Doom-Scrolling under the microscope: The factors of a recurrent harmful behavior and its impact on online risk behavior, self-esteem, and pessimism

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Use of Technology Statement

Grammarly was used throughout this thesis to improve spelling and grammar. In some cases, it was also used to change repeated words and improve sentence fluency. Quilbot was used to paraphrase some sources found during the thesis formulation, and the resulting text was evaluated and rewritten. ChatGPT was also used to discover some theories related to doom-scrolling. This way, I was briefly informed about echo chambers, confirmation bias, and the bubble effect, and then I could incorporate those theories into my text by accurately searching for other reliable and scientific sources. The web platform Scribr was also used to automatically generate the citations for this study. In some cases, the citation format had to be corrected and modified according to APA guidelines. Figma was used to create the stimulus design, which involved three different versions of a speculative Facebook homepage. Finally, Jamovi was utilized for the statistical analysis, and Qualtrics was used to integrate the survey questions and stimulus design to expose participants to certain conditions explored in this thesis.

Abstract

This thesis investigated the impact of doom-scrolling in social media on individuals' online risk behavior, self-esteem, and pessimism, examining the potential effects of age and gender through exposure to dramatic and non-dramatic news displayed on a speculative Facebook homepage. Contrary to hypotheses, results from Repeated Measures ANOVA indicated no significant effects of type of news and age on online risk behavior, nor of gender and type of news on self-esteem or pessimism. The study faced limitations such as non-normal distributions, small sample size, and potential issues with stimuli design. Future research would need to address these limitations by increasing sample sizes, extending the duration of exposure, and enhancing experimental control should a similar scientific setting be considered. Additionally, incorporating diverse social media platforms and longitudinal designs may offer deeper insights into the long-term psychological impacts of doom-scrolling.

Keywords: doom-scrolling, type of news, online risk behavior, self-esteem, pessimism, age, gender

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Doom Scrolling under the microscope: The factors of a recurrent harmful behavior and its impact on self-esteem, pessimism, and online risk behavior

Social media has become the primary source of daily news consumption in our modern era. This trend is evidenced by the fact that almost 62% of adults rely on digital environments for information (Peterson, 2024). Among the various social networks, X (formerly Twitter) and Facebook emerge as the most popular platforms for news consumption, with a substantial 53% and 44% of their users, respectively, using these platforms to stay informed (Peterson, 2024).

One notable behavior pattern that has surfaced with the rise of social media news consumption is doom-scrolling. The Merriam-Webster dictionary defines this term as "*the excessive time spent online browsing news or other content that causes negative emotions, such as sadness, anxiety or anger*." The prevalence of doom-scrolling was particularly pronounced during the COVID-19 pandemic when individuals were constantly bombarded with distressing news (Miller, 2023).

Social media platforms can further enhance the phenomenon of doom-scrolling, as they can curate content to their users according to their preferences (Qudah et al., 2020). Under this condition, users' navigation inside the platforms is tracked and monitored, either because they consent to this electronic surveillance by accepting all cookies (Oyedele, 2023) or because of the ability of social media to collect data without users' acquiescence (Adisa, 2023). Platform algorithms can then regulate content visibility, sequence, and recommendations following users’ behavior (Adisa, 2023).

Other behavioral patterns identified through monitoring are connection and engagement (DragonSearch, 2021). In terms of engagement, users interact in different ways by commenting, sharing, or liking posts. For this to happen, however, the content of the post in question must first stimulate and arouse the user's interest (Pew Research Center, 2024).

While online, users also spend a substantial amount of time reinforcing their social capital by bridging and bonding with other users, meaning connecting and improving their existing relationships with peers and meeting new people online, respectively (Ryan et al., 2017). These behaviors contribute to the creation of echo chambers, where users interact mainly with like-minded people, reinforcing their opinions and potentially worsening the conditions of doom-scrolling. Echo chambers will be introduced and analyzed extensively in the theoretical framework of this thesis.

Existing literature has already investigated the effects of doom-scrolling - also called doom-surfing - highlighting the negative impact on human mental health (Shabahang et al., 2022). Specifically, the influence of doom-scrolling on depression and post-traumatic stress disorder (PTSD) has been evidenced (Sharma et al., 2022). This disorder arises from experiencing or witnessing a frightening, terrible, or deadly incident (Substance Abuse and Mental Health Services Administration, 2023). An interesting research study attributes individuals' tendency to prioritize negative news to negativity bias. It also showed that doom-scrolling was positively associated with impulsivity and risk behavior (Shabahang et al., 2022). According to Soleimani et al. (2017), depression and anxiety are significant determinants of the development of risk behaviors such as alcohol use, illegal substance use, unprotected sexual activity, dangerous driving, illegal activities like trespassing or vandalism, fighting, and truancy. Those effects concern a potential transformation in offline risk behavior. Considering these scientific clues, this thesis will endeavor to provide further aspects of risk behavior connected with doom-scrolling, focusing on users' online activity. At the same time, it will also emphasize other features directly linked to anxiety and depression, which are traits that have already been examined, such as low self-esteem and pessimism. In that way, further insights will be given into how doom-scrolling affects human mental health and well-being.

Considering the above points and the research gap that was found, the following research question was developed:

"*To what extent does Doom-scrolling in social media affect online risk behavior, self-esteem, and pessimism?*"

The subject of this study delves into an increasingly relevant aspect of modern digital culture: the phenomenon of doom-scrolling on social media platforms and its potential impacts on individual online behavior and mental well-being. In an era where a significant portion of the population relies on social media as a primary news source, understanding this research's scientific and societal relevance is crucial.

Firstly, the societal significance lies in the widespread use of social media for news consumption. Given that many individuals rely on social media sites like Facebook and Twitter to keep up to date, it is clear that these digital spaces greatly influence public opinion. However, how user behavior and algorithms are used to curate content on these platforms raises significant concerns regarding the spread of information and its possible effects.

From a scientific point of view, this thesis offers evidence of quantitative analysis at the intersection of technology, psychology, and behavior. By exploring doom-scrolling and its effects on self-esteem, pessimism, and online risk behavior, this thesis studies the relationship between previously unexplored variables, offering new insights into human cognition and emotional responses in the digital age.

Theoretical Framework

With the phenomenon of doom-scrolling as its primary research object, this study will attempt to explain why individuals indicate this particular behavior on social media.

Echo Chambers

In today's digital age, how individuals consume information has dramatically changed. Social media platforms have become primary news sources and opinions, shaping

public discourse and personal beliefs. This shift has increased the speed and reach of information and affected the diversity of perspectives people are exposed to (Modgil et al., 2021). However, social media users often follow specific sources and news, sticking to this informational pattern for quite some time.

One possible explanation that could justify this tendency may lie in echo chambers. According to Ruiz and Nilsson (2022), echo chambers refer to virtual environments, particularly on social media platforms, where individuals are surrounded by people who share their values and perspectives and are exposed to material that reinforces their beliefs. These chambers tend to narrow exposure to varied perspectives, resulting in a bubble effect, meaning the tendency to affiliate with one's peers, that isolates users from opposing viewpoints (Slechten et al., 2021). This dynamic is further intensified by social media algorithms designed to promote and prioritize content that generates the greatest attention and interactivity. Adisa (2023) mentions that this strategy, known as algorithmic amplification (Brady & Us, 2024), aims to keep users engaged by continually presenting content that aligns with their pre-existing notions and preferences.

While highly engaging content can be beneficial, the problem arises when these echo chambers and algorithmic amplification focus on unfavorable news. This selective exposure might lead to a feedback loop in which users are continuously exposed to negative information. Therefore, if an online community becomes engrossed in unfavorable news, it is very likely that users will follow and engage with this content, copying their peers' behavior. This phenomenon is also known as confirmation bias, as Nickerson (1998) noted.

The situation can worsen because social media platforms have long utilized this strategy of promoting high-engaging content to generate higher ad revenue, which is crucial for their financial growth (EZ Rankings – Premium Digital Marketing Agency, 2023). Thus,

when harmful content is amplified, it reinforces existing biases and drives greater user engagement, further increasing the echo chamber effect and confirmation bias among users.

Online behavior

Online behavior encompasses various activities and tendencies individuals exhibit while interacting on the internet. According to Johnson and Kulpa (2007), online behavior includes both organized (e.g., search) and unorganized (e.g., browsing) interactions with both human (e.g., chat) and non-human (e.g., database) elements in online settings. The key characteristics of online behavior are sociability (motivation for human connection), utility (focus on efficiency), and reciprocity.

Online Risk Behavior

A critical domain of online behavior that arouses many concerns is online risk behavior. Gainsbury et al. (2018) identify this behavior, among other aspects, as an individual's susceptibility to post personal information or interact and speak in online communities, either publicly or privately, inappropriately. It is mainly observed during someone’s adolescence, as at this stage of life, individuals show an increased vulnerability to start engagement in risk-related behaviors (Gámez-Guadix et al., 2016).

According to a survey conducted among 8,000 youth aged between 16-19 (Davidson et al., 2022), 25% had followed or trolled someone online, 12.5% had harassed someone in an online environment, 10% had hacked or used hate speech, 20% had sexted, and 33.3% had engaged in digital piracy. Additionally, 40% reported having watched pornography material. In an interview in “The Guardian” (Milmo, 2022), the researcher, Julia Davidson, claimed that a generation of young people in Europe was almost entirely accustomed to engaging in dangerous and illegal online behavior.

Theory of Planned Behavior in Online Risk Behavior

The theory of planned behavior could explain these controversial tendencies of young people. The theory of planned behavior (TPB) is a psychological theory that connects ideas to conduct. The concept posits that an individual's behavioral intentions are shaped by three fundamental components: attitude, subjective norms, and perceived behavioral control, and they were first presented by Icek Ajzen (1991) to increase the theory of reasoned action (TRA) capacity for prediction. According to TPB, behavioral intention is the most direct predictor of human social conduct.

Pabian and Vandebosch (2013) utilized TPB to explain and understand cyberbullying, which is considered an online risk behavior. It was shown that subjective norm (SN), perceived behavioral control (PBC), and attitude (A) account for 88.8%, 38.2%, and 24.6% of the variance in someone’s beliefs, respectively. In addition, the direct measurements of SN, A, and PBC account for 28.8% of the variance of the intention to cyberbully, and intention, in turn, explains 8.6% of the reported behavior six months later.

Dramatic bad news and its impact on adolescents

According to the certified journalist Stockton (2020), "*Wars, plane crashes, mass shootings, hurricanes, fires, earthquakes, and volcanic eruptions*" are considered dramatic and unfavorable news by their nature and attract increased public attention (Birkland, 1998). Conversely, non-dramatic events do not arouse public interest (Cambridge Dictionary, n.d.). Those, for example, concern car accidents, which, despite being lethal in many cases, do not elicit media recipients’ attention because of their high frequency of occurrence (Klinkenberg, 2017). As an adverse content exposed to adolescents in social media, dramatic news evokes specific behavioral patterns. Weir (2023) highlights the adverse outcomes of such content, referring, among other things, to the likelihood of youth engaging in risky behaviors such as

harming others. A harmful behavior observed among young individuals is cyberbullying, as already mentioned, which is an online-risk behavior (Baumann et al., 2022).

Considering the evidence regarding the intersection of dramatic news and young individuals analyzed above, this study will attempt to verify the following hypotheses:

H1a: Young individuals between 16 and 19 will be more inclined toward online risk behavior after exposure to doom scrolling conditions.

H1b: Young individuals between 16 and 19 will show higher inclinations to perform online risk behavior when exposed to dramatic news than non-dramatic news.

Self-esteem

Self-esteem refers to a positive or negative attitude toward oneself or a general evaluation of one's value (Department of Sociology, 2021). In psychology, it has been demonstrated that high self-esteem is desirable since it is linked to many favorable outcomes, including happiness (Baumeister et al., 2003), relationship satisfaction, and a decreased incidence of criminal activity (Orth & Robins, 2014). The benefits of high self-esteem are thought also to include better mental and physical health and a decrease in anti-social behavior (Orth & Robins, 2022). In contrast, anxiety, loneliness, and a higher susceptibility to substance addiction have been identified as disadvantages of low self-esteem (University of Texas Counselling and Medical Centre, n.d.).

Studies have shown that self-esteem fluctuates for individuals of different genders. Bleidorn et al. (2016) highlight a significant gender gap, with men often reporting greater levels of self-esteem than women. This gender difference starts to show in youth and continues throughout early and middle adulthood before narrowing and possibly closing completely in old age.

In a meta-analysis among 32,486 individuals encompassing ten domains of self-esteem, Gentile et al. (2009) also evidenced that men scored substantially higher than women

on physical appearance, athletic, personal self, and self-satisfaction self-esteem. On the other hand, women scored higher in behavioral conduct and moral-ethical self-esteem.

Dramatic news for different genders

Tragedies, closely related to drama as described by Aristotle (Conversi & Sewall, 2024), can affect genders differently. Spence et al. (2009) found that women exhibit higher levels of sadness than men when exposed to "Tragic News Stories." Sadness, a symptom of depression (National Institute of Mental Health, n.d.), can also be linked to doom-scrolling. Engaging with and reading adverse events on social media emotionally devastates users, leading to increased levels of depression and anxiety, as discussed in the introduction. According to Nguyen et al. (2019), these two traits are negatively associated with self-esteem, contributing to a dramatic decline when the levels of both depression and anxiety indicate a noticeable increase.

Considering this scientific evidence, it is expected that the following hypothesis will be verified:

H2a: After exposure to doom-scrolling, men will report higher self-esteem scores than women.

H2b: Men will report higher self-esteem levels than women, particularly when both groups are exposed to dramatic news rather than non-dramatic news.

Pessimism

Pessimism is a mindset in which one expects a negative result from a particular circumstance (Bennett, 2001). This trait has been linked to less perseverance in promoting health and behaviors that indicate a disinterest in life (Wiebe et al., 2018). Pessimists frequently concentrate on the bad aspects of life in general and often face increased levels of depression, conflict, and anxiety (Scott, 2022), as well as worse health and decreased well-being. The tendency to expect the worst can significantly impact various aspects of a

pessimist's life. Pessimists are reported to be less likely to engage in proactive health behaviors such as regular exercise (Scheier & Carver, 2018) and a balanced diet (Pänkäläinen et al., 2018). In addition to these disturbing insights, Hawkley and Cacioppo (2010) have developed a loneliness model under which feelings of hostility, stress, pessimism, anxiety, and low self-esteem reinforce a loneliness loop by triggering neurobiological and behavioral mechanisms that contribute to poor health outcomes. On the other hand, optimists report lower stress levels and a greater sense of fulfillment in life (Scott, 2022).

Across multiple studies investigating the levels of pessimism, variations have been found again for different gender types. In particular, two research studies by Craig et al. (2023) and Hinz et al. (2017) showed lower levels of pessimism for women and higher levels for men. Conversely, women noted higher levels of optimism compared to men.

The recall of dramatic news for men and women

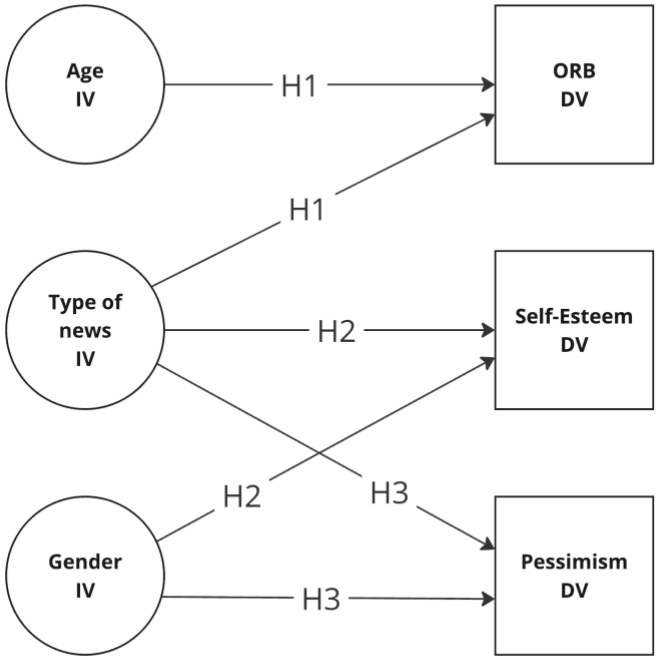
Males exhibit "*the best recognition memory and comprehension scores for negatively valenced messages,"* leading to a negativity bias (Grabe & Kamhawi, 2006). In contrast, women show an avoidance response to negatively framed news and find positively framed stories more engaging and stimulating, leading to better absorption of the positive information they are exposed to. Having this inclination toward retrieving memories of negative news, men will probably indicate higher levels of pessimism, as recalling negative news causes individuals to be more pessimistic (Steenwyk, 2024), mainly when those are based on dramatic events.

As with self-esteem, some studies have reported a significant association between pessimism and depression or anxiety. Again, considering the impact of doom-scrolling implications in both anxiety and depression but also the significant association between pessimism and those traits (Zenger et al., 2010), it can be assumed that the following hypothesis will be substantiated:

H3a: After exposure to doom-scrolling, men will exhibit higher levels of pessimism than women.

H3b: Men will exhibit higher pessimism levels than women, particularly when both are exposed to dramatic news rather than non-dramatic news.

Figure 1 - *A diagram displaying the investigating hypotheses and the variables considered.*



Methods

To assess the impact of doom-scrolling on self-esteem, pessimism and online risk behavior, a quantitative research approach was employed. Specifically, a within and between-subjects experiment with repeated measures was formulated and consisted of three conditions in which participants were randomly assigned. These conditions involved a speculative news feed of an online platform containing (a) dramatically reported bad news through shared videos, (b) dramatically reported bad news accompanied by images or relevant articles, and also (c) non-dramatic news.

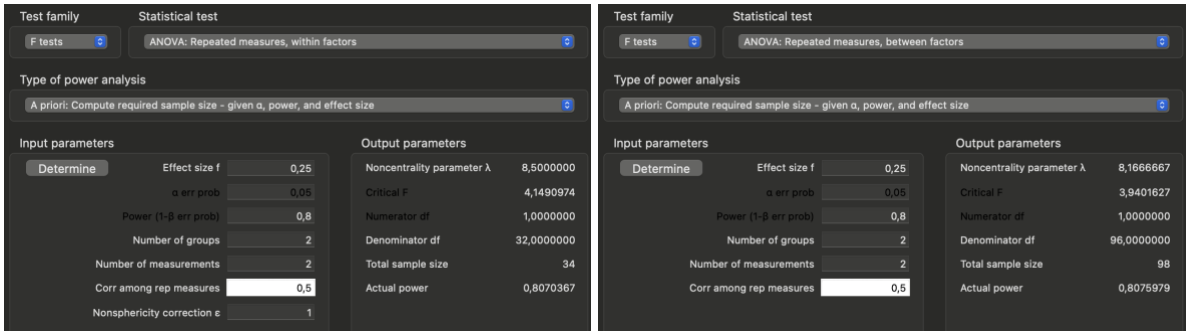
The independent variables (IV) to be tested were “type of news,” "age," and “gender.” The type of news comprised the three levels mentioned in the methods' introduction (dramatic news videos, dramatic news articles, and non-dramatic news). Age and gender encompassed two levels of male and female participants and individuals aged between 16 and 19, respectively. The dependent variables (DV) considered were online risk behavior, self-esteem, and pessimism, and they were assessed through latent constructs of relevant questionnaires embedded in an online survey.

Participants

Target Audience

This study aimed to recruit at least 98 participants. The sample size was determined through two G*Power analyses, both considering a medium-sized effect for the upcoming Repeated Measures ANOVA tests due to the study's short timeline. For the within-subjects comparison focusing on young individuals aged 16-19 and the type of news, a Repeated Measures ANOVA with within factors was used to calculate the sample size ($\alpha = .05$, power = .80, $f = .25$). For the comparisons involving two gender groups and the type of news, a Repeated Measures ANOVA with a between factors comparison was conducted ($\alpha = .05$, power = .80, $f = .25$) (See Figure 2).

Figure 2 - *The G*Power tests accompanied by the developed results.*



The final sample size of 98 participants was determined based on the second G*Power test, as it yielded the highest requirement, and participants from the first analysis

overlapped this sample. Both tests indicated an almost 81% chance of correctly rejecting the null hypothesis for all cases investigated.

A collection of an equal number of male and female participants was attempted to make balanced between-subjects comparisons. For the within-subjects comparison, an effort was made to gather at least 34 participants between 16 and 19 years old, given that these adolescents are more prone to engage in online risk behavior (Davidson et al., 2022). Moreover, individuals deriving from Greek nationality were taken into account, and the stimulus was formulated according to this demographic. In this way, the researcher attempted to collect homogeneous data that provided answers regarding national news in which a higher interest is shown in general (Mitchell, 2019).

Recruitment

For the necessary data collection, a non-probability convenience sample was used. Potential participants were reached through email contacts and messages on online platforms. The recruitment materials briefly described the study's goals and contact details should the participants seek further explanation regarding the experiment’s purposes.

Materials

The stimuli of this thesis comprised one online survey formed in Qualtrics software (Qualtrics, 2024). The survey content involved latent constructs assessing the extent of online risk behavior, self-esteem, and pessimism, presented as pre-test and post-test measurements. In between, a speculative news feed that simulated the Facebook homepage containing national unfavorable news was used to expose participants to “doom-scrolling conditions.” The unfavorable news in the simulation involved the present and past to coincide with theories of retrieval of past dramatic news for men (H3a, H3b), but also current dramatic news that affects women more (H2a, H2b). The Facebook simulation was designed using Figma software (Figma, n.d.), through which both dramatically and non-dramatically

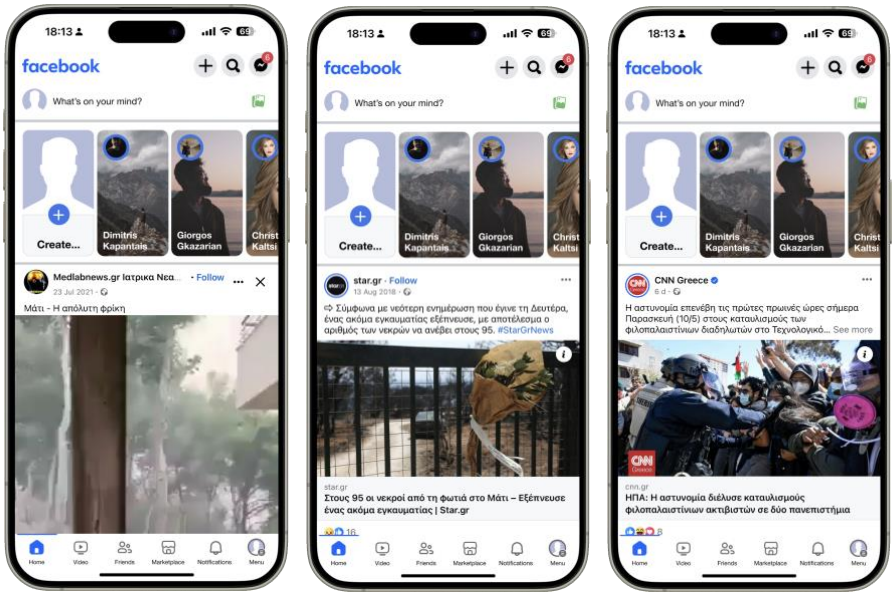
reported bad news feeds were developed. Lastly, queries about demographic details and behavioral patterns were also incorporated.

The statistical analysis of the data obtained from the online survey was conducted in Jamovi (Jamovi, n.d.). Through this process, the study explored the potential differences between the audience groups examined. The questions were arranged to reduce the total response time so that participants could give accurate answers. Individuals could still choose "I prefer not to say" in response to questions that make them uncomfortable.

Procedures

Participants responded to an online survey on Qualtrics with an approximate completion time of eight minutes. Initially, they were presented with a consent form informing them about the purposes of the study. After giving their consent, participants proceeded to the first part of the survey, which included inquiries about gender, age, and preferred media news sources. Following, they were asked to rate their degree of online risk behavior, pessimism, and self-esteem. Then, they were exposed to a randomly chosen stimulus from a news feed, where they interacted, scrolled down, and spent five minutes reading unfavorable national news (See Figure 3).

Figure 3 - *Speculative News Feed of an Online Social Media Platform - All three conditions.*



After exposure to doom-scrolling conditions, another behavioral question was presented regarding participants' intention to scroll and learn more about the encompassed events on this hypothetical Facebook homepage. In the end, they resubmitted another questionnaire of similar construct assessments so that the researcher could explore if their traits had changed after experiencing doom-scrolling circumstances.

Measurements

In the online survey, different latent constructs were used to measure online risk behavior, self-esteem, and pessimistic attitudes, which were required for the upcoming statistical analysis. For the online risk behavior assessment, a construct presented by Lee et al. (2015) was utilized. Within this framework, two dimensions of online risk behavior were analyzed: verbal or written perpetration or social exclusion perpetration. These two dimensions were selected to showcase participants' tendency to blame a particular organization of Greek society, such as the government or a social community, as people tend to blame the politicians or official authorities of a country for bad events that occur (Pew Research Center, 1998). For the post-test measurements, the phrase "intend to" was added to each item to investigate whether respondents' intentions changed after interacting with the Facebook homepage. Following, a scale including ten questions created by Rosenberg (2002), was used for the self-esteem assessment.

Regarding the pessimism evaluation, the Dember et al. (1989) construct was integrated within the survey scale measurements. From the original set of 56 questions, the 10 most relevant were selected to ensure quick responses and maintain participant interest. This approach helps participants complete the survey within the ideal duration of 10 minutes, as Chinn (2023) suggests. The chosen questions were also modified and simplified to maintain a comprehensive interpretation by removing unnecessary words that increased the length of the sentences.

All responses concerning the measurable constructs were structured on a 5-point scale. This rationale allows participants to follow this online assessment in a quick manner without getting overwhelmed (Collaborators, 2024).

Example questions for each chosen construct

The following statements concern your online risk behavior assessment. On a scale of 1 to 5 (Never – Very often), please indicate how often you have acted in the way described below by attributing responsibility for the bad events (e.g., flood, fire, railway accident) that have affected Greece in recent years, to an organization (e.g., government, social community) in Greek society. Pre-test Q1: "I have sent mean text messages on the mobile phone." Post-test Q1: "I intend to send mean text messages on the mobile phone" (See Appendix A).

The following assessments concern your self-esteem and pessimism traits. On a scale from 1 to 5 (Strongly disagree - Strongly agree), please indicate how much you agree or disagree with the following statements. Self-esteem assessment - Pre-test and Post-test Q10: "At times, I think I am no good at all" (See Appendix B). Pessimism assessment - Pre-test and Post-test Q1: "I feel like there's too much to do and not enough time" (See Appendix C).

In addition to the measurement constructs, one more scale question was included within the survey questionnaire to ascertain whether participants tend to "doom-scroll" even more after being exposed to adverse news. The question at hand was also measured on a 5-point scale (Definitely no - Definitely yes) and is mentioned below:

"Would you like to scroll and learn more about the events presented on this hypothetical Facebook homepage?" (See Appendix D)

Results

Straightliners – Input Errors

The initial sample consisted of 165 respondents. Of these, however, 54 were removed as it was observed that they did not complete the survey process. Before running the analysis,

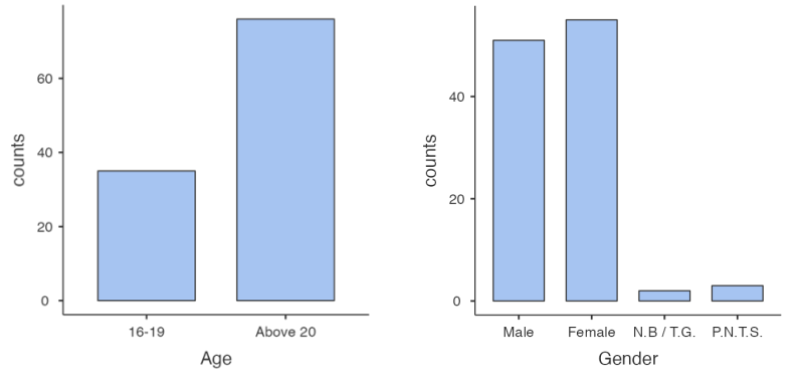
a screening was conducted for input errors and straightliners, meaning responses where people answered the same to all questions in the scale. No straightliners or input errors were identified.

Descriptives

Age and Gender

From the total 111 individuals that completed the survey, 51 identified themselves as males (45.9%), 55 as females (49.5%), 2 as a non-binary/third gender (1.8%), and 3 stated that they would prefer not to state their gender (2.7%). Regarding participants' age, 35 were between 16 and 19 (31.5%), and the remaining 76 were above 20 (68.5%) (See Figure 4).

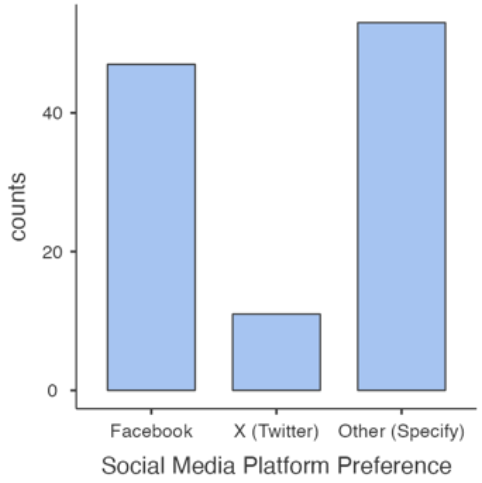
Figure 4 - *Bar plots illustrating the distribution of participants' age and gender.*



Social Media Platform Preference as a News Source

As a social media platform preference, 53 participants (47.7%) stated that they would prefer other platforms to get their news. Among those individuals, 17 (15.3%) noted that they would choose Instagram and 11 (9.9%) TikTok. Facebook stood out as the most frequent platform in terms of its utilization as a news source, with 47 participants (42.3%) choosing Meta's social media. In contrast to the reports found and presented in this thesis, participants also showed a low preference for X, with only 11 (9.9%) selecting this platform (See Figure 5).

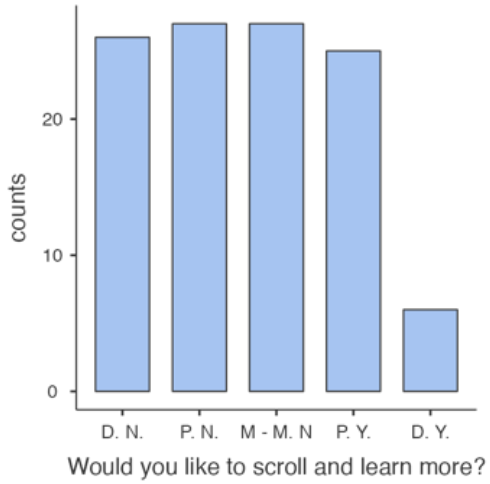
Figure 5 - *A bar plot illustrating the distribution of participants' social media preference as a news source.*



Further Doom-scrolling probabilities

When asked if they would like to scroll and learn more about this kind of news, 26 participants (23.4%) responded definitely no, 27 (24.3%) probably no, another 27 (24.3%) might or might not, 25 (22.5%) probably yes, and the rest 6 (5.4%) answered definitely yes (See Figure 6).

Figure 6 - *A bar plot illustrating the distribution of participants' probability to scroll and see further negative news.*



Pre-tests for ORB, Self-esteem, and Pessimism

The mean ORB pre-test measure was 1.93 (*SD* = 0.72), and the reliability analysis was high, α = .876. The self-esteem mean score before doom-scrolling conditions was 3.72 (*SD* = 0.65), and the reliability value was good, α = .804. The pessimism pre-test mean score was 2.88 (*SD* = 0.66), and Cronbach's alpha test also generated a high value, α = .810.

Post-tests for ORB, Self-esteem, and Pessimism

The mean ORB post-test score was 1.99 (*SD* = 0.79), and the reliability analysis was significantly high, α = .911. After exposing participants to adverse news, the self-esteem mean score was 3.74 (*SD* = 0.66), and the reliability value was good, α = .837. The pessimism post-test mean score was 2.93 (*SD* = 0.73), and Cronbach's alpha test also generated a high value, α = .852 (See Figures 7-9).

Figure 7 - *Box plots illustrating age and type of news distribution for Pre-test and Post-test ORB.*

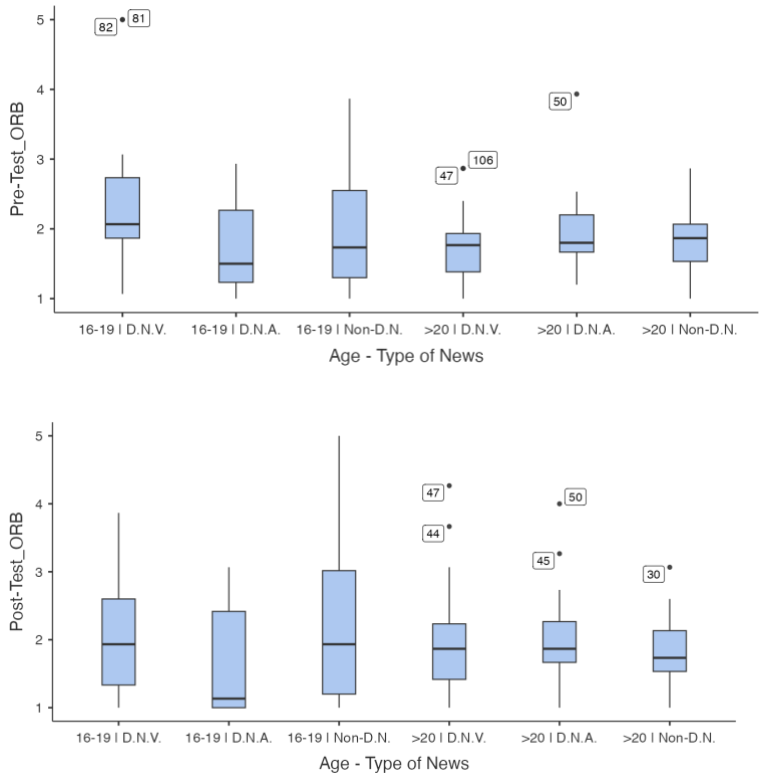


Table 1

	Age - Type of News	N	Mean	SD
Pre-Test ORB	16-19 | D.N.V.	13	2.10	0.50
	16-19 | D.N.A.	6	1.77	0.77
	16-19 | Non-D.N.	12	2.04	0.98
	>20 | D.N.V.	34	1.73	0.45
	>20 | D.N.A.	21	1.94	0.58
	>20 | Non-D.N.	20	1.82	0.44
Post-Test ORB	16-19 | D.N.V.	13	2.12	0.89
	16-19 | D.N.A.	6	1.69	0.97
	16-19 | Non-D.N.	12	2.28	1.36
	>20 | D.N.V.	34	1.97	0.71
	>20 | D.N.A.	21	2.06	0.67
	>20 | Non-D.N.	20	1.80	0.50

Figure 8 - *Box plots illustrating the gender and type of news distribution for Pre-test and Post-test Self-esteem.*

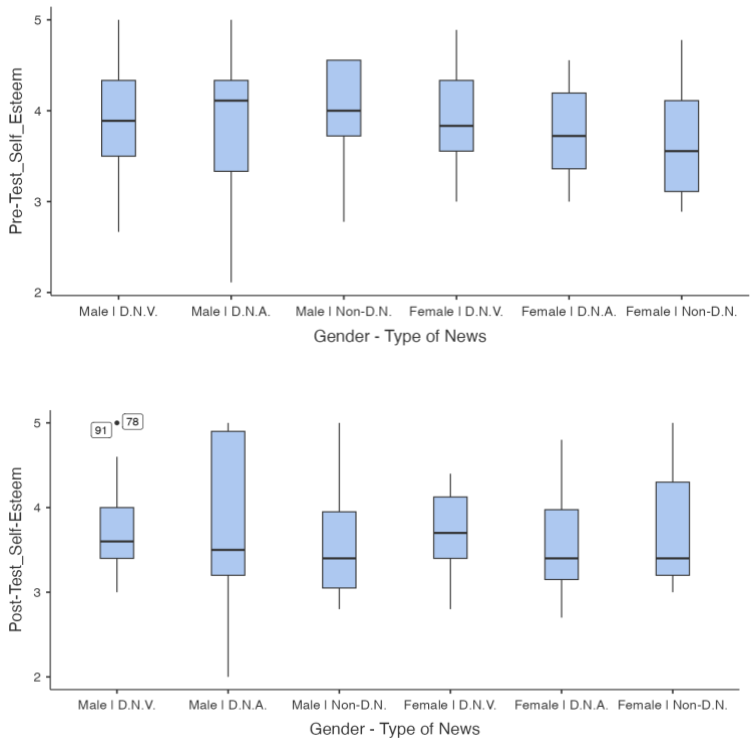


Table 2

	Gender - Type of News	N	Mean	SD
Pre-Test Self-esteem	Male | D.N.V.	23	3.81	0.62
	Male | D.N.A.	17	3.79	0.79
	Male | Non-D.N.	11	3.87	0.60
	Female | D.N.V.	24	3.81	0.51
	Female | D.N.A.	10	3.65	0.49
	Female | Non-D.N.	21	3.63	0.56
Post-Test Self-esteem	Male | D.N.V.	23	3.76	0.56
	Male | D.N.A.	17	3.89	0.96
	Male | Non-D.N.	11	3.59	0.70
	Female | D.N.V.	24	3.72	0.48
	Female | D.N.A.	10	3.56	0.62
	Female | Non-D.N.	21	3.67	0.61

Figure 9 - *Box plots illustrating the gender and type of news distribution for Pre-test and Post-test Pessimism.*

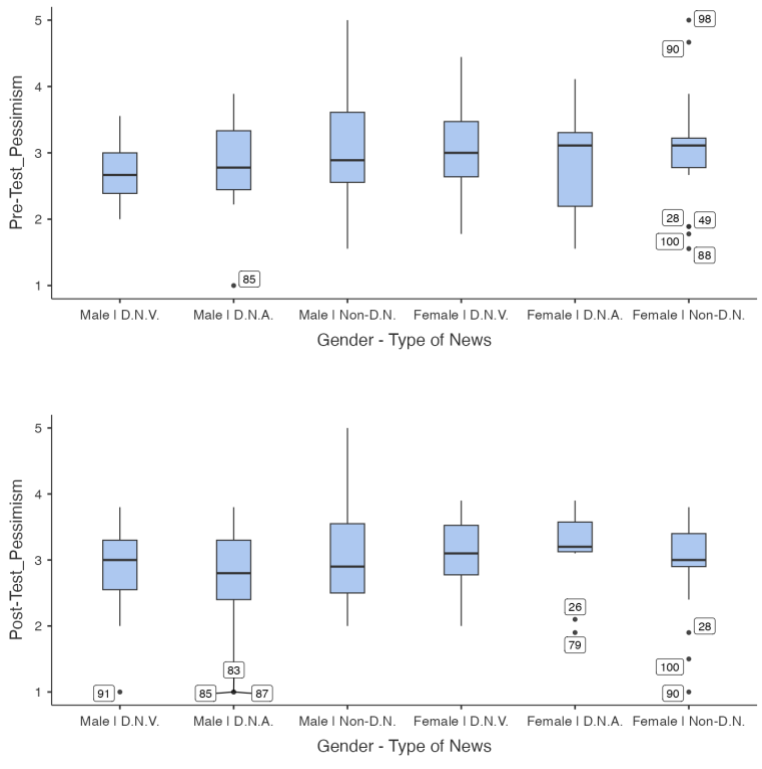


Table 3

	Gender - Type of News	N	Mean	SD
Pre-Test Pessimism	Male | D.N.V.	23	2.69	0.42
	Male | D.N.A.	17	2.84	0.64
	Male | Non-D.N.	11	2.96	0.87
	Female | D.N.V.	24	2.95	0.61
	Female | D.N.A.	10	2.81	0.82
	Female | Non-D.N.	21	2.99	0.74
Post-Test Pessimism	Male | D.N.V.	23	2.87	0.63
	Male | D.N.A.	17	2.62	0.95
	Male | Non-D.N.	11	3.11	0.85
	Female | D.N.V.	24	3.06	0.54
	Female | D.N.A.	10	3.13	0.65
	Female | Non-D.N.	21	2.92	0.71

Normality - Homogeneity of Variances

In pre-test and post-test measurements, ORB for Age and Type of News was not normally distributed. Homogeneity of variances could not be assumed, as both VR tests were violated ($VR_{Pre\text{-}test} = 6.62$, $VR_{Post\text{-}test} = 6.90$).

Self-esteem for Gender and Type of News was normally distributed in the pre-test inspection but not in the post-test. The homogeneity of variances was not substantiated, with both VR tests indicating a value greater than 2 ($VR_{Pre\text{-}test} = 2.74$, $VR_{Post\text{-}test} = 3.21$).

Pessimism was also investigated, and it was found to be normally distributed for Gender and Type of News in the pre-test inspection but not in the post-test. The VR tests again generated a higher value than 2 ($VR_{Pre\text{-}test} = 4.25$, $VR_{Post\text{-}test} = 3.15$); thus, the homogeneity of variances could not be assumed. Therefore, the outcomes of the upcoming tests may not be completely robust due to the VR violation in all three cases examined.

Table 4

		Z-values	
		Skewness	Kurtosis
Pre-Test ORB	16-19 | D.N.V.	2.80	1.97
	16-19 | D.N.A.	0.95	-0.63
	16-19 | Non-D.N.	1.47	-0.35
	>20 | D.N.V.	1.43	0.92
	>20 | D.N.A.	4.22	6.84
	>20 | Non-D.N.	0.86	0.67
Post-Test ORB	16-19 | D.N.V.	1.02	-0.15
	16-19 | D.N.A.	1.13	-0.97
	16-19 | Non-D.N.	1.52	-0.04
	>20 | D.N.V.	3.40	3.45
	>20 | D.N.A.	2.66	2.57
	>20 | Non-D.N.	1.32	0.08

Table 5

		Z-values	
		Skewness	Kurtosis
Pre-Test Self-esteem	Male | D.N.V.	-0.61	-0.34
	Male | D.N.A.	-1.21	-0.32
	Male | Non-D.N.	-1.20	-0.05
	Female | D.N.V.	0.06	-0.63
	Female | D.N.A.	0.45	-0.89
	Female | Non-D.N.	0.61	-1.08
Post-Test Self-esteem	Male | D.N.V.	2.17	0.35
	Male | D.N.A.	-0.19	-1.11
	Male | Non-D.N.	1.47	0.02
	Female | D.N.V.	-0.49	-1.06
	Female | D.N.A.	1.17	0.34
	Female | Non-D.N.	1.73	-0.58

Table 6

		Z-values	
		Skewness	Kurtosis
Pre-Test Pessimism	Male | D.N.V.	0.32	-0.78
	Male | D.N.A.	-1.60	1.68
	Male | Non-D.N.	0.66	0.28
	Female | D.N.V.	0.13	0.006
	Female | D.N.A.	-0.74	-0.74
	Female | Non-D.N.	0.86	1.03
Post-Test Pessimism	Male | D.N.V.	-2.40	2.32
	Male | D.N.A.	-1.44	-0.61
	Male | Non-D.N.	1.45	0.91
	Female | D.N.V.	-0.72	-0.66
	Female | D.N.A.	-1.76	0.39
	Female | Non-D.N.	-2.82	1.89

Repeated Measures ANOVA

H1a / H1b: Age - ORB

To investigate if young individuals between 16 and 19 will be more inclined toward online risk behavior after exposure to doom-scrolling conditions and if those individuals tend to show greater values of ORB when exposed to dramatic news in social media, a within-subjects Repeated Measures ANOVA was performed. The repeated measures had only two levels, so Mauchly's sphericity assumption was verified. Conducting the test produced insignificant effects of age on online risk behavior ($F(1, 105) = 1.34$, $p = .25$) and no significant interaction effect of age and exposure to a specific type of news $F(1, 105) = 2.56$, $p = .08$. Thus, H1a and H2b could not be substantiated.

H2a / H2b: Gender - Self-esteem

For H2a and H2b, five participants were excluded from the analysis as the examination was based on males and females. To test if men would score higher on self-esteem than women after exposure to doom-scrolling conditions and to compare self-esteem levels between men and women when exposed to dramatic versus non-dramatic news, a between-subjects Repeated Measures ANOVA was conducted. The ANOVA showed no significant effect of gender on self-esteem ($F(1, 100) = 1.13$, $p = .29$) and an insignificant interaction effect between gender and exposure to a specific type of news on self-esteem ($F(1, 100) = 0.35$, $p = .70$), indicating a lack of gender-based differences in self-esteem.

H3a / H3b: Gender - Pessimism

As in H2, in H3, five participants were not considered because the hypothesis was formed according to male and female individuals. To explore if men will show higher pessimism levels than women after exposure to doom-scrolling conditions and to compare pessimism levels between men and women when exposed to dramatic versus non-dramatic news, a between-subjects Repeated Measures ANOVA was used. The repeated measures also had two levels in this test, and Mauchly's sphericity assumption was again verified. The last test showed an insignificant effect of gender on pessimism ($F(1, 100) = 1.09$, $p = .30$) and no significant interaction effect between gender and exposure to a specific type of news on pessimism ($F(1, 100) = 0.68$, $p = .51$). Therefore, by comparing non-doom-scrolling and doom-scrolling conditions, it was found that H3a and H3b could not be confirmed.

Discussion

This thesis explored the impact of doom scrolling through exposure to dramatic versus non-dramatic news. Specifically, it examined the potential influence of this type of news on online risk behavior, self-esteem, and pessimism among men and women and individuals aged 16-19. Despite the justifiable hypotheses and methodological approach, the

findings revealed no significant effects of age, gender, and type of news on the studied variables. Notably, when focusing exclusively on video-based dramatic news, a significant within-subjects and between-subjects effect on online risk behavior was observed for different age categories. Pessimism also produced a significant outcome when focusing entirely on pre-test and post-test measurements. This section discusses the reasons and limitations that generated those insignificant results and proposes suggestions for future research.

Reflection on Insignificant Outcomes

Several factors could explain those results. First, the pre-test and post-test measurements of online risk behavior (ORB) showed non-normal distributions and violated the assumption of homogeneity of variances. These statistical issues could have impacted the reliability of the results and generated inaccurate or misleading conclusions (FasterCapital, 2024). While violations of the normality assumptions are relatively robust against ANOVA (Ben-Shachar, 2024), homogeneity of variances, or sphericity, is another critical assumption for repeated measures of ANOVA. This assumption requires that the variances of the differences between all combinations of related groups are equal. Violations of this assumption can lead to a greater probability of biased outcomes of the F statistic (Lani, 2024). In this study, despite testing for Mauchly's sphericity assumption and finding it verified, the variances were not homogenous, particularly when analyzing the ratios for all groups of age and type of news on online risk behavior, gender, and type of news on self-esteem, and gender and type of news on pessimism.

Additionally, the relatively small sample size (n = 111), particularly within the 16-19 age group (n = 35), limited the study's power to detect significant effects (Lydersen, 2018). Also, some participants, especially adolescents who exhibit the highest level of dishonesty

(Staff, 2023), might have answered inaccurately due to the negative nature of the questions. This behavior possibly stems from the response bias that pervades people (Noori, 2023).

The exposure duration or intensity of doom-scrolling conditions might have been insufficient to elicit measurable changes in self-esteem. Recent research on news-seeking and emotional responses revealed that more exposure to the most recent headlines, whether through traditional news outlets or social media, can affect mental health (Huff, 2022). In addition, some participants likely possessed coping mechanisms or were resilient to negative news, which in turn reduced the impact of doom-scrolling (Cox, 2018).

Reflection on Stimuli Design

An important confounding factor may also yield to the structure of the stimulus design. Three versions of Facebook's homepage were designed to expose participants to doom-scrolling conditions. The researcher's initial perception reasoned this to find hypotheses based on different news types' impact on people. However, the inclusion of non-dramatic news in the stimulus design may have acted subversively on the measures of the dependent variables, considering the subtle effect they have on people's psychology (Timms, 2006). In contrast, videos elicit the highest rate of emotions on social networks (Little, 2024). Statistical tests also proved this by re-executing the Repeated Measures ANOVA and considering only the news that contained videos. According to the results, it can be seen that there is a statistically significant difference in online risk behavior (ORB) related to age in both within-subjects ($F(1, 49) = 5.59$, $p = .02$) and between-subjects comparisons ($F(1, 49) = 4.39$, $p = .04$). This means that young individuals are more likely to exhibit online risk behaviors when exposed to doom-scrolling conditions and are also more likely to behave this way than older people. Apart from ORB changes, it was also observed that there was a significant outcome for the within-subjects comparison of the pessimism's pre-test and post-

test measurements ($F(1, 45) = 5.13$, $p = .03$). Isolating the other two levels of "type of news," no significant difference was observed in any of the three dependent variables examined.

Reflection on Evaluation Constructs

Another study limitation might have been the adaptation of the constructs used for measuring online risk behavior, self-esteem, and pessimism. Specifically, the structure of the scale questions for online risk behavior was modified, and for pessimism, only the 10 most relevant questions were selected from the original 56-item scale. Furthermore, all three constructs were translated into Greek. Translating a survey's content to respondents' native language is crucial, as they are more likely to have a positive experience answering it (Cint, 2022). This is justified by the fact that 82 participants (73.9%) chose to carry out the survey in Greek.

The ORB questionnaire was initially designed to measure online cyberbullying perpetration. In this case, all questions encompassed the phrase "with intention to harm" at the end of every item. This part was excluded from the ORB scale, as it was considered an excessive and irrelevant expression for the construct, which was formulated to measure participants' ORB, particularly toward governmental entities and politicians. The rationale behind this execution is motivated by a general norm that requires researchers to be critical of the selection of standardized questionnaires, and if necessary, the questionnaire content should be customized accordingly (Sauro, 2016).

Despite modifications to the questionnaire structure resulting in good Cronbach's alpha values for ORB pre-test ($\alpha = .876$) and post-test ($\alpha = .911$) scales, which were used for the reported results, the attempt to improve the survey experience might have developed some problematic outcomes. It was observed that by removing the 15th item (*Pre-test Q15:* I have ignored someone's comments on social community online, *Post-test Q15:* I intend to ignore someone's comments on social community online) from both scales, alpha values

received a slight increase (pre-test α = .884, post-test α = .913). Considering those measures, Jamovi, in turn, produced a significant between-subjects effect for age ($F(1, 109) = 4.87$, $p = .03$), meaning that young individuals between 16 and 19 were more inclined toward online risk behavior after exposure to doom-scrolling conditions than people above 20. The other two hypotheses, though, could not be verified despite the negligible Chronbach's alpha increase in both self-esteem and pessimism scale after the testing the exclusion of some times. These indications suggest that while some modifications in the scales' content could have improved reliability, other factors, such as the translation of scales, may have led to the misinterpretation of survey questions and generated unintentional answers that do not reflect participants' true feelings. This arises when local language participants perceive questions differently in their language than what the researcher intended (Philomath Research, 2022).

Future Research

Several recommendations for future research are proposed to address the limitations and build upon the findings of this study. Future research should initially incorporate bigger sample sizes, particularly within specific age groups, to improve statistical power and generalizability (Cohen, 1988). Increasing sample sizes can also help achieve larger effect sizes and enhance the reliability of the findings (Ellis, 2010). Moreover, the duration and intensity of exposure to doom-scrolling settings may have a greater impact on online risk behavior, self-esteem, and pessimism. As reported above, more prolonged exposure will likely strongly influence participants' psychological states and behaviors (Huff, 2022).

Another crucial factor while executing experiments is establishing high experimental control. However, in this study, gathering participants in a controlled environment was challenging due to time constraints, and the data was collected through a convenience sample. Thus, future researchers should consider conducting experiments in more controlled environments that help isolate the effects of doom-scrolling and reduce the influence of

confounding variables. Higher experimental control will secure greater cognitive devotion and deter distraction, ensuring participants fully engage with the stimuli (Rodd, 2024). By implementing longitudinal designs, researchers can also monitor changes over time and ascertain the long-term impacts of doom-scrolling on online risk behavior, self-esteem, and pessimism. Repeatedly exposing people to scenarios of doom-scrolling stimuli can substantially impact their well-being and behavior (Buchanan et al., 2021).

Analyzing social media platform preferences revealed interesting insights into the participants' choices for news consumption. A significant portion of participants, 53 individuals (47.7%), indicated a preference for platforms other than the main ones traditionally studied. Specifically, 17 participants (15.3%) favored Instagram, and 11 (9.9%) preferred TikTok. Facebook emerged as the most utilized platform for news, with 47 participants (42.3%) selecting it. In contrast, only 11 participants (9.9%) chose X (formerly known as Twitter), which is notably lower than what might be expected based on existing literature.

These results imply that the social media news consumption landscape is changing, with consumers increasingly moving toward other platforms like Instagram and TikTok. This shift indicates that future studies should integrate a broader range of social media platforms into their stimulus designs should they focus on doom-scrolling research. Future research can better represent participant diversity preferences by including platforms such as Instagram and TikTok alongside Facebook and X and capture a more thorough picture of how various social media environments impact behavior and psychological effects. Integrating these platforms can improve the ecological validity of research by aligning experimental conditions with actual media consumption patterns (Musso et al., 2014). A potential stimulus design accompanied by this variety of social media platforms can be used to determine specific effects on traits like online risk behavior, self-esteem, pessimism, or others associated with

them. In that way, a more comprehensive and nuanced picture of how social media affects people's well-being will be feasible.

Future research should also consider using the latest and most dramatic news in their stimuli. This approach may significantly impact participants and better capture the effects of doom-scrolling on human well-being and behavior. Consequently, relevant questions about participants' intention to further doom-scrolling may be more reliable if used in another similar survey setting.

In conclusion, these results underline important factors for further investigation, even if the current study did not find any significant effects of age or gender on online risk behavior, self-esteem, and pessimism following exposure to doom-scrolling settings. Future research can contribute to the comprehensive understanding of the connections between digital media use and psychological consequences by tackling the identified constraints and integrating the proposed enhancements.

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Appendix A

Online Risk Behavior Assessment

5-point Scale: 1. Never 2. Rarely 3. Sometimes 4. Often 5. Very Often

SUB-SCALE	ITEMS
Verbal or written perpetration	**1. I have sent mean text messages on the mobile phone.** **2. I have said mean things on instant messenger or in chat rooms.** **3. I have sent mean emails.** **4. I have posted hurtful messages on Facebook or Twitter.** **5. I have attempted to send threatening statements via email or text message with intent to harm.** **6. I have never said mean things on instant messengers or inside rooms.** **7. I have spread rumors online.** **8. I have sent insulting online messages repeatedly.** **9. I have said mean things on websites repeatedly.**
Social exclusion perpetration	**10. I have blocked someone in a chat room.** **11. I have blocked someone on an instant messenger.** **12. I have rejected someone's request playing online games together.** **13. I have excluded someone from online community groups.** **14. I have never excluded someone from online group activities.** **15. I have ignored someone's comments on social community online**

Appendix B

Self-Esteem Assessment

5-point Scale: 1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

ITEMS
1. I feel that I am a person of worth, at least on an equal plane with others.
2. I feel that I have a number of good qualities.
3. All in all, I am inclined to feel that I am a failure.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself.
9. I certainly feel useless at times.
10. At times I think I am no good at all.

Appendix C

Pessimism assessment

5-point Scale: 1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

ITEMS
1. I feel like there's too much to do and not enough time.
2. I believe there’s not much hope for the human race.
3. I often expect things to get worse, even when they're okay.
4. I enjoy myself most when I am alone, away from other people.
5. As time goes on, things will most likely get worse.
6. It is easier to expect failure so it hurts less if it happens.
7. Everything changes so quickly these days that I often have trouble deciding which are the right rules to follow.
8. The future looks very depressing.
9. I generally look at the brighter side of life.
10. I often make things seem worse than they really are

Appendix D

Further Doom-scrolling

5-point Scale: 1. Definitely not 2. Probably Not 3. Might or might not 4. Probably yes

5. Definitely yes

Would you like to scroll and learn more about the events presented on this hypothetical Facebook homepage?

Appendix E

A preview of the survey used to gather the data. Both stimulus design and all questions are included.

https://tilburghumanities.eu.qualtrics.com/jfe/preview/previewId/b5ed9e75-c05f-4ac9-852a-7d347f1fbcf1/SV_5gt8nFVWeEqArVI?Q_CHL=preview&Q_SurveyVersionID=current