is inconsistent with the hypothesised relationship as it was expected that the negative effect of relying more strongly on non-traditional than traditional media on concern for climate change would be the strongest for low educated and weakest for higher educated. However, it is important to note that these effects are very small and do not significantly differ.

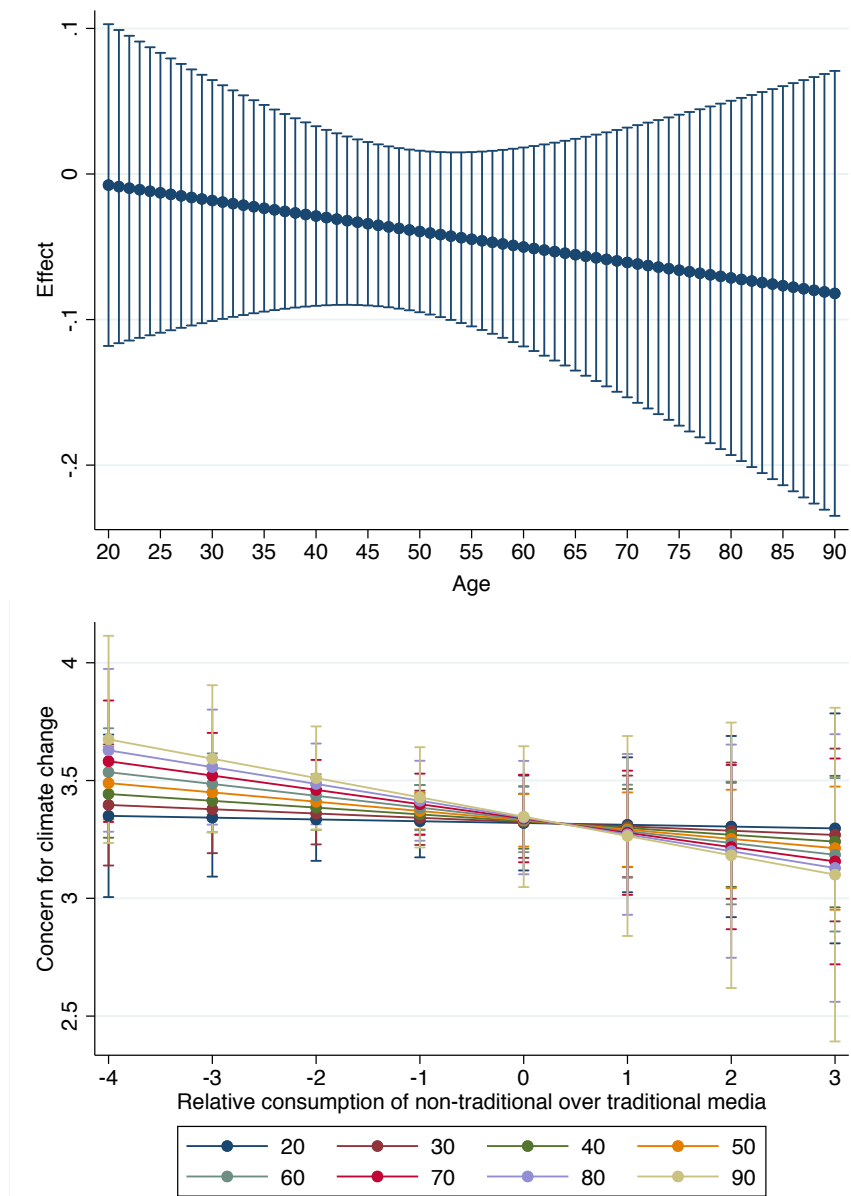
The second panel in Figure 1 (p.16) graphs the relationship between 'relative use of non-traditional over traditional media' and concern for climate change for the different education groups with a 95% confidence interval. The figure can be interpreted by examining the slopes of the different education groups. The same observations are made as in the first panel. The 'relative use of non-traditional over traditional media' does not appear to affect concern for climate change at the medium education level, as the slope is nearly flat. For high and low education, higher reliance on non-traditional media seems to be associated with lower concern for climate change, since both groups have a downward slope. The pattern observed in panel 2 is again inconsistent with the hypothesised relationship. However, the 95% confidence interval highlight that the pattern is not statistically significant. Overall, the visual evidence from Figure 1 supports the conclusion that Hypothesis 2 can be confidently rejected.

Model 3 considers the moderating effect of age by including the interaction effect between 'relative use of non-traditional over traditional media' and age. The results for testing Hypothesis 3 are displayed in the third column of Table 2 (p.15). Notably, the interaction term does not reach statistical significance ( $p=0.724$ ; see *appendix Table 6*), rendering the interpretation substantively meaningless. Consequently, in this sample and model, there is no evidence to support the hypothesis that age moderates the association between 'relative use of non-traditional over traditional media' and climate change concern (rejecting *Hypothesis 3*). The interaction effect between age and 'relative consumption of non-traditional over traditional media' is also visually presented and analysed in two distinct ways in Figure 2 to ensure a correct interpretation (Brambor et al., 2006).

Figure 2 (p.18) presents the interaction effect between 'relative use of non-traditional over traditional media' and age. The first panel depicts the average conditional marginal effect of 'relative use of non-traditional over traditional media' on concern for climate change across various ages, along with a 95% confidence interval. It reveals that the small negative effect appears to intensify slightly with age. While these observations align somewhat with the theoretical framework, they do not confirm the hypothesis. Especially since the confidence

intervals in the figure illustrate that there is a lot of uncertainty about the portrayed relationship.

**FIGURE 2:** Visual representation of the interaction effect between ‘relative consumption of non-traditional over traditional media’ and age including a 95% confidence interval. Panel 1: Conditional marginal effect of the ‘relative consumption of non-traditional over traditional media’ on concern for climate change (y-axis) by the respondents age (x-axis). Panel 2: Association between ‘relative consumption of non-traditional over traditional media’ (x-axis) and concern for climate change (y-axis) per age group.



In the second panel, each line represents an age group, illustrating the level of concern for climate change each age group exhibits for different values of ‘relative use of non-traditional over traditional media’ with a 95% confidence interval. The figure demonstrates that the older the age group, the more their concern for climate change is negatively affected by stronger reliance on non-traditional than traditional media. However, the 95% confidence interval

again illustrates that the effects are not statistically significant. This visual representation of the interaction effect between age and 'relative consumption of non-traditional over traditional media' corroborates the findings of Model 3 in Table 2. Indicating that there is no evidence to support the notion that age moderates the relationship (rejecting *Hypothesis 3*).

### Robustness checks

In order to assess the robustness of the regression results, a sensitivity analysis is performed to test the effect of using different models and model specifications. The data description highlighted that the outcome variable, while ordinal in nature, was treated as continuous for the purpose of the analysis. To ensure robustness of the findings, the analysis will first be replicated with two alternative models: binary and ordinal logit. Additionally, in a third robustness check the two interaction effects are modelled simultaneously, testing the moderating effect of age and education on the hypothesised negative association. This is tested for all three models, i.e. OLS, binary logit and ordinal logit regression.

In order to replicate the analysis using a binary logit model, a binary variable of climate change concern is required. In order to get this binary variable, level 1 and 2 of the 5-point scale of the above defined outcome variable (concern for climate change, p.11) are considered as not worried (not Worried = 0), while level 3, 4 and 5 are considered as worried (worried = 1).

### Binary logit model

Table 3 denotes the results of the binary logit regression analysis. The table maintains the same structure as the OLS regression results. Column 1 in Table 3 corresponds with the baseline model, while Model 2 and 3 introduce the interaction terms for education level and age, respectively.

The baseline model results show a statistically significant negative log odds coefficient (*Log odds* = -0.227,  $p = 0.038$ ; see *appendix Table 7*) for the independent variable. This implies that a one-unit increase in 'RCoTaNTM' has a negative effect on climate change concern. The binary logit regression coefficients provide a more intuitive interpretation when transformed into odds ratios. This can be done using this formula<sup>2</sup>:  $Exp(\beta_i) = e^{\beta_i}$ . The odds ratio of 'RCoNToTM' translates to 0.797, which means that a one-unit increase in 'RCoNToTM' decreases the odds of being worried about climate change by 20.3%<sup>3</sup>. This supports Hypothesis 1, demonstrating a negative association between stronger reliance on non-traditional than traditional media on concern for climate change. This will be considered further in the discussion.

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<sup>2</sup> If the coefficient for variable  $i$  is  $\beta_i$ , then the odds ratio is  $e^{\beta_i}$ . We can interpret the odds ratio as a percentage after this formula:  $[(e^{\beta_i} - 1) * 100]$ . If the sign is negative (positive) then the odds of concern for climate change are lower (or higher).

<sup>3</sup> In this case, the coefficient for the independent variable is -0.227. When the formula is applied:  $e^{-0.227}$ , the odds ratio = 0.797. This can be interpreted as a percentage for ease:  $(0.797 - 1) * 100 = -20.3\%$

The other binary regression results are consistent with the result from the OLS regression. The interaction terms for education (*Medium education:  $p=0.634$  and High education:  $p=0.760$ ; see appendix Table 7*) and age ( $p=0.204$ ; see appendix Table 7) are not statistically significant. So, there is no evidence to support Hypotheses 2 or 3.

**TABLE 3:** Binary logit regression estimates for climate change concern.

| Variables   | Model 1             | Model 2            | Model 3            |
|---|---------------------|--------------------|--------------------|
| Relative consumption of non-traditional over traditional media (RCoNToTM) | -0.227**<br>(0.109) | -0.319<br>(0.239)  | -0.319<br>(0.239)  |
| Low education * RCoNToTM (ref.)   | -                   | -                  | -                  |
| Medium education * RCoNToTM   |                     | 0.149<br>(0.312)   | 0.149<br>(0.312)   |
| High education * RCoNToTM   |                     | 0.085<br>(0.278)   | 0.085<br>(0.278)   |
| Age * RCoNToTM  |                     |                    | 0.009<br>(0.007)   |
| Low education (ref.)  | -                   | -                  | -                  |
| Medium education  | 0.355<br>(0.368)    | 0.466<br>(0.431)   | 0.466<br>(0.431)   |
| High education  | 0.687*<br>(0.367)   | 0.743*<br>(0.417)  | 0.743*<br>(0.417)  |
| Age   | -0.002<br>(0.009)   | -0.003<br>(0.009)  | -0.003<br>(0.009)  |
| Gender  | 0.563**<br>(0.277)  | 0.556**<br>(0.278) | 0.556**<br>(0.278) |
| Total Media Use   | 0.057<br>(0.070)    | 0.057<br>(0.071)   | 0.057<br>(0.071)   |
| Constant  | 0.207<br>(0.788)    | 0.162<br>(0.786)   | 0.162<br>(0.786)   |
| <i>n</i>  | 542                 | 542                | 542                |
| Pseudo R <sup>2</sup>   | 0.042               | 0.043              | 0.047              |

Note: Log odds coefficients. Robust standard errors in parentheses. \*\*\*  $p<0.01$ , \*\*  $p<0.05$ , \*  $p<0.1$

#### Ordinal logit model

Table 4 presents the findings from the ordinal logistic regression analysis, which follows the same order as Table 2. Column 1 displays the baseline model, while Model 2 and 3 incorporate the interaction terms for education level and age, respectively.

The results of the ordinal logit regression align closely with the OLS regression results. The ordered log odds coefficient of the independent variable (*ordered log odds* = -0.088,  $p=0.151$ ; see appendix Table 8) is also not statistically significant. Similarly, the interaction terms for age and education also do not reach statistical significance (*Interaction Age:  $p=0.317$ , Interaction Medium education:  $p=0.924$  and Interaction High education:  $p=0.631$ ; see appendix Table 8*). These results indicate that the OLS regression results are robust as the ordinal logit regression results do not provide evidence to support Hypotheses 1, 2 or 3 either.

**TABLE 4:** Ordinal Logit regression estimates for climate change concern.

| Variables   | Model 1              | Model 2              | Model 3              |
|---|----------------------|----------------------|----------------------|
| Relative consumption of non-traditional over traditional media (RCoNToTM) | -0.088<br>(0.061)    | -0.036<br>(0.186)    | 0.101<br>(0.196)     |
| Low education * RCoNToTM (ref.)   | -                    | -                    | -                    |
| Medium education * RCoNToTM   |                      | 0.020<br>(0.212)     |                      |
| High education * RCoNToTM   |                      | -0.097<br>(0.202)    |                      |
| Age * RCoNToTM  |                      |                      | -0.004<br>(0.004)    |
| Low education (ref.)  | -                    | -                    | -                    |
| Medium education  | 0.291<br>(0.276)     | 0.323<br>(0.378)     | 0.294<br>(0.279)     |
| High education  | 0.807***<br>(0.276)  | 0.683*<br>(0.376)    | 0.813***<br>(0.279)  |
| Age   | 0.005<br>(0.005)     | 0.006<br>(0.005)     | 0.001<br>(0.008)     |
| Gender  | 0.241<br>(0.161)     | 0.249<br>(0.162)     | 0.237<br>(0.161)     |
| Total Media Use   | 0.128***<br>(0.049)  | 0.130***<br>(0.049)  | 0.130***<br>(0.048)  |
| /cut1   | -1.879***<br>(0.578) | -1.896***<br>(0.596) | -2.091***<br>(0.631) |
| /cut2   | -0.007<br>(0.513)    | -0.025<br>(0.536)    | -0.221<br>(0.569)    |
| /cut3   | 2.308***<br>(0.527)  | 2.289***<br>(0.549)  | 2.096***<br>(0.575)  |
| /cut4   | 4.269***<br>(0.553)  | 4.255***<br>(0.571)  | 4.063***<br>(0.595)  |
| <i>n</i>  | 542                  | 542                  | 542                  |

Note: Ordered log odds coefficients. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

#### Two interactions modelled simultaneously

In Table 5, the two interaction terms are modelled simultaneously for all three models, respectively OLS, binary logit and ordinal logit regression. So, in this robustness check, the interaction between 'relying more strongly on non-traditional than traditional media' and education as well as the interaction between 'relying more strongly on non-traditional than traditional media' and age are included in the same model.

Similarly, to the OLS regression results, the interaction terms for age and education do not reach statistical significance for any of the different models (*p-values too high; see appendix Table 9*). This implies again that the results of the analysis are robust and there is no evidence to support the hypothesis that education level or age moderate this relationship.

**TABLE 5:** Two interaction terms modelled simultaneously in different models.

| Variables  | Model 1: OLS<br>regression | Model 2:<br>Binary logit | Model 3:<br>Ordinal logit |
|--|----------------------------|--------------------------|---------------------------|
| Relative consumption of non-traditional<br>over traditional media (RCoNToTM) | 0.028<br>(0.127)           | -0.762*<br>(0.415)       | 0.169<br>(0.294)          |
| Low education* RCoNToTM  | -                          | -                        | -                         |
| Medium education* RCoNToTM   | 0.018<br>(0.101)           | 0.156<br>(0.294)         | 0.001<br>(0.224)          |
| High education* RCoNToTM   | -0.037<br>(0.098)          | 0.086<br>(0.256)         | -0.112<br>(0.216)         |
| Age * RCoNToTM   | -0.001<br>(0.002)          | 0.009<br>(0.007)         | -0.004<br>(0.004)         |
| Age  | 0.001<br>(0.003)           | 0.004<br>(0.0100)        | 0.001<br>(0.008)          |
| Low education  | -                          | -                        | -                         |
| Medium education   | 0.126<br>(0.169)           | 0.471<br>(0.433)         | 0.304<br>(0.393)          |
| High education   | 0.283*<br>(0.169)          | 0.731*<br>(0.416)        | 0.673*<br>(0.393)         |
| Gender   | 0.142*<br>(0.076)          | 0.575**<br>(0.279)       | 0.246<br>(0.161)          |
| Total media use  | 0.060***<br>(0.022)        | 0.056<br>(0.072)         | 0.132***<br>(0.049)       |
| /cut1  |                            |                          | -2.123***<br>(0.667)      |
| /cut2  |                            |                          | -0.255<br>(0.611)         |
| /cut3  |                            |                          | 2.063***<br>(0.613)       |
| /cut4  |                            |                          | 4.034***<br>(0.629)       |
| Constant   | 2.548***<br>(0.265)        | -0.157<br>(0.834)        |                           |
| <i>n</i>   | 542                        | 542                      | 542                       |
| R <sup>2</sup>   | 0.057                      | 0.048                    | /                         |

Note: Respectively OLS unstandardised, log odds and ordered log odds coefficients.  
Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Discussion and conclusion

The aim of this study was to answer this research question: *“What is the association between relying more strongly on non-traditional than traditional media and concern for climate change, and how does the relationship vary across different ages and education groups?”*. Building on existing literature, I theorised that relying more strongly on non-traditional than traditional media would be associated with a lower level of concern for climate change (Hypothesis 1). Additionally, the study explored whether age and education level moderate the relationship. Specifically, Hypotheses 2 and 3, expected the hypothesised negative association would be weaker for higher educated individuals and younger individuals, respectively. To test these hypotheses, an OLS multiple linear regression model was applied to Belgian data from ESS Round 10 and CRONOS-2 Wave 6.

The regression results did not reveal any statistically significant coefficients for the independent variable ‘relative use of non-traditional over traditional media’ or for the interaction terms with education level and age. The results indicate that a) there is no direct association between relying more strongly on non-traditional than traditional media and concern for climate change, and b) the association is not moderated by age or education. Thus, this study found no evidence to support Hypotheses 1, 2 or 3. Moreover, the models’ low R-squared (0.055), as shown in Table 2 (p.15), further indicates that the independent variable only explains very little of the variation in the dependent variable. To validate these results, the interaction terms for the moderators were visualised as recommended by Brambor et al. (2006). The figures (p.16-18) confirmed that age and education do not significantly moderate the association. Consequently, this study can confidently reject Hypotheses 1, 2 and 3 for this sample and regression model in the Belgian context.

Building on the findings that political attitudes are influenced by media content and user’s selection and perception, and considering the proliferation of media, this research initially hypothesised about the association between reliance on non-traditional over traditional media and climate change concern (Dubois & Blank, 2018; Hoewe & Peacock, 2020). Non-traditional media is typically characterised by less editorial control, easier entry to echo chambers and algorithmic filters and increased opportunities for self selection (Babutsidze et al., 2023; Van Eck et al., 2021). Al-Quran’s (2022) research emphasised the persisting importance of traditional media for society, specifically through using it to verify information from non-traditional media sources. Therefore, it was hypothesised that relying more strongly on non-traditional than traditional media is associated with lower concern for climate change. However, contrary to the expectations, the findings revealed that there is no negative association in Belgium (at least not in the studied sample).

In light of these findings, it is essential to revisit the theoretical framework and explore aspects of the study that could potentially explain the absence of the hypothesised negative association. An assumption in the initial theorising was that individuals would have the same amount of trust in the information from traditional and non-traditional media. However, Al-Quran’s (2022) research highlighted that traditional media was used by individuals to confirm

or test the reliability of information found on non-traditional media sources. This notion allows for reasonable doubt or even implies that individuals might have lower levels of trust in non-traditional media than traditional media. Moreover, Gainous, Abbott and Warner (2019) found that the effect of media on political attitudes is mitigated by the amount of trust individuals have in the medium they use. Based on the perception that individuals might have lower levels of trust in non-traditional than traditional media and the idea that trust mitigates the effect of media on political attitudes, it could also be hypothesised that relative use of non-traditional over traditional media might not significantly affect the level of concern for climate change. More specifically, it could be expected that the association in Hypothesis 1 is mitigated by the amount of trust individuals have in traditional and non-traditional media.

Another consideration is the assumption that non-traditional and traditional media significantly differ in their climate change-related content. This study did not conduct a content analysis, which, in retrospect, could provide insights into why the hypothesised negative association between relying more strongly on non-traditional than traditional media and concern for climate change was not observed. As discussed in the theoretical framework, media content can significantly influence individuals' opinions about the urgency of climate change, as explained through framing and agenda-setting theory (Dubois & Blank, 2018; Hoewe & Peacock, 2020). A study by Moernaut et al. (2022) compared Belgian twitter content to traditional media content regarding climate change during a heatwave, which confirmed the idea that non-traditional media content was more sceptical about climate change. However, the twitter content analysed in the Moernaut et al.'s (2022) study was collected in the summer of 2018, while no other content analysis was conducted in this study corresponding with the period that ESS10 and CRONOS-2 Wave 6 data were collected.

The absence of such a content analysis for the relevant timeframe suggests the possibility that, in the Belgian context, there might have been no significant difference in how climate change was portrayed on traditional and non-traditional media during the data collection period. If there was in fact no significant difference in the climate change-related content on the two media types, this could explain the absence of a negative association.

This highlights the importance of contextual information in understanding the effect of media use on concern for climate change. It raises the question of whether there is in fact no significant association between relying more strongly on non-traditional than traditional media, or if it is context dependent. Incorporating a content analysis in future research could enhance the quality of the study by providing crucial contextual information. Moreover, it will help determine whether the absence of an association as found in this study, reflects a general pattern or whether it exists but varies depending on the media content differences.

Additionally, this study also explored the moderating effect of education and age on the negative association between relying more strongly on non-traditional than traditional media and concern for climate change. It was anticipated that the negative association would be weaker for higher educated individuals as they were better able at navigating and interpreting



non-traditional media. Their ability to critically analyse acquired information would mitigate the adverse effects of relying more on non-traditional media. However, the results indicate that education level does not moderate the association in the Belgian context.

Reflecting on the absence of a content analysis, the possibility that there is no significant difference in the climate change-related content on non-traditional and traditional media could also explain why no moderating effect of education was observed. The critical evaluation skills of higher educated individuals may add very little value in differentiating levels of climate change concern if there is in fact no significant difference between the non-traditional and traditional media content.

Alternatively, the theory underlying Hypothesis 2 might point more at the relevance of being better informed rather than at the moderating effect of education. Matthes & Schmuck (2015) theorised that better-informed and higher educated individuals are better at navigating online platforms and able to critically analyse acquired information. It was also speculated that the amount of information individuals had beforehand affected how much media content could influence their political attitudes (George & Robinson-Weber, 1983). Therefore, these results may suggest that total media use is more relevant than reliance on non-traditional over traditional media and education as a moderator.

For the second moderator, i.e. age, it was initially suspected that the hypothesised association would be weaker for younger individuals. Their future perspectives and higher relative exposure to both climate change-related media content and the effects of global warming would maintain their concern for climate change regardless of their non-traditional and traditional media use (Ballew, et al., 2019; Milfont et al., 2021; Pickard et al., 2020). Contrary to the expectations, the study found no robust evidence to support Hypothesis 3, indicating that age does not moderate this relationship. These findings suggest that older individuals' concern for climate change might also not be significantly affected by stronger reliance on non-traditional than traditional media in the Belgian context. As established in the previous paragraphs, it is important to keep in mind that exposure to climate change-related media content can be context dependent. Therefore, the moderating effect of age might be observable in different contexts where the negative association is also observable.

Furthermore, it is important to reflect on the study's limitations. As outlined in the data and methods section, the data sample and model have some limitations. The possible shortcomings of the OLS multiple linear regression model were considered during the data analysis. To ensure the robustness of the results, two alternative models –binary and ordinal logit regressions– were employed. The results for Hypotheses 2 and 3 proved robust and consistent across all models. However, the coefficient of the independent variable was statistically significant in the binary logit regression, indicating that the results for Hypothesis 1 are not robust. Given these inconsistencies, it is crucial to explore the relationship between 'relative consumption of non-traditional over traditional media' and concern for climate change further in future research.

Ideally this relationship could be further explored with better data as there are also some shortcomings in the data sample itself. The data set merged ESS10 and CRONOS-2 Wave 6 data, one of the few available surveys that cover both climate change attitudes and traditional and non-traditional media use. However, the CRONOS-2 data made some exclusions based on internet access, which could have introduced some biases and limitations. Therefore, re-analysing this research with better or more comprehensive data is recommended. A more representative sample that does not exclude participants based on household internet access could reduce the potential biases. Furthermore, more comprehensive data would include more measures of traditional and non-traditional media use as well as specific time allocations of types of media. These would allow for alternative operationalisation of the independent variable.

A promising avenue for future research is to explore the role of media landscapes. Media landscapes refer to the overall environment in which different types of media operate and interact. Since the media environment is affected by the politics, society and the economy that characterise the specific region or country (Al-Sofyani, 2023), it could be argued that media landscapes could affect how traditional and non-traditional media use can influence political attitudes. Wilson, Parker and Feinberg (2020) highlight that the media landscapes are changing, and in particular due to the proliferation of media, content is moving away from neutrality and inoffensiveness, which is increasing polarization in the US. They argue that, in a high-choice media environment, to attract users, media outlets need to stand out amongst a sea of options. As a result, they are moving towards an 'outrage industry' to catch readers' or users' attention (Wilson et al., 2020). Media outlets in an outrage industry are moving towards more selective reporting style and are prioritising sensationalism or entertainment rather than factual and neutral news (Wilson et al., 2020). These characteristics are often associated with non-traditional media. Consequently, in such a context, it is plausible that the association proposed in Hypothesis 1 would be weaker.

Additionally, since media landscapes are influenced by the country's politics, society and economy, it seems reasonable to expect that they might be affected by whether media outlets are private or state-owned (Al-Sofyani, 2023). This expectation could add another layer to the media 'outrage industry' theory (Wilson et al., 2020). I theorise that private owned media outlets, driven by profit motives, are more likely to participate in this outrage industry, in order to attract viewers or sell subscriptions, newspapers or magazines. Therefore, it is suspected that in contexts in which media outlets are predominantly privately owned, there may be less difference between non-traditional and traditional media, weakening the association suggested in Hypothesis 1.

Furthermore, one could also make the argument that since climate change is such a known, current and talked about issue and especially since most scientists worldwide have agreed on the urgency of climate change (United Nations, 2024), it is less likely that there will be a significant difference in the climate change-related content on traditional and non-

traditional media platforms. In contrast, issues lacking such a strong scientific consensus might see more differences in media coverage on non-traditional and traditional media platforms. I suspect that political attitudes about an issue without such a strong scientific consensus are more likely to be affected by stronger reliance on non-traditional over traditional media.

Therefore, I would argue that further research should explore the relationship between traditional and non-traditional media use and political attitudes about an issue without a strong scientific consensus. A specific example could be examining the association between relying more strongly on non-traditional than traditional media and attitudes regarding the current Ukraine Russia war in different contexts. This is an extremely relevant and interesting case, especially when considering that the media in Russia is currently subjected to extreme censure about the war (Luchenko, 2024).

In conclusion, this study found no robust evidence to support the hypothesis that there is an association between relying more strongly on non-traditional than traditional media and concern for climate change. Additionally, the results indicated that the socio-demographic factors age and education do not moderate this relationship. In light of these results, the role of trust in media sources, total media use and insights from a content analysis were discussed. Future research could explore these further along with the role of media landscapes. To address this study's limitations, future research should incorporate more comprehensive data. Including a detailed content analysis of media coverage along with an examination of the media landscapes for the specific context will be essential for a thorough examination of the relationship and the role of education level and age as moderators. These enhancements will enable future research to more thoroughly investigate and refine our understanding of the association between media use and concern for climate change or other political attitudes.

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## Appendix

### Appendix I: Tables

**TABLE 6:** Extra information OLS regression estimates for climate change concern (TABLE 2)

| Variables  | Coefficient | P-value | Confidence interval (95%) |
|--|-------------|---------|---------------------------|
| <b>Model 1</b>   |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNTtoTM) | -0.039      | 0.165   | -0.095 — 0.016            |
| <b>Model 2</b>   |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNTtoTM) | -0.026      | 0.776   | -0.202 — 0.151            |
| Low education* RCoNTtoTM (ref.)                                    | -           | -       | -                         |
| Medium education* RCoNTtoTM  | 0.023       | 0.817   | -0.174 — 0.220            |
| High education* RCoNTtoTM  | -0.034      | 0.724   | -0.224 — 0.156            |
| <b>Model 3</b>   |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNTtoTM) | 0.014       | 0.877   | -0.159 — 0.187            |
| Age* RCoNTtoTM   | -0.001      | 0.540   | -0.005 — 0.002            |

**TABLE 7:** Extra information binary logit estimates for climate change concern (TABLE 3)

| Variables  | Coefficient | P-value | Confidence interval (95%) |
|--|-------------|---------|---------------------------|
| <b>Model 1</b>   |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNTtoTM) | 0.797       | 0.038   | 0.643 — 0.987             |
| <b>Model 2</b>   |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNTtoTM) | 0.727       | 0.182   | 0.455 — 1.161             |
| Low education* RCoNTtoTM (ref.)                                    | -           | -       | -                         |
| Medium education* RCoNTtoTM  | 1.160       | 0.634   | 0.630 — 2.138             |
| High education* RCoNTtoTM  | 1.089       | 0.760   | 0.631 — 1.877             |
| <b>Model 3</b>   |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNTtoTM) | 0.514       | 0.069   | 0.251 — 1.053             |
| Age* RCoNTtoTM   | 1.007       | 0.204   | 0.995 — 1.022             |

**TABLE 8:** Extra information ordinal logit estimates for climate change concern (TABLE 4)

| Variables   | Coefficient | P-value | Confidence interval (95%) |
|---|-------------|---------|---------------------------|
| <b>Model 1</b>  |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNToTM) | -0.088      | 0.151   | -0.208 — 0.032            |
| <b>Model 2</b>  |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNToTM) | -0.036      | 0.848   | -0.400 — 0.329            |
| Low education* RCoNToTM (ref.)                                    | -           | -       | -                         |
| Medium education* RCoNToTM  | 0.020       | 0.924   | -0.396 — 0.437            |
| High education* RCoNToTM  | -0.097      | 0.631   | -0.493 — 0.299            |
| <b>Model 3</b>  |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNToTM) | 0.101       | 0.607   | -0.283 — 0.485            |
| Age* RCoNToTM   | -0.004      | 0.317   | -0.011 — 0.004            |

**TABLE 9:** Extra information two interactions modelled simultaneously (TABLE 5)

| Variables   | Coefficient | P-value | Confidence interval (95%) |
|---|-------------|---------|---------------------------|
| <b>Model 1: OLS regression</b>                                    |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNToTM) | 0.028       | 0.824   | -0.221— 0.278             |
| Low education* RCoNToTM (ref.)                                    | -           | -       | -                         |
| Medium education* RCoNToTM  | 0.018       | 0.858   | -0.181 — 0.217            |
| High education* RCoNToTM  | -0.037      | 0.704   | -0.230 — 0.155            |
| Age* RCoNToTM   | -0.001      | 0.561   | -0.004 — 0.002            |
| <b>Model 2: binary logit regression</b>                           |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNToTM) | 0.467       | 0.066   | 0.207 — 1.053             |
| Low education* RCoNToTM (ref.)                                    | -           | -       | -                         |
| Medium education* RCoNToTM  | 1.168       | 0.597   | 0.656 — 2.080             |
| High education* RCoNToTM  | 1.090       | 0.736   | 0.660 — 1.801             |
| Age* RCoNToTM   | 1.009       | 0.196   | 0.996 — 1.022             |
| <b>Model 3: Ordinal logit regression</b>                          |             |         |                           |
| Relative use of non-traditional over traditional media (RCoNToTM) | 0.169       | 0.565   | -0.407 — 0.746            |
| Low education* RCoNToTM (ref.)                                    | -           | -       | -                         |
| Medium education* RCoNToTM  | 0.001       | 0.996   | -0.439 — 0.441            |
| High education* RCoNToTM  | -0.112      | 0.604   | -0.536 — 0.312            |
| Age* RCoNToTM   | -0.004      | 0.318   | -0.011 — 0.004            |



## Appendix II: Checklist Ethical and Privacy Aspects of Research



### INSTRUCTION

This checklist should be completed for every research study that is conducted at the Department of Public Administration and Sociology (DPAS). This checklist should be completed *before* commencing with data collection or approaching participants. Students can complete this checklist with help of their supervisor.

This checklist is a mandatory part of the empirical master's thesis and has to be uploaded along with the research proposal.

The guideline for ethical aspects of research of the Dutch Sociological Association (NSV) can be found on their website ([http://www.nsv-sociologie.nl/?page\\_id=17](http://www.nsv-sociologie.nl/?page_id=17)). If you have doubts about ethical or privacy aspects of your research study, discuss and resolve the matter with your EUR supervisor. If needed and if advised to do so by your supervisor, you can also consult Dr. Bonnie French, coordinator of the Sociology Master's Thesis program.

### PART I: GENERAL INFORMATION

Project title: Master thesis sociology – politics and society: Media Consumption Patterns and Climate Change Concern in Belgium

Name, email of student: 705516cd@eur.nl

Name, email of supervisor: dekoester@essb.eur.nl

Start date and duration: 12/02/2024 – 23/06/2024

Is the research study conducted within DPAS YES - NO

If 'NO': at or for what institute or organization will the study be conducted?  
(e.g., internship organization)

## PART II: HUMAN SUBJECTS

1. Does your research involve human participants. YES - **NO**

*If 'NO': skip to part V.*

If 'YES': does the study involve medical or physical research? YES - NO

*Research that falls under the Medical Research Involving Human Subjects Act ([WMO](#)) must first be submitted to [an accredited medical research ethics committee](#) or the Central Committee on Research Involving Human Subjects ([CCMO](#)).*

2. Does your research involve field observations without manipulations that will not involve identification of participants. YES - NO

*If 'YES': skip to part IV.*

3. Research involving completely anonymous data files (secondary data that has been anonymized by someone else). YES - NO

*If 'YES': skip to part IV.*

### PART III: PARTICIPANTS

1. Will information about the nature of the study and about what participants can expect during the study be withheld from them? YES - NO
2. Will any of the participants not be asked for verbal or written 'informed consent,' whereby they agree to participate in the study? YES - NO
3. Will information about the possibility to discontinue the participation at any time be withheld from participants? YES – NO
4. Will the study involve actively deceiving the participants?  
*Note: almost all research studies involve some kind of deception of participants. Try to think about what types of deception are ethical or non-ethical (e.g. purpose of the study is not told, coercion is exerted on participants, giving participants the feeling that they harm other people by making certain decisions, etc.).* YES - NO
5. Does the study involve the risk of causing psychological stress or negative emotions beyond those normally encountered by participants? YES - NO
6. Will information be collected about special categories of data, as defined by the GDPR (e.g. racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership, genetic data, biometric data for the purpose of uniquely identifying a person, data concerning mental or physical health, data concerning a person's sex life or sexual orientation)? YES - NO
7. Will the study involve the participation of minors (<18 years old) or other groups that cannot give consent? YES - NO
8. Is the health and/or safety of participants at risk during the study? YES - NO
9. Can participants be identified by the study results or can the confidentiality of the participants' identity not be ensured? YES - NO
10. Are there any other possible ethical issues with regard to this study? YES - NO

If you have answered 'YES' to any of the previous questions, please indicate below why this issue is unavoidable in this study.

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What safeguards are taken to relieve possible adverse consequences of these issues (e.g., informing participants about the study afterwards, extra safety regulations, etc.).

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Are there any unintended circumstances in the study that can cause harm or have negative (emotional) consequences to the participants? Indicate what possible circumstances this could be.

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Please attach your informed consent form in Appendix I, if applicable.

Continue to part IV.

#### **PART IV: SAMPLE**

Where will you collect or obtain your data?

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*Note: indicate for separate data sources.*

What is the (anticipated) size of your sample?

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*Note: indicate for separate data sources.*

What is the size of the population from which you will sample?

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*Note: indicate for separate data sources.*

Continue to part V.

## **PART V: DATA STORAGE AND BACKUP**

Where and when will you store your data in the short term, after acquisition?

- I will store the digital data files on my computer and on a personal hard drive

*Note: indicate for separate data sources, for instance for paper-and pencil test data, and for digital data files.*

Who is responsible for the immediate day-to-day management, storage and backup of the data arising from your research?

- *I am personally responsible for the day-to-day management, storage and backup of the data arising from my research.*

How (frequently) will you back-up your research data for short-term data security?

- *Minimally, On a weekly basis*

In case of collecting personal data how will you anonymize the data?

- *I will not be collecting data myself. Specifically, I am using existing data from the European Social Survey (ESS) and the ESS data are already anonymized.*

*Note: It is advisable to keep directly identifying personal details separated from the rest of the data. Personal details are then replaced by a key/ code. Only the code is part of the database with data and the list of respondents/research subjects is kept separate.*

## PART VI: SIGNATURE

Please note that it is your responsibility to follow the ethical guidelines in the conduct of your study. This includes providing information to participants about the study and ensuring confidentiality in storage and use of personal data. Treat participants respectfully, be on time at appointments, call participants when they have signed up for your study and fulfil promises made to participants.

Furthermore, it is your responsibility that data are authentic, of high quality and properly stored. The principle is always that the supervisor (or strictly speaking the Erasmus University Rotterdam) remains owner of the data, and that the student should therefore hand over all data to the supervisor.

Hereby I declare that the study will be conducted in accordance with the ethical guidelines of the Department of Public Administration and Sociology at Erasmus University Rotterdam. I have answered the questions truthfully.

Name student: Cato Desmyter

Name (EUR) supervisor: Willem de Koster

Date: 19/03/2024

Date: 19/03/2024

