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Navigating the News

Analyzing AI Risks according to Dutch Journalists Preceding the European AI Act of 2024

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Table of Content

1. Design Plan

This study examines the portrayal of artificial intelligence (AI) risks in six Dutch newspapers over the period 2014-2024, in light of the European Union's Artificial Intelligence Act of 2024 (*The Act Texts | EU Artificial Intelligence Act*, 2024). The primary research question focuses on the risks and dangers of AI as described by journalists through an Exploratory Data Analysis (EDA) (Páez & Boisjoly, 2022). To this end, four broadsheet newspapers (*het Financieele Dagblad, NRC, de Volkskrant, and Trouw*) and two tabloid newspapers (*Algemeen Dagblad and De Telegraaf*) were selected (Boukes & Vliegenthart, 2017). The analysis centers on the AI risks outlined in journalistic articles, using the four risk levels defined by the AI Act: minimal (1), limited (2), high (3), and unacceptable (4) (*The Act Texts | EU Artificial Intelligence Act*, 2024). This preregistration portrays a proposed design, sampling method, variables, and analysis plan that attempt to be in accordance with the robust and transparent guidelines, ensuring methodological rigor and contributing to the advancement of knowledge in the field of communication science.

1.1 Main Research Question

"To what extent does the regulatory framework established by the AI Act align with the portrayal of AI risks in journalism, and what factors (time, news outlet and topic) influence the coverage of risk?"

1.2 Research Questions

RQ1: What topics are predominantly portrayed in the news by journalists with regard to artificial intelligence?

RQ2: What factors (time, topics and news outlets) affect how journalists portray risks in their reporting on artificial intelligence?

RQ3: To what extent does the risk portrayed by journalists and the regulatory framework of the AI Act differ from one another?

1.3 Type of Study

The research methodology adopted for this study entails a mixed-method approach with an exploratory orientation, aiming to comprehensively investigate the portrayal of artificial intelligence (AI). By blending both quantitative and qualitative research methods, this approach enables a multifaceted examination of AI representation (Hase et al., 2020). This mixed method approach is chosen, since the application of computational methods to study AI narratives grants the ability to analyze large texts and uncover patterns and nuances often missed without implementing digital tools (Recchia 2020) . Automated content analysis, facilitated by BERTopic computational tools and algorithms, allows for efficient processing and categorization of large datasets, such as news articles (Grootendorst, 2022). On the other hand, manual content analysis involves human coders ($n = 2$) systematically analyzing textual content to identify topics, patterns, and nuances to assess whether the AI Act is a representable framework for determining risks created by artificial intelligence.

1.4 Sampling Plan

Given that the AI Act was implemented to regulate the use of artificial intelligence in Europe (The Act Texts | EU Artificial Intelligence Act, 2024), a sample of the Dutch national newspapers are considered. These newspapers, known for their focus on both national and international news, provide a cosmopolitan outlook (Vergeer, 2020). This broader perspective is essential for AI-related news, which often involves global developments, international collaborations, and widespread implications. National outlets are more likely to cover significant AI advancements, regulatory changes, and international AI trends that can influence public opinion and policy. A G * Power test is to be considered arbitrary, since 1,000 articles shall be examined. This sample size is determined by previous studies that conducted a similar methodology (Cools et al., 2024; Vergeer, 2020; Hase et al., 2020).

1.5 Data Collection

Although web scraping itself is not inherently illegal, scraping copyrighted content like images, videos, or articles without permission is illegal, emphasizing the importance of respecting copyright restrictions when scraping news articles (Hobby, 2024). Therefore, Nexis Uni is used to access a data repository containing Dutch news articles that adhere to the guidelines set by good research practices and ethical standards while also offering a broad array of news sources (Bowman et al., 2022; Nexis Uni® Home, n.d.). Unfortunately, Nexis uses a tokenizer for accessing the transcripts of the articles. To avoid time constraints, geckodriver shall be used in order to scrape each article that has been retrieved from Nexis Uni (*Selenium*, 2022).

By using the queries "kunstmatige intelligentie" and "AI", a total of 6,450 articles about AI from the six selected newspapers were collected (Vergeer, 2020). The period from March 31, 2014, to March 31, 2024, was considered to provide longitudinal data from the past ten years up to the publication of the AI Act (*The Act Texts | EU Artificial Intelligence Act*, 2024). From this pool, a select sample of 1,000 articles was drawn from the 10 topics (n = 100) for manual content analysis, allowing for close reading and in-depth understanding of the articles and topics (Hase et al., 2020; Vergeer, 2020). By combining the AI Act and codebooks from previous academic research (Deng & Matthes, 2023; Kaplan & Garrick, 1981), a codebook is created to organize the data from the AI Act and risk described in articles by journalists.

3. Variables

This section consists of the independent and dependent variables that were used for statistical analyses of this thesis study.

3.2. Dependent Variable

Difference Score

The difference score between the AI Act and the described risk by the journalist (Rogosa & Willett, 1983). In this case, the lower the score, the higher the risk difference from journalists. For instance, a journalist determines a risk to be level 4 (unacceptable) and the AI Act as level 1 (minimal), which leads to a difference score of -3 after subtracting from each other. The lowest score -3 is the highest difference between risk level according to journalist and AI Act. When the difference score is 0, it indicates that there is no difference between how journalists and the AI Act recognize a risk. In order to compare these two scores and creating the difference score, risk presence is merged with minimal risk, which makes it possible to subtract the AI Act score (0 minimal, 1, limited, 2 high, 3 unacceptable) by the journalistic risk score (0 minimal, 1, limited, 2 high, 3 unacceptable).

Type: Interval

Method: N/A

Representation: -3, -2, -1, 0, 1, 2, 3

Risk Presence

The journalist portrays a clear risk that is a result from the use of artificial intelligence.

Type: Binary (0 - no, 1 - yes)

Method: Manual content analysis

Representation: 0, 1

Risk Level 1 (Minimal)

The article describes the risk to be nuanced due to benefits with no significant threats or fears. There are risks, but they are not entirely due to the emergence of artificial intelligence. The risk is compared with the benefits to a degree that they are equal or debunked.

Type: Binary (0 - no, 1 - yes)

Method: manual content analysis

Representation: 0, 1

Risk Level 2 (Limited)

The article presents the risk as manageable due to regulation. This also highlights the potential for positive aspects of implementation of AI.

Type: Binary (0 - no, 1 - yes)

Method: Manual content analysis

Representation: 0, 1

Risk Level 3 (High)

The article describes the risk as a significant threat to human society. However, it also attempts to argue that the risk has potential to be regulated and the risk can be partially solved.

Type: Binary (0 - no, 1 - yes)

Method: Manual content analysis

Representation: 0, 1

Risk Level 4 (Unacceptable)

Humanity is threatened by the emergence of artificial intelligence and there is no solution for this doom scenario, since it is not solved or regulated to this date. According to the journalist, action should be taken in some cases.

Type: Binary (0 - no, 1 - yes)

Method: Manual content analysis

Representation: 0, 1

3.3. Independent Variable

AI Act 1 (Minimal)

Risks where AI systems are those that pose low or negligible risks to users and can be deployed with minimal regulatory oversight, such as spam filters and AI used in games (NPC).

Type: Binary (0 - no, 1 - yes)

Method: Manual content analysis

Representation: 0, 1

AI Act 2 (Limited)

AI systems that present moderate risks and are subject to certain transparency obligations to ensure users are informed about their operations, such as chatbots and recommendation systems.

Type: Binary (0 - no, 1 - yes)

Method: manual content analysis

Representation: 0, 1

AI Act 3 (High)

AI systems pose significant risks to health, safety, or fundamental rights, but these can be managed with specific regulatory requirements.

Type: Binary (0 - no, 1 - yes)

Method: manual content analysis

Representation: 0, 1

AI Act 4 (Unacceptable)

Risks that pose a threat to the safety, rights and values to the certain extent that it is not able to be regulated and is therefore prohibited, such as social scoring and real-time biometric identification for law enforcement.

Type: Binary (0 - no, 1 - yes)

Method: manual content analysis

Representation: 0, 1

Topics

Clusters of words that frequently appear together in a set of documents, representing themes or subjects within the text.

Type: Binary (Dummy variable)

Method: BERTopic

Representation: 0 - X (still to be determined based on exploration of the content)

Date

The corresponding year an article has been published.

Type: Continuous

Method: N/A

Representation: dd-mm-yyyy

News Outlet

The newspaper that corresponds to where the article has been published. A distinction is made between broadsheets and tabloids (Boukes & Vliegenthart, 2017; Alba-Juez, 2017).

Type: Categorical

Method: N/A

Representation: *het Financieele Dagblad, NRC, de Volkskrant, Trouw*, *Algemeen Dagblad and De Telegraaf*

Tabloid

In this case, a difference is made to determine a tabloid to be able to statistically analyze the type of news outlet (*Algemeen Dagblad* and *De Telegraaf*) (Boukes & Vliegenthart, 2017; Alba-Juez, 2017).

Type: Binary

Method: N/A

Representation: 0, 1

Broadsheet

A broadsheet is determined and separated from the tabloid to statistically analyze the type of news outlet (*het Financieele Dagblad, NRC, de Volkskrant, Trouw*) (Boukes & Vliegenthart, 2017; Alba-Juez, 2017).

Type: Binary

Method: N/A

Representation: 0, 1

4. Analysis Plan

In this section the analysis plan is elaborated on how the data is examined, what statistical analyses are implemented and the examination criteria.

4.1. Topic Modeling (BERTopic)

In academia there have been various procedures used to explore and examine the topics (Cools et al., 2022; Nguyen, 2023; Ouchchy et al., 2020). While these studies implemented LDA for topic modeling, this study shall implement BERTopic, since LDA fails to grasp patterns and nuances of artificial intelligence being portrayed in the news (Wang et al., 2023). Besides granting a birds-eye-view of how artificial intelligence is portrayed in the Dutch media, these clustered topics shall also be used for manual content analysis purposes.

4.2. Manual Content Analysis

To structure the articles, automated topic modeling was applied to identify topics within the 6,450 articles, initially resulting in a broad range of topics that grants an encompassing display of how artificial intelligence is being presented. These topics were then clustered into a manageable number of 10 topics by inductive close reading and machine learning methods. After the codebook has been finalized and the intercoder reliability test has been made, the manual content analysis is executed by reading each of the 1,000 sampled articles (100 for each topic) was conducted, and a risk label was assigned. Each coder examined 500 articles. The unit of analysis consists of the Dutch articles in their entirety, since it allows for a complete picture of how journalists portray artificial intelligence as well as to determine how risks are portrayed (Chia, 2019; Riffe et al., 2019). When the coding was completed, the data was analyzed by implementing statistical tests that correspond to the research questions (Creswell & Creswell, 2017; Titscher et al., 2000). The following tests shall be conducted:

Bivariate logistic regression:

To provide a detailed view of the factors (AI Act, time, topics and news outlets) influence on the presence of risk in the articles from a journalistic point of view.

Ordinal regression:

To provide insights into which factors (AI Act, time, topics, and news outlets) influence how the risk level is determined by journalists.

Chi-square test:

To portray whether the AI risks in the sampled articles significantly varies or aligns between the AI Act and journalism.

Ordinary Least Squares regression analysis (OLS):

To determine the variation in risk allocation between the AI Act and journalists and what factors (AI Act, time, topics and news outlets) affect this difference score.

4.3. Evaluation Criteria

P-values: results holding a significant P value ($P < 0.05$).

Multicollinearity: values below 0.1 or VIF values above 10 indicate multicollinearity issues.

Normality: shall be examined through a P-P Plot of Regression Standardized Residual.

Homoscedasticity: shall be examined whether the residuals (errors) in a regression model have constant variance across different levels of the independent variables.

Regression coefficient (B): determines whether a positive or negative relation is presented in the OLS.

Somers' D or Gamma: the assessment of the association between two rankings (AI Act and Risk), with values close to 1 indicating strong agreement and values close to -1 indicating strong

disagreement. This is used in the chi-square test to assess the relationship between the AI Act and risks described by journalists.

Hosmer and Lemeshow Test: This test assesses the goodness of fit for the logistic regression model, where a non-significant p-value indicates a good fit of the model to the data.

Omnibus Tests of Model Coefficients: In the case of a significant Chi-square statistic ($p < 0.001$), it indicates that the model with predictors is significantly better than the null model.

Intercoder reliability test: To determine the intercoder reliability of the two coders, a Krippendorff Alpha is used on a sample of 120 that contains 20 articles of each news outlet. Since there will be coded with ordinal data for content analysis, a Krippendorf Alpha was performed (Hayes & Krippendorff, 2007):

Alpha ≥ 0.800: substantial agreement

Alpha between 0.667 and 0.800: moderate agreement

Alpha between 0.500 and 0.667: adequate agreement

Alpha < 0.500: poor agreement

If the intercoder reliability score is < 0.500, strategies shall be applied to improve the validity and reliability, such as: member checks, peer debriefing, thick description and memo writing.

Alternative Models and Variables: In the case that the results do not pass these evaluation criteria, alternative models shall be considered, such as ANOVA and T-tests, or shall be addressed in the limitations. Besides other models, variables may change over the course of the research process, due to manipulation or exploratory alterations in the research design.

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