

Tracking Autism Stigma in Italian Newspapers: A Longitudinal Analysis of Media Discourse (2016–2025)

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Abstract

Public awareness of Autism Spectrum Disorder (ASD) has grown in recent years, yet stigma surrounding this condition persists. Building on prior research showing increasingly positive portrayals of ASD, this study examines recent longitudinal trends in stigma and ASD, with a focus on Italian newspapers, and how these were affected by a key event such as the COVID-19 pandemic. We analyzed nearly 3,000 articles published between 2016 and 2025 using an innovative multi-layered Natural Language Processing (NLP) framework to capture multiple dimensions of stigma, including discriminatory language, emotional framings indicative of prejudices, stereotypes, and the thematic contexts in which ASD-related stigma appears. Overall, results indicate low levels of overt stigma and a gradual shift toward more positive portrayals, with only temporary disruptions during the pandemic. Some stereotypes remain, highlighting the need for ongoing attention to ASD representation in the media.

1 Introduction

Autism Spectrum Disorder (ASD)¹ is a neurodevelopmental condition characterized by substantial heterogeneity in behavioral manifestations and support needs (Scattoni et al., 2023). Despite increased public awareness and improved diagnostic practices (Solmi et al., 2022), autistic individuals continue to experience stigma in everyday life.

Following Fox et al. (2018), stigma operates through three key interrelated mechanisms: stereotypes, which involve oversimplified beliefs; prej-

udices, referring to the emotional reactions these beliefs elicit; and discrimination, encompassing unjust or unfair treatment. In the case of ASD-related stigma, this dynamic is further complicated because ASD occupies a distinctive position at the intersection of what Goffman (1963) described as "discredited" (i.e., visible and readily apparent to others) and "discreditable" (i.e., invisible and that can be hidden from others) identities, since it can, in some cases, be concealable (Han et al., 2021). Consequently, autistic individuals may be exposed to the dual burden of managing concealment to avoid stigma while also being subjected to it.

Media narratives play a key role in shaping public understanding of ASD, either reinforcing or challenging stereotypical and prejudicial portrayals (Mittmann et al., 2024). At the same time, media discourse offers a lens through which it is possible to observe how stigma evolves. A narrative review of publications from 2010 to 2023 reported a steady increase in newspaper coverage of ASD, reflecting the rising prevalence of the condition (Solmi et al., 2022), with stigma cues declining over time yet still present in one-third of articles (Karaminis et al., 2023; Yu and Farrell, 2020).

In light of these changes in international media coverage, the present study investigates ASD-related stigma from a longitudinal perspective in Italian newspapers. To this end, we applied an innovative multi-layered Natural Language Processing (NLP) approach to a decade of Italian news articles containing ASD-related keywords. By combining several stigma-detection techniques, we assessed quantitatively whether and how stigma shifted over time, including the COVID-19 pandemic, a major societal event that reshaped public perceptions of mental health and affected the well-being of autis-

¹We follow the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (Association, 2013) and use the terms *Autism Spectrum Disorder*, *autism*, and *autistic* while recognizing that some prefer the terms *condition* and *neurodivergence*.

tic individuals (Penninx et al., 2022; Scheeren et al., 2023; Azizifard et al., 2024).

Building on previous research (Karaminis et al., 2023), we expect an overall trend towards more positive portrayals of ASD, with a temporary slowdown during the COVID-19 period, as observed for other mental health and neurodevelopmental conditions (Low et al., 2020).

2 Methods

2.1 Dataset

A dataset of 2,854 newspaper articles was collected from 18 Italian newspapers through the Nexis Uni database.² Articles were retrieved by selecting all items containing ASD-related keywords (i.e., *autistic**, *autism**, *Asperger*). Three time frames were considered: the year four years before COVID-19 (T1; 9 Mar 2016–9 Mar 2017), the first pandemic year (T2; 9 Mar 2020–9 Mar 2021), and the year four years after (T3; 9 Mar 2024–9 Mar 2025). Articles had an average length of 332.4 words and varied in focus, with some addressing ASD only tangentially.

2.2 Rationale and Models

We employed a multi-layered NLP framework integrating hate speech detection, emotion analysis, stereotype analysis, and topic modeling to capture the multidimensional nature of stigma, as conceptualized by Fox et al. (2018).³ This pipeline addresses the three core mechanisms of stigma, namely discriminatory language, prejudices, and stereotypical beliefs, while also considering the contexts in which these mechanisms are most frequently expressed.

Specifically, (1) to measure discrimination expressed through unfair and offensive language, we used a multilingual hate speech detection model,⁴ which estimated probability scores (range 0-1) in seven categories: toxicity, severe toxicity, obscene, threat, insult, identity attack, sexual explicit. The analysis was conducted at the sentence level, considering only sentences containing at least one

²<https://www.lexisnexis.com>

³All the tools employed in this study were trained and fine-tuned on data retrieved from Wikipedia, web-crawling initiatives, and social media. As our corpus consists of mainstream newspaper articles intended for a non-specialist audience rather than a highly technical one, the models were used in their pre-trained version, as provided by the publishers, without additional fine-tuning.

⁴<https://huggingface.co/unitary/toxic-bert> (Hanu and Unitary team, 2020)

ASD-related keyword.

(2) To assess affective framings indicative of prejudicial attitudes, we performed emotion analysis using an Italian BERT-based model⁵ at the paragraph level, grouping consecutive sentences to capture broader contextual meaning. Each paragraph was assigned a probability score (range 0–1) for six emotions: fear, anger, joy, sadness, surprise, and love. This analysis aimed to measure the overall affective framing of articles as a proxy for the emotional context in which ASD is discussed, which may contribute to the emergence or reinforcement of prejudicial attitudes toward autistic people.

(3) ASD-related stereotypes were detected using a multilingual Natural Language Inference model,⁶ adapting the approach proposed by Liu et al. (2024). For each paragraph, we computed the probability of entailment (range 0-1) between the text and seven common myths about ASD, as identified in a focus group study by John et al. (2018). These myths include: i) autistic individuals are not interested in social relationships; ii) dislike being touched; iii) are introverted; iv) cannot perceive social rejection; v) possess special talents or savant skills; vi) are dangerous; vii) are mad.

(4) Leveraging the BERTopic framework,⁷ we performed a sentence-level topic modeling analysis to map the contexts in which ASD is discussed and where related stigma tends to occur, with sentence-level granularity enabling the detection of secondary themes. The procedure initially generated 74 topics, of which 58 were judged interpretable by a human evaluator and assigned labels, and some subsequently manually merged. Of the remaining 36 topics, only those reaching an average article-level prevalence of 0.5% in at least one time frame were retained, yielding a final set of 23 topics.

To assess changes across the three time frames, given the non-normal distributions of the variables, we performed Kruskal–Wallis tests followed by Dunn’s post-hoc tests. Spearman correlations between topics and other variables were also computed to identify the contexts most strongly associated with stigma, while simultaneously providing

⁵<https://huggingface.co/MelmaGrigia/bert-base-italian-xxl-uncased-italian-finetuned-emotions>

⁶<https://huggingface.co/MoritzLaurer/mDeBERTa-v3-base-xnli-multilingual-nli-2mil7> (Laurer et al., 2024)

⁷<https://maartengr.github.io/BERTopic/> (Grootendorst, 2022)

an indirect check on the validity of the extracted measures by examining whether stigma dimensions co-occurred consistently across thematic contexts. All tests were adjusted for multiple comparisons using False Discovery Rate (FDR) correction (Benjamini and Hochberg, 1995). The analyses were implemented using the R package *rstatix* (Kassambara, 2023).

3 Results

Fig. 1a-1d present the results of hate speech detection, emotion analysis, stereotype detection, and topic modeling. Table 1 summarizes the results of the Kruskal–Wallis and Dunn’s post-hoc tests for these analyses, presenting for each variable the direction of changes between time frames. Only variables with Kruskal–Wallis $p < 0.05$ and $\epsilon^2 > 0.01$ are included; thus none of the hate speech variables are visible. Fig. 2 displays correlations between topics and all other variables. Full statistical details are reported in Appendix A (Tables 2-5).

Hate speech detection revealed overall very low levels of discriminatory language (Fig. 1a), with only 89 articles exceeding a score of 0.05 in any of the categories. The few instances of hate speech identified featured inappropriate or derogatory uses of terms related to ASD (e.g., "l'autismo e la stupidità delle amministrazioni pubbliche" [autism and the stupidity of public administrations]; "rissoso, antisemita, misogino, era affetto dalla sindrome di Asperger" [squabbling, anti-Semitic, misogynist, he was affected by the Asperger’s syndrome]). Given that most hate speech dimensions had near-zero prevalence, subsequent analyses focused specifically on toxicity and insult, neither of which showed meaningful changes.

Emotion analysis revealed a strong prevalence of joy and surprise (Fig. 1b), with anger present to a lesser extent. Table 1 shows a significant increase in anger during the COVID-19 period, which returned to baseline in T3. Similarly, joy declined during COVID-19 but returned to pre-pandemic levels afterwards. We also observed a steady increase in love and a decrease in sadness.

The stereotype analysis identified four particularly prominent stereotypes: being introverted, avoiding physical contact, possessing savant-like abilities, and failing to recognize social rejection (Fig. 1c). Over time (Table 1), the stereotypes of introversion and rejection blindness increased during COVID-19 but returned to baseline after-

ward. The stereotypes of madness and social disengagement steadily declined across all time frames. Dangerousness and touch avoidance did not peak during COVID-19 but decreased post-pandemic. Notably, the savant stereotype showed no significant changes over time.

Topic modeling revealed a mix of ASD-specific and general themes within the corpus (Fig. 1d). The topic ASD & SOCIAL INCLUSION was the most prominent across all articles and was therefore excluded from the visualizations, indicating that ASD is typically the central subject of the articles and that ASD-related keywords are generally used appropriately. Among ASD-specific topics, we observed an increase in awareness- and philanthropy-related themes from pre- to post-COVID, with a drop during the pandemic. Topics related to film, arts, and literature were also particularly prevalent, remaining stable or increasing post-COVID. As expected, topics associated with COVID-isolation measures peaked during the pandemic and returned to prior levels afterwards. Mentions of ASD in scientific contexts decreased during COVID but rose again post-COVID. In contrast, the topics VIOLENT NEWS CASES, LEGAL SYSTEM & Court and FAMILY DYNAMICS AND CRISES either decreased or remained stable pre-post pandemic.

The correlation analysis (Fig. 2) revealed systematic associations between stigma dimensions and topics, supporting the interpretability and validity of the measures extracted and indicating that certain narrative contexts are more likely to convey prejudicial and stereotypical portrayals. In particular, higher levels of several stereotypes and negative emotions were associated with articles that focused on violent or judicial cases involving autistic people, as well as adolescence, problematic family dynamics, school-related issues, and themes related to pandemic restrictions. In contrast, articles covering cinema, performing arts, and historical scientists tended to convey more positive emotions, but reinforced the savant stereotype. As expected, topics related to inclusion, awareness, and employment were negatively correlated with all stereotypes and positively correlated with positive emotions.

4 Discussion

In this study, we analyzed several components of ASD-related stigma in Italian newspapers over a ten-year period, including the COVID-19 pandemic. Our aim was to assess whether the generally

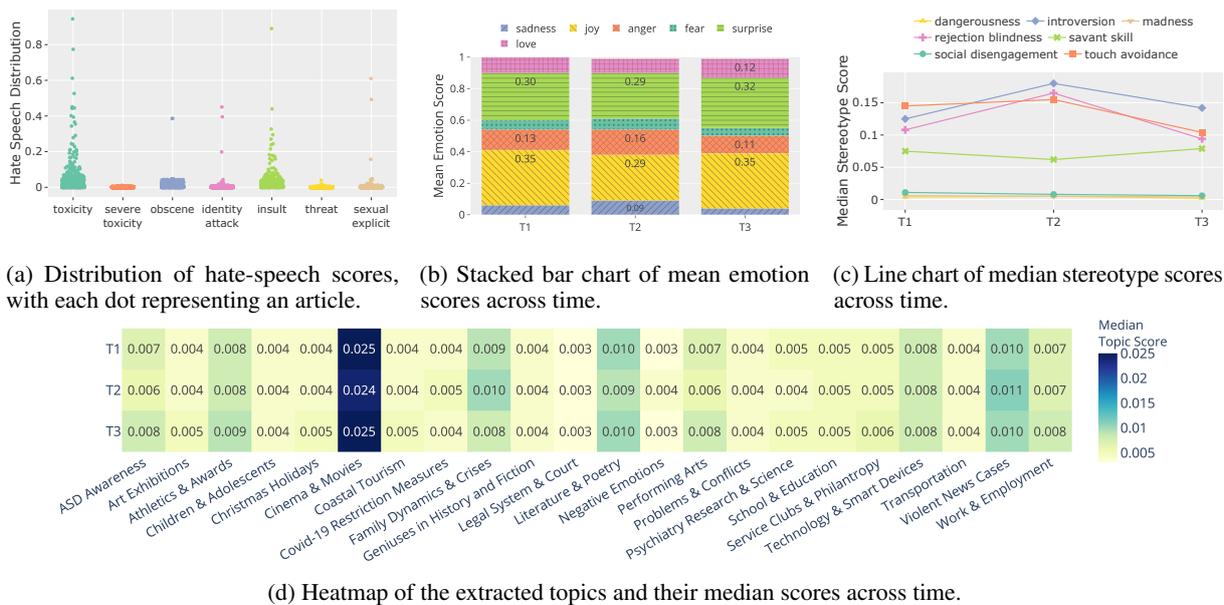


Figure 1: Output data from hate speech detection, emotion analysis, stereotype detection and topic modeling.

Emotions				Stereotypes			
Anger	↑↓ =	Joy	↓↑ =	Dangerousness	=↓ ↓	Introversion	↑↓ =
Love	↓↑ ↑	Sadness	↑↑ ↓	Madness	↓↓ ↓	Rejection Blindness	↑↓ =
				Social Disengagement	↓↓ ↓	Touch Avoidance	=↓ ↓
Topics							
Art Exhibitions		↓↑ ↑		ASD Awareness	↓↑ ↑	Athletics & Awards	↓↑ ↑
Children & Adolescents		↑↓ ↑		Christmas Holidays	↓↑ ↑	Coastal Tourism	=↑ ↑
Covid-19 Restriction Measures		↑↓ =		Family Dynamics & Crisis	↑↓ ↓	Legal System & Court	↑↓ ↓
Negative Emotions		↑↓ =		Performing Arts	↓↑ ↑	Problems & Conflicts	↑↓ =
Psychiatry Research & Science		↓↑ ↑		School & Education	↑↓ =	Service Clubs & Philanthropy	↓↑ ↑
Transportation		↑↓ =		Violent News Cases	↑↓ =	Work & Employment	↑↑ ↑

Table 1: Temporal changes from T1 to T2, T2 to T3, and T1 to T3 (after |) assessed using Kruskal–Wallis and Dunn’s post-hoc tests. ↑ indicates an increase, ↓ indicates a decrease, and = denotes a non-significant change.

improving trend toward more positive reporting on ASD, documented in previous literature (Karaminis et al., 2023), continued, and how the COVID-pandemic shaped public discourse. Specifically, we developed a novel multi-layered stigma detection framework to capture changes in the different components of ASD-related stigma, including discriminatory language (hate speech detection), prejudicial attitudes (emotion analysis), stereotypical beliefs (stereotype detection), and the contexts in which stigma most frequently occurs (topic modeling).

Overall, as hypothesized, our analyses revealed low levels of hate speech. Media coverage showed a predominantly positive emotional tone, especially joy and surprise, with only a brief worsening during the COVID-19 pandemic. This trend paralleled awareness-focused topics (e.g., ASD AWARENESS), which experienced a short pandemic-related dip but became increasingly prominent in the post-pandemic period. Stereotypical portrayals declined

or remained stable over time, alongside topics related to violence, judicial cases, and family crises, with a slight temporary increase during COVID-19. Violence-related topics were highly prevalent in the corpus, with autistic individuals being more often depicted as victims rather than as perpetrators, as suggested by the low prevalence of the dangerousness stereotype. This pattern aligns with evidence of increased risk of violence experienced by autistic people (Trundle et al., 2023) and may also reflect heightened media attention to violent events associated with the popularization of true crime narratives (Sherrill, 2020). The only prominent stereotype that remained unchanged even during the COVID-19 pandemic was the portrayal of autistic people as savants. While seemingly positive, this can place undue expectations on autistic individuals and function as a microaggression (Czopp et al., 2015). It appeared most often in discussions related to cinema, literature, and historical or fic-



Figure 2: Significant Spearman correlations, with $|\rho| > 0.1$, between topics and the other variables.

tional figures ("Rain Man effect"; Draaisma, 2009); these topics, after those about inclusion and awareness, were among the most common in the corpus.

To conclude, these findings indicate a progressive improvement in public discourse on ASD, in line with earlier studies. Our results also underscore the role of advocacy organizations and social inclusion models, which contribute to more inclusive and positive narratives. At the same time, the analyses show that critical events such as the COVID-19 pandemic can temporarily slow down or challenge these improvements, though in this case without producing lasting negative effects. Finally, the persistence of potentially harmful stereotypes and the prominence of violence-related news highlights the need for continued attention to the ways in which media representations may affect the well-being of autistic people.

5 Limitations

The corpus analyzed spans a ten-year period and includes approximately 3,000 articles. While it allows for a considerable examination of media discourse on ASD and reflects diverse editorial orientations, it is limited to traditional media, excluding social media. Another limitation concerns the error analysis of the extracted measures. A sample of approximately 5% of the dataset was qualitatively inspected by a single human evaluator, and correlations among the variables were examined to assess their validity and interpretability. However, no exhaustive manual annotation or formal error analysis was performed to quantitatively evaluate models' performance. In future work, a Large Language Model-assisted annotation approach, as implemented in recent studies (Bouzoubaa et al., 2026, 2024), could be adopted both improve re-

liability and to provide curated training data for fine-tuning stigma detection tools (Giorgi et al., 2024). Finally, the study did not directly involve autistic people, whose participation could have enriched the interpretation of the findings and helped better align the analytical framework with lived experience.

6 Ethical Considerations

This work leverages NLP tools to develop an adaptable, multi-layered analytical pipeline for the assessment of stigma in media corpora. The proposed pipeline, here applied to ASD-related stigma, is conceived to be transferable and to enable systematic and comparable measurement of stigma across different clinical conditions and media contexts. By operationalizing multiple dimensions of stigmatization in discourse, the approach aims to raise awareness of potentially stigmatizing framings, thereby promoting more responsible reporting practices and informing the design of de-stigmatizing educational materials.

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A Appendix

Tables 2–5 report the statistical details of the analyses used to assess ASD-related stigma in Italian media, including Kruskal–Wallis tests with Dunn’s post-hoc comparisons and Spearman correlations.

Variabile	Kruskal–Wallis	Dunn T1–T2	Dunn T2–T3	Dunn T1–T3
Sadness	$H(2) = 111.34, p < .001, \varepsilon^2 = .039$	$Z = -3.43, p < .001 (\uparrow)$	$Z = 10.25, p < .001 (\downarrow)$	$Z = 7.11, p < .001 (\downarrow)$
Joy	$H(2) = 43.08, p < .001, \varepsilon^2 = .015$	$Z = 5.05, p < .001 (\downarrow)$	$Z = -6.25, p < .001 (\uparrow)$	$Z = -1.26, p = .210 (=)$
Love	$H(2) = 60.07, p < .001, \varepsilon^2 = .021$	$Z = 2.09, p = .037 (\downarrow)$	$Z = -7.41, p < .001 (\uparrow)$	$Z = -5.55, p < .001 (\uparrow)$
Anger	$H(2) = 40.51, p < .001, \varepsilon^2 = .014$	$Z = -4.92, p < .001 (\uparrow)$	$Z = 6.06, p < .001 (\downarrow)$	$Z = 1.19, p = .235 (=)$
Fear	$H(2) = 28.84, p < .001, \varepsilon^2 = .01$	$Z = -5.28, p < .001 (\uparrow)$	$Z = 3.66, p < .001 (\downarrow)$	$Z = -1.69, p = .091 (=)$
Surprise	$H(2) = 15.14, p < .001, \varepsilon^2 = .005$	$Z = 1.01, p = .314 (=)$	$Z = -3.71, p < .001 (=)$	$Z = -2.81, p = .007 (=)$
Touch Avoidance	$H(2) = 53.31, p < .001, \varepsilon^2 = .019$	$Z = -0.02, p = .986 (=)$	$Z = 6.16, p < .001 (\downarrow)$	$Z = 6.40, p < .001 (\downarrow)$
Introversiion	$H(2) = 30.66, p < .001, \varepsilon^2 = .011$	$Z = -5.34, p < .001 (\uparrow)$	$Z = 4.13, p < .001 (\downarrow)$	$Z = -1.26, p = .207 (=)$
Rejection Blindness	$H(2) = 81.12, p < .001, \varepsilon^2 = .028$	$Z = -7.196, p < .001 (\uparrow)$	$Z = 8.44, p < .001 (\downarrow)$	$Z = 1.30, p = .195 (=)$
Savant Skill	$H(2) = 22.61, p < .001, \varepsilon^2 = .008$	$Z = 3.89, p < .001 (=)$	$Z = -4.40, p < .001 (=)$	$Z = -0.53, p = .599 (=)$
Dangerousness	$H(2) = 99.01, p < .001, \varepsilon^2 = .035$	$Z = -0.59, p = .557 (=)$	$Z = 8.68, p < .001 (\downarrow)$	$Z = 8.43, p < .001 (\downarrow)$
Madness	$H(2) = 51.68, p < .001, \varepsilon^2 = .018$	$Z = 3.49, p < .001 (\downarrow)$	$Z = 3.41, p < .001 (\downarrow)$	$Z = 7.19, p < .001 (\downarrow)$
Social Disengagement	$H(2) = 107.72, p < .001, \varepsilon^2 = .038$	$Z = 3.34, p < .001 (\downarrow)$	$Z = 6.48, p < .001 (\downarrow)$	$Z = 10.22, p < .001 (\downarrow)$
Toxicity	$H(2) = 24.73, p < .001, \varepsilon^2 = .009$	$Z = -4.35, p < .001 (=)$	$Z = 4.37, p < .001 (=)$	$Z = -1.04, p = .984 (=)$
Severe Toxicity	$H(2) = 15.06, p < .001, \varepsilon^2 = .005$	$Z = -1.93, p = .080 (=)$	$Z = -1.79, p = .073 (=)$	$Z = -3.88, p < .001 (=)$
Obscene	$H(2) = 9.43, p = .009, \varepsilon^2 = .003$	$Z = .18, p = .861 (=)$	$Z = -2.68, p = .022 (=)$	$Z = -2.61, p = .014 (=)$
Identity Attack	$H(2) = 17.55, p < .001, \varepsilon^2 = .006$	$Z = -3.96, p < .001 (=)$	$Z = .99, p = .319 (=)$	$Z = -3.09, p = .003 (=)$
Insult	$H(2) = 10.26, p = .006, \varepsilon^2 = .004$	$Z = 2.16, p = .005 (=)$	$Z = 2.16, p = .005 (=)$	$Z = 3.00, p = .008 (=)$
Threat	$H(2) = 20.71, p < .001, \varepsilon^2 = .007$	$Z = -4.37, p < .001 (=)$	$Z = 1.28, p = .202 (=)$	$Z = -3.22, p = .002 (=)$
Sexual Explicit	$H(2) = 19.09, p < .001, \varepsilon^2 = .007$	$Z = -4.24, p < .001 (=)$	$Z = 1.40, p = .162 (=)$	$Z = -2.96, p = .005 (=)$
ASD Awareness	$H(2) = 112.44, p < .001, \varepsilon^2 = .039$	$Z = 7.11, p < .001 (\downarrow)$	$Z = -10.46, p < .001 (\uparrow)$	$Z = -3.49, p < .001 (\uparrow)$
Art Exhibitions	$H(2) = 106.51, p < .001, \varepsilon^2 = .037$	$Z = 5.81, p < .001 (\downarrow)$	$Z = -10.32, p < .001 (\uparrow)$	$Z = -4.70, p < .001 (\uparrow)$
Athletics & Awards	$H(2) = 67.05, p < .001, \varepsilon^2 = .024$	$Z = 2.29, p = .022 (\downarrow)$	$Z = -7.86, p < .001 (\uparrow)$	$Z = -5.80, p < .001 (\uparrow)$
Children & Adolescents	$H(2) = 76.21, p < .001, \varepsilon^2 = .027$	$Z = -8.45, p < .001 (\uparrow)$	$Z = 6.41, p < .001 (\downarrow)$	$Z = -2.12, p = .034 (\uparrow)$
Christmas Holidays	$H(2) = 115.04, p < .001, \varepsilon^2 = .04$	$Z = 2.25, p = .024 (\downarrow)$	$Z = -10.05, p < .001 (\uparrow)$	$Z = -8.12, p < .001 (\uparrow)$
Cinema & Movies	$H(2) = 23.46, p < .001, \varepsilon^2 = .008$	$Z = 4.79, p < .001 (=)$	$Z = -3.17, p = .002 (=)$	$Z = 1.69, p = .091 (=)$
Coastal Tourism	$H(2) = 90.81, p < .001, \varepsilon^2 = .032$	$Z = 1.66, p = .096 (=)$	$Z = -8.80, p < .001 (\uparrow)$	$Z = -7.43, p < .001 (\uparrow)$
Covid-19 Restriction Measures	$H(2) = 107.72, p < .001, \varepsilon^2 = .038$	$Z = -9.82, p < .001 (\uparrow)$	$Z = 8.12, p < .001 (\downarrow)$	$Z = -1.78, p = .075 (=)$
Family Dynamics & Crises	$H(2) = 78.33, p < .001, \varepsilon^2 = .028$	$Z = -6.08, p < .001 (\uparrow)$	$Z = 8.70, p < .001 (\downarrow)$	$Z = 2.73, p = .006 (\downarrow)$
Geniuses in History and Fiction	$H(2) = 10.83, p = .004, \varepsilon^2 = .004$	$Z = 2.63, p < .013 (=)$	$Z = .25, p = .801 (=)$	$Z = 3.00, p = .008 (=)$
Legal System & Court	$H(2) = 84.10, p < .001, \varepsilon^2 = .029$	$Z = -6.86, p < .001 (\uparrow)$	$Z = 8.83, p < .001 (\downarrow)$	$Z = 2.05, p = .040 (\downarrow)$
Literature & Poetry	$H(2) = 23.86, p < .001, \varepsilon^2 = .008$	$Z = 4.12, p < .001 (=)$	$Z = -4.43, p < .001 (=)$	$Z = -0.32, p = .748 (=)$
Negative Emotions	$H(2) = 80.87, p < .001, \varepsilon^2 = .028$	$Z = -7.33, p < .001 (\uparrow)$	$Z = 8.34, p < .001 (\downarrow)$	$Z = 1.06, p = .291 (=)$
Performing Arts	$H(2) = 82.39, p < .001, \varepsilon^2 = .029$	$Z = 5.56, p < .001 (\downarrow)$	$Z = -9.04, p < .001 (\uparrow)$	$Z = -3.62, p < .001 (\uparrow)$
Problems & Conflicts	$H(2) = 98.35, p < .001, \varepsilon^2 = .034$	$Z = -7.66, p < .001 (\uparrow)$	$Z = 9.44, p < .001 (\downarrow)$	$Z = 1.85, p = .065 (=)$
Psychiatry Research & Science	$H(2) = 69.62, p < .001, \varepsilon^2 = .024$	$Z = 4.873, p < .001 (\downarrow)$	$Z = -8.33, p < .001 (\uparrow)$	$Z = -3.60, p < .001 (\uparrow)$
School & Education	$H(2) = 74.02, p < .001, \varepsilon^2 = .026$	$Z = -8.06, p < .001 (\uparrow)$	$Z = 6.89, p < .001 (\downarrow)$	$Z = -1.22, p = .222 (=)$
Service Clubs & Philanthropy	$H(2) = 94.94, p < .001, \varepsilon^2 = .033$	$Z = 3.31, p < .001 (\downarrow)$	$Z = -9.50, p < .001 (\uparrow)$	$Z = -6.45, p < .001 (\uparrow)$
Technology & Smart Devices	$H(2) = 7.38, p = .025, \varepsilon^2 = .003$	$Z = -2.68, p = .022 (=)$	$Z = 1.06, p = .290 (=)$	$Z = -1.69, p = .137 (=)$
Transportation	$H(2) = 75.88, p < .001, \varepsilon^2 = .027$	$Z = -7.33, p < .001 (\uparrow)$	$Z = 7.92, p < .001 (\downarrow)$	$Z = .62, p = .538 (=)$
Violent News Cases	$H(2) = 41.67, p < .001, \varepsilon^2 = .015$	$Z = -4.92, p < .001 (\uparrow)$	$Z = 6.17, p < .001 (\downarrow)$	$Z = 1.3, p = .194 (=)$
Work & Employment	$H(2) = 48.37, p < .001, \varepsilon^2 = .017$	$Z = -2.04, p = .041 (\uparrow)$	$Z = -4.50, p < .001 (\uparrow)$	$Z = -6.81, p < .001 (\uparrow)$

Table 2: Statistical details of the Kruskal–Wallis and Dunn’s post-hoc tests. For each variable, the Kruskal–Wallis statistic (H), p -value, and effect size (ε^2) are reported, along with Dunn’s post-hoc pairwise comparisons between timeframes. Arrows indicate the direction of change (\uparrow increase, \downarrow decrease, $=$ no significant change).

	Fear	Joy	Love	Sadness	Surprise	Anger
ASD & Inclusion	$\rho = -.10, p < .001$	$\rho = .12, p < .001$	$\rho = -.04, p = .030$	$\rho = -.08, p < .001$	$\rho = -.17, p < .001$	$\rho = .03, p = .109$
ASD Awareness	$\rho = -.39, p < .001$	$\rho = .46, p < .001$	$\rho = .30, p < .001$	$\rho = -.44, p < .001$	$\rho = .01, p = .783$	$\rho = -.44, p < .001$
Art Exhibitions	$\rho = -.37, p < .001$	$\rho = .38, p < .001$	$\rho = .33, p < .001$	$\rho = -.44, p < .001$	$\rho = .10, p < .001$	$\rho = -.44, p < .001$
Athletics & Awards	$\rho = -.34, p < .001$	$\rho = .28, p < .001$	$\rho = .31, p < .001$	$\rho = -.28, p < .001$	$\rho = .07, p < .001$	$\rho = -.34, p < .001$
Children & Adolescents	$\rho = .37, p < .001$	$\rho = -.29, p < .001$	$\rho = -.19, p < .001$	$\rho = .37, p < .001$	$\rho = -.11, p < .001$	$\rho = .37, p < .001$
Christmas Holidays	$\rho = -.38, p < .001$	$\rho = .44, p < .001$	$\rho = .33, p < .001$	$\rho = -.44, p < .001$	$\rho = .04, p = .045$	$\rho = -.41, p < .001$
Cinema & Movies	$\rho = -.19, p < .001$	$\rho = -.02, p = .423$	$\rho = .12, p < .001$	$\rho = -.09, p < .001$	$\rho = .18, p < .001$	$\rho = -.19, p < .001$
Coastal Tourism	$\rho = -.32, p < .001$	$\rho = .50, p < .001$	$\rho = .26, p < .001$	$\rho = -.42, p < .001$	$\rho = -.06, p = .001$	$\rho = -.37, p < .001$
Covid-19 Restriction Measures	$\rho = .46, p < .001$	$\rho = -.28, p < .001$	$\rho = -.31, p < .001$	$\rho = .31, p < .001$	$\rho = -.17, p < .001$	$\rho = .49, p < .001$
Family Dynamics & Crises	$\rho = .32, p < .001$	$\rho = -.48, p < .001$	$\rho = -.21, p < .001$	$\rho = .49, p < .001$	$\rho = .02, p = .244$	$\rho = .39, p < .001$
Geniuses in History and Fiction	$\rho = -.07, p < .001$	$\rho = -.16, p < .001$	$\rho = .04, p = .054$	$\rho = .07, p < .001$	$\rho = .16, p < .001$	$\rho = -.06, p = .002$
Legal System & Court	$\rho = .33, p < .001$	$\rho = -.46, p < .001$	$\rho = -.32, p < .001$	$\rho = .40, p < .001$	$\rho = -.03, p = .122$	$\rho = .47, p < .001$
Literature & Poetry	$\rho = -.23, p < .001$	$\rho = .07, p < .001$	$\rho = .23, p < .001$	$\rho = -.14, p < .001$	$\rho = .18, p < .001$	$\rho = -.28, p < .001$
Negative Emotions	$\rho = .29, p < .001$	$\rho = -.50, p < .001$	$\rho = -.22, p < .001$	$\rho = .49, p < .001$	$\rho = .03, p = .145$	$\rho = .40, p < .001$
Performing Arts	$\rho = -.34, p < .001$	$\rho = .27, p < .001$	$\rho = .31, p < .001$	$\rho = -.34, p < .001$	$\rho = .14, p < .001$	$\rho = -.39, p < .001$
Problems & Conflicts	$\rho = .45, p < .001$	$\rho = -.49, p < .001$	$\rho = -.32, p < .001$	$\rho = .47, p < .001$	$\rho = -.02, p = .265$	$\rho = .48, p < .001$
Psychiatry Research & Science	$\rho = -.24, p < .001$	$\rho = .37, p < .001$	$\rho = .22, p < .001$	$\rho = -.39, p < .001$	$\rho = .01, p = .549$	$\rho = -.36, p < .001$
School & Education	$\rho = .21, p < .001$	$\rho = -.31, p < .001$	$\rho = -.14, p < .001$	$\rho = .39, p < .001$	$\rho = -.06, p = .001$	$\rho = .29, p < .001$
Service Clubs & Philanthropy	$\rho = -.39, p < .001$	$\rho = .41, p < .001$	$\rho = .33, p < .001$	$\rho = -.40, p < .001$	$\rho = .04, p = .065$	$\rho = -.40, p < .001$
Technology & Smart Devices	$\rho = .21, p < .001$	$\rho = -.03, p = .130$	$\rho = -.11, p < .001$	$\rho = -.00, p = .921$	$\rho = -.04, p = .043$	$\rho = .07, p < .001$
Transportation	$\rho = .26, p < .001$	$\rho = -.42, p < .001$	$\rho = -.22, p < .001$	$\rho = .42, p < .001$	$\rho = -.03, p = .181$	$\rho = .37, p < .001$
Violent News Cases	$\rho = .12, p < .001$	$\rho = -.39, p < .001$	$\rho = -.14, p < .001$	$\rho = .33, p < .001$	$\rho = .09, p < .001$	$\rho = .22, p < .001$
Work & Employment	$\rho = -.03, p = .102$	$\rho = .27, p < .001$	$\rho = .03, p = .084$	$\rho = -.26, p < .001$	$\rho = -.08, p < .001$	$\rho = -.08, p < .001$

Table 3: Spearman correlations between emotion variables and topics. Each cell reports the correlation coefficient (ρ) and the FDR-corrected p -value.

	Toxicity	Insult	Severe Toxicity	Threat	Sexual Explicit	Identity Attack	Obscene
ASD & Inclusion	$\rho = -.06$ $p = .002$	$\rho = -.07$ $p < .001$	$\rho = .06$ $p = .001$	$\rho = .07$ $p < .001$	$\rho = .02$ $p = .241$	$\rho = .04$ $p = .064$	$\rho = .01$ $p = .597$
ASD Awareness	$\rho = -.22$ $p < .001$	$\rho = -.03$ $p = .083$	$\rho = .10$ $p < .001$	$\rho = .01$ $p = .696$	$\rho = -.04$ $p = .060$	$\rho = .07$ $p < .001$	$\rho = .14$ $p < .001$
Art Exhibitions	$\rho = -.17$ $p < .001$	$\rho = -.01$ $p = .795$	$\rho = .08$ $p < .001$	$\rho = -.01$ $p = .620$	$\rho = -.04$ $p = .046$	$\rho = .05$ $p = .006$	$\rho = .12$ $p < .001$
Athletics & Awards	$\rho = -.11$ $p < .001$	$\rho = -.01$ $p = .644$	$\rho = .02$ $p = .298$	$\rho = -.03$ $p = .110$	$\rho = -.04$ $p = .062$	$\rho = .02$ $p = .401$	$\rho = .05$ $p = .007$
Children & Adolescents	$\rho = .16$ $p < .001$	$\rho = .03$ $p = .205$	$\rho = -.02$ $p = .235$	$\rho = .07$ $p < .001$	$\rho = .04$ $p = .026$	$\rho = .02$ $p = .378$	$\rho = -.07$ $p < .001$
Christmas Holidays	$\rho = -.17$ $p < .001$	$\rho = -.05$ $p = .006$	$\rho = .06$ $p = .005$	$\rho = -.01$ $p = .482$	$\rho = -.05$ $p = .007$	$\rho = .04$ $p = .064$	$\rho = .07$ $p < .001$
Cinema & Movies	$\rho = .01$ $p = .495$	$\rho = .05$ $p = .020$	$\rho = -.03$ $p = .086$	$\rho = -.06$ $p = .001$	$\rho = -.04$ $p = .055$	$\rho = -.03$ $p = .161$	$\rho = .02$ $p = .421$
Coastal Tourism	$\rho = -.18$ $p < .001$	$\rho = -.06$ $p = .001$	$\rho = .10$ $p < .001$	$\rho = .04$ $p = .032$	$\rho = -.01$ $p = .689$	$\rho = .06$ $p = .001$	$\rho = .08$ $p < .001$
Covid-19 Restriction Measures	$\rho = .06$ $p = .02$	$\rho = -.05$ $p = .019$	$\rho = -.02$ $p = .363$	$\rho = .07$ $p < .001$	$\rho = .02$ $p = .242$	$\rho = .00$ $p = .865$	$\rho = -.09$ $p < .001$
Family Dynamics & Crises	$\rho = .21$ $p < .001$	$\rho = .07$ $p < .001$	$\rho = -.09$ $p < .001$	$\rho = -.00$ $p = .805$	$\rho = .03$ $p = .184$	$\rho = -.03$ $p = .111$	$\rho = -.09$ $p < .001$
Geniuses in History and Fiction	$\rho = .08$ $p < .001$	$\rho = .06$ $p = .001$	$\rho = -.05$ $p = .006$	$\rho = -.06$ $p = .005$	$\rho = -.02$ $p = .386$	$\rho = -.04$ $p = .055$	$\rho = -.01$ $p = .505$
Legal System & Court	$\rho = .11$ $p < .001$	$\rho = -.02$ $p = .363$	$\rho = -.12$ $p < .001$	$\rho = -.04$ $p = .045$	$\rho = -.02$ $p = .282$	$\rho = -.07$ $p < .001$	$\rho = -.13$ $p < .001$
Literature & Poetry	$\rho = .01$ $p = .727$	$\rho = .07$ $p < .001$	$\rho = .02$ $p = .335$	$\rho = -.02$ $p = .380$	$\rho = -.00$ $p = .980$	$\rho = .03$ $p = .172$	$\rho = .07$ $p < .001$
Negative Emotions	$\rho = .21$ $p < .001$	$\rho = .05$ $p = .013$	$\rho = -.11$ $p < .001$	$\rho = -.02$ $p = .244$	$\rho = .01$ $p = .651$	$\rho = -.06$ $p = .004$	$\rho = -.12$ $p < .001$
Performing Arts	$\rho = -.12$ $p < .001$	$\rho = .02$ $p = .441$	$\rho = .05$ $p = .020$	$\rho = -.03$ $p = .186$	$\rho = -.04$ $p = .053$	$\rho = .03$ $p = .082$	$\rho = .10$ $p < .001$
Problems & Conflicts	$\rho = .16$ $p < .001$	$\rho = .02$ $p = .339$	$\rho = -.08$ $p < .001$	$\rho = .01$ $p = .502$	$\rho = .00$ $p = .912$	$\rho = -.03$ $p = .149$	$\rho = -.11$ $p < .001$
Psychiatry Research & Science	$\rho = -.17$ $p < .001$	$\rho = -.02$ $p = .292$	$\rho = .11$ $p < .001$	$\rho = .04$ $p = .060$	$\rho = -.00$ $p = .887$	$\rho = .07$ $p < .001$	$\rho = .11$ $p < .001$
School & Education	$\rho = .19$ $p < .001$	$\rho = .05$ $p = .006$	$\rho = -.05$ $p = .008$	$\rho = .03$ $p = .177$	$\rho = .06$ $p = .001$	$\rho = -.01$ $p = .459$	$\rho = -.07$ $p < .001$
Service Clubs & Philanthropy	$\rho = -.17$ $p < .001$	$\rho = -.02$ $p = .287$	$\rho = .06$ $p < .001$	$\rho = -.01$ $p = .529$	$\rho = -.03$ $p = .104$	$\rho = .04$ $p = .036$	$\rho = .09$ $p < .001$
Technology & Smart Devices	$\rho = .02$ $p = .221$	$\rho = -.02$ $p = .424$	$\rho = .05$ $p = .012$	$\rho = .09$ $p < .001$	$\rho = .03$ $p = .086$	$\rho = .05$ $p = .020$	$\rho = -.00$ $p = .915$
Transportation	$\rho = .16$ $p < .001$	$\rho = .03$ $p = .187$	$\rho = -.09$ $p < .001$	$\rho = -.01$ $p = .470$	$\rho = .03$ $p = .203$	$\rho = -.05$ $p = .012$	$\rho = -.10$ $p < .001$
Violent News Cases	$\rho = .14$ $p < .001$	$\rho = .04$ $p = .066$	$\rho = -.11$ $p < .001$	$\rho = -.05$ $p = .006$	$\rho = -.00$ $p = .993$	$\rho = -.07$ $p < .001$	$\rho = -.10$ $p < .001$

Table 4: Spearman correlations between hate speech variables and topics. Each cell reports the correlation coefficient (ρ) and the FDR-corrected p -value.

	Social Disengagement	Dangerousness	Introversion	Madness	Rejection Blindness	Savant Skill	Touch Avoidance
ASD & Inclusion	$\rho = -.02$ $p = .424$	$\rho = -.18$ $p < .001$	$\rho = -.10$ $p < .001$	$\rho = -.26$ $p < .001$	$\rho = -.06$ $p = .005$	$\rho = -.19$ $p < .001$	$\rho = -.05$ $p = .010$
ASD Awareness	$\rho = -.14$ $p < .001$	$\rho = -.43$ $p < .001$	$\rho = -.29$ $p < .001$	$\rho = -.20$ $p < .001$	$\rho = -.38$ $p < .001$	$\rho = .10$ $p < .001$	$\rho = .06$ $p = .005$
Art Exhibitions	$\rho = -.16$ $p < .001$	$\rho = -.36$ $p < .001$	$\rho = -.22$ $p < .001$	$\rho = -.07$ $p < .001$	$\rho = -.36$ $p < .001$	$\rho = .19$ $p < .001$	$\rho = .03$ $p = .175$
Athletics & Awards	$\rho = -.20$ $p < .001$	$\rho = -.25$ $p < .001$	$\rho = -.07$ $p < .001$	$\rho = -.06$ $p = .003$	$\rho = -.25$ $p < .001$	$\rho = .25$ $p < .001$	$\rho = .02$ $p = .286$
Children & Adolescents	$\rho = .04$ $p = .033$	$\rho = .22$ $p < .001$	$\rho = .28$ $p < .001$	$\rho = .01$ $p = .557$	$\rho = .33$ $p < .001$	$\rho = -.21$ $p < .001$	$\rho = -.04$ $p = .062$
Christmas Holidays	$\rho = -.20$ $p < .001$	$\rho = -.41$ $p < .001$	$\rho = -.19$ $p < .001$	$\rho = -.18$ $p < .001$	$\rho = -.34$ $p < .001$	$\rho = .18$ $p < .001$	$\rho = .02$ $p = .313$
Cinema & Movies	$\rho = -.02$ $p = .295$	$\rho = .05$ $p = .012$	$\rho = .02$ $p = .297$	$\rho = .21$ $p < .001$	$\rho = -.10$ $p < .001$	$\rho = .22$ $p < .001$	$\rho = .04$ $p = .027$
Coastal Tourism	$\rho = -.20$ $p < .001$	$\rho = -.45$ $p < .001$	$\rho = -.24$ $p < .001$	$\rho = -.28$ $p < .001$	$\rho = -.33$ $p < .001$	$\rho = .06$ $p = .003$	$\rho = -.05$ $p = .006$
Covid-19 Restriction Measures	$\rho = .13$ $p < .001$	$\rho = .23$ $p < .001$	$\rho = .09$ $p < .001$	$\rho = -.05$ $p = .022$	$\rho = .25$ $p < .001$	$\rho = -.29$ $p < .001$	$\rho = -.02$ $p = .305$
Family Dynamics & Crises	$\rho = .10$ $p < .001$	$\rho = .46$ $p < .001$	$\rho = .38$ $p < .001$	$\rho = .26$ $p < .001$	$\rho = .39$ $p < .001$	$\rho = -.02$ $p = .336$	$\rho = .05$ $p = .008$
Geniuses in History and Fiction	$\rho = .03$ $p = .176$	$\rho = .18$ $p < .001$	$\rho = .12$ $p < .001$	$\rho = .26$ $p < .001$	$\rho = .02$ $p = .305$	$\rho = .18$ $p < .001$	$\rho = .04$ $p = .033$
Legal System & Court	$\rho = .14$ $p < .001$	$\rho = .41$ $p < .001$	$\rho = .19$ $p < .001$	$\rho = .16$ $p < .001$	$\rho = .29$ $p < .001$	$\rho = -.12$ $p < .001$	$\rho = .06$ $p = .002$
Literature & Poetry	$\rho = -.10$ $p < .001$	$\rho = -.05$ $p = .005$	$\rho = .01$ $p = .604$	$\rho = .15$ $p < .001$	$\rho = -.14$ $p < .001$	$\rho = .25$ $p < .001$	$\rho = .04$ $p = .069$
Negative Emotions	$\rho = .09$ $p < .001$	$\rho = .45$ $p < .001$	$\rho = .38$ $p < .001$	$\rho = .24$ $p < .001$	$\rho = .40$ $p < .001$	$\rho = -.01$ $p = .475$	$\rho = .07$ $p < .001$
Performing Arts	$\rho = -.14$ $p < .001$	$\rho = -.25$ $p < .001$	$\rho = -.13$ $p < .001$	$\rho = .02$ $p = .441$	$\rho = -.29$ $p < .001$	$\rho = .24$ $p < .001$	$\rho = .06$ $p = .002$
Problems & Conflicts	$\rho = .15$ $p < .001$	$\rho = .42$ $p < .001$	$\rho = .32$ $p < .001$	$\rho = .18$ $p < .001$	$\rho = .42$ $p < .001$	$\rho = -.17$ $p < .001$	$\rho = .03$ $p = .178$
Psychiatry Research & Science	$\rho = -.11$ $p < .001$	$\rho = -.36$ $p < .001$	$\rho = -.29$ $p < .001$	$\rho = -.18$ $p < .001$	$\rho = -.33$ $p < .001$	$\rho = .02$ $p = .283$	$\rho = -.05$ $p = .007$
School & Education	$\rho = .01$ $p = .472$	$\rho = .25$ $p < .001$	$\rho = .27$ $p < .001$	$\rho = .07$ $p < .001$	$\rho = .28$ $p < .001$	$\rho = -.06$ $p = .001$	$\rho = .02$ $p = .399$
Service Clubs & Philantropy	$\rho = -.23$ $p < .001$	$\rho = -.37$ $p < .001$	$\rho = -.19$ $p < .001$	$\rho = -.15$ $p < .001$	$\rho = -.34$ $p < .001$	$\rho = .20$ $p < .001$	$\rho = -.01$ $p = .802$
Technology & Smart Devices	$\rho = .07$ $p < .001$	$\rho = -.03$ $p = .138$	$\rho = -.00$ $p = .844$	$\rho = -.07$ $p < .001$	$\rho = .06$ $p = .001$	$\rho = -.23$ $p < .001$	$\rho = -.08$ $p < .001$
Transportation	$\rho = .08$ $p < .001$	$\rho = .35$ $p < .001$	$\rho = .25$ $p < .001$	$\rho = .14$ $p < .001$	$\rho = .30$ $p < .001$	$\rho = -.07$ $p < .001$	$\rho = .05$ $p = .011$
Violent News Cases	$\rho = .06$ $p = .002$	$\rho = .35$ $p < .001$	$\rho = .24$ $p < .001$	$\rho = .23$ $p < .001$	$\rho = .23$ $p < .001$	$\rho = .06$ $p = .002$	$\rho = .07$ $p < .001$
Work & Employment	$\rho = -.03$ $p = .145$	$\rho = -.25$ $p < .001$	$\rho = -.27$ $p < .001$	$\rho = -.21$ $p < .001$	$\rho = -.24$ $p < .001$	$\rho = -.11$ $p < .001$	$\rho = -.05$ $p = .009$

Table 5: Spearman correlations between stereotype variables and topics. Each cell reports the correlation coefficient (ρ) and the FDR-corrected p -value.