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**“Nightcore in Hyperborea: An Empirical Study of
Audiovisual Stimuli in Esoteric White Supremacist
Content on Social Media”**

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I dedicate this dissertation to my friend Ole. I would also like to thank Brianne, my family, and friends for their unwavering support, as well as my supervisor Dr Cheskin for his advice and feedback.

Abstract

The audiovisual design of propaganda on social media has been underexplored in the existing body of security studies research, despite the relevance of social media for the dissemination of said propaganda and the effects of audiovisual stimuli, which have been explored extensively in other disciplines. To fill this gap, this research investigated how the audiovisual design of esoteric white supremacist social media content, namely the Hyperborea meme format, affected the participants of an online experiment in a novel approach. Participants were exposed to one of four curated esoteric white supremacist posts, which varied in visual stimuli presentation rate and audio stimuli tempo, in a between-subjects design. Responses were recorded using a subsequent survey which also gathered relevant demographic data.

This research did not find any relevant significant effects of audiovisual design on emotional response or attitudes towards the content in the participants. However, these results are not conclusive as the study suffered from limited statistical power due to its small sample size of 113. Nonetheless, the results of the analysis brought forth valuable insights. These included higher exposure levels and increased positive responses to esoteric white supremacist content amongst male participants, while the majority of participants overall was unable to recognise this content as harmful. This research therefore provides a case study of a new approach to study extremist propaganda online, as well as relevant findings on algorithmic exposure and the ability of social media users to identify said propaganda.

Keywords: Esoteric White Supremacism, Audiovisual Stimuli, Social Media Propaganda, Hyperborea, Agartha, Vril

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1. Introduction

1.1 Background

At present, social media users come across seemingly endless varieties of content whilst scrolling on online platforms such as Instagram or TikTok. As one swipes past a video of a cat playing the piano or of a content creator trying all flavours of jellybeans, suddenly a video of a cartoon girl - in the style of Japanese Anime - dancing to a higher-pitched pop song appears. Behind the girl, one can identify the vague shape of a pyramid and a curious revolving symbol that resembles a wheel. Unbeknownst to many social media users, this inconspicuous post is not as harmless as it may seem. It is part of a popular *meme* (that is, an online joke format) about the mythical land of Hyperborea, thought to be located in the far north by the Ancient Greeks, which has become synonymous with a slew of conspiracy theories that claim it to be the birthplace of the “white race”. The meme gained notoriety for its use of sped up music and rapid succession of displayed images in *edits* - that is, short videos that are posted on social media sites such as Instagram, TikTok, and X.

At first, one might wonder how a joke about a conspiracy theory on the internet could have any meaningful security implications. It is, however, the perceived harmlessness of humorous extremist content on social media that makes its impact so unpredictable. It has been widely accepted that extremist elements have used modern forms of content on social media, such as memes, to disseminate their ideology. The ever-changing nature of internet culture allows radical ideology to adapt fast to and join emerging and existing internet trends, hiding their intentions under thinly veiled layers of colourful editing and popular music.

Nonetheless, these new propaganda formats have been significantly underexplored, which allows for a blind spot in content moderation and the prevention of radicalisation and polarisation. Terrorist attacks like the Christchurch and El Paso shootings highlighted the influence radical online communities can have on vulnerable individuals, with both attackers posting manifests on social media in which they reference racist conspiracy theories and fringe internet jokes (Lees et al. 2020).

Being influenced by the exposure to racist propaganda on social media is not exclusive to violent extremists, however. In an increasingly polarised political environment, European far-right politicians have openly used words such as “boreal” or “boreal word” (Vries 2019; Faure 2015), showing that language connected to racist ideologies can seep into popular discourse. In addition, a post by the far-right Austrian political party FPÖ Tirol, in which they use the

Hyperborea meme format, highlights that contemporary far-right parties knowingly or unknowingly use racist audiovisual meme formats in their campaigns (FPÖ Tirol 2025). How the exposure to these audiovisual formats affect social media users has surprisingly remained severely understudied. Moreover, the appeal for European far-right parties to utilise memes consisting of sped-up pop music and fast image presentation as a campaigning tool remains insufficiently examined by researchers.

To properly understand this phenomenon, understanding the psychological effects of audiovisual stimuli is key. This so far has not been considered by the field of security studies or integrated into a holistic research approach. While the effects of audiovisual stimuli have been documented extensively in other disciplines, research in the field of security studies has not drawn from these insights, despite its relevance in the study of propaganda.

1.2 Research Aims, Research Question, and Hypotheses

By studying the emotional and attitudinal response to the audiovisual design of esoteric white supremacist content, this study aims to identify which elements in the composition of propaganda content are effective in influencing user opinion and behaviours. Through the recording of emotional and attitudinal responses, additional insights can be gained into whether positive or negative perception of the content happens consciously or unconsciously. Furthermore, these observations may showcase whether participants are able to identify subversive propaganda content as harmful.

Thus, this research aims to examine how the audiovisual design of extremist propaganda content impacts social media users' emotional responses and attitudes - utilising a novel cross disciplinary approach that applies methodology from the field of psychology under a security studies lens. The subject, esoteric white supremacist content, was chosen for the study as not only has it been insufficiently researched but also due its characteristic audiovisual design that allows for effective analysis and recreation. Examining this understudied ideology in this new approach results in the following question that this research is designed to answer:

'Does exposure to audiovisual stimuli used in esoteric white supremacist posts affect the emotional response and attitudes towards the content of social media users?'

To provide an answer to the central research question, utilising the data collected from the experiment, the following hypotheses will be tested for:

Hypothesis 1 (hereafter referred to as H1): An increase in image presentation rate in the visual stimulus shows a negative correlation with feeling energised and excited.

Hypothesis 2 (hereafter referred to as H2): An increase in beats per minute in the audio stimulus shows a positive correlation with feeling energised and excited.

Hypothesis 3 (hereafter referred to as H3): An increase in image presentation rate in the visual stimulus shows a negative correlation with the identification of harmful content.

Hypothesis 4 (hereafter referred to as H4): An increase in beats per minute in the audio stimulus shows a negative correlation with the identification of harmful content.

Although this research focuses on one specific type of extremist content, the introduction of this approach can have wider implications for future studies on extremist propaganda on social media and how to identify them by characteristic audiovisual design, thereby informing better content moderation. Additionally, widening our understanding of how propaganda affects audiences psychologically with its audiovisual design could aid in educating and warning vulnerable groups about such content.

1.3 Structure

The following research paper will first establish a foundation of audiovisual propaganda on social media (Section 2.1), psychological effects of audiovisual stimuli (Section 2.2), and experimental studies on exposure to extremist online content (Section 2.3) in its literature review. In addition, the literature review will also outline the gaps present in the existing body of research as well as highlight the relevance of the contribution of this research for the study of audiovisual stimuli in extremist social media propaganda and of esoteric white supremacism (Sections 2.4 and 2.5). Successively, the method of data collection (Section 3.1) and findings of a qualitative content analysis of esoteric white supremacist content will be presented

(Sections 3.2 and 3.3). This will be followed by the methodology section in which this research paper outlines its experimental design (Sections 4.1, 4.2, and 4.3) as well as how the data will be collected and analysed statistically (Section 4.4). The results of the experiment conducted will then be discussed in a separate section (Section 5.1, 5.2, and 5.3), with the findings of the statistical analysis being critically evaluated in the context of this research's limitations (Section 5.4). This will be followed by the conclusion in which the contents of this paper and its findings will be summarised (Section 6.1), while also discussing the implications these findings have for the research question (Section 6.2), and providing possible directions for future research (Section 6.3).

2. Literature Review

2.1 Audiovisual Propaganda on Social Media

Our everyday life is shaped by what we see and what we hear. As we walk down a busy street, we may encounter a wide variety of visual stimuli that may differ in colour and shape or audio stimuli, like music, that can be discerned by its volume and pitch. The potential of these stimuli to elicit emotions has long been harnessed in the form of propaganda, where media is used by an entity to purposefully shape audience attitudes and opinions in the interest of a particular ideological or political goal. In the introduction to their book "Propaganda and Persuasion" Jowett and O'Donnell (2006) describe the concept as "a form of communication that attempts to achieve a response that furthers the desired intent of the propagandist". Or as Dauber and Winkler (2014) describe it, it is the practice of "directed persuasion". Throughout this paper propaganda, social media propaganda and extremist social media propaganda will be used interchangeably. Propaganda can vary significantly in its scope, medium, and subversiveness along with the way its message is disseminated: be it visual, textual, auditory or through speech acts. Throughout the twentieth century, significant resources were devoted towards the development and spread of propaganda by state and non-state actors in order to increase in-group morale during wartime or nationalistic fervour, but also offensively to spark division among their adversaries. Increasing access to devices such as the television and radio allowed Nazi Germany to broadcast speeches and wartime news directly to German households, highlighting the increasingly personalised and directed approach of propaganda tactics facilitated by evolving technologies (Saldern 2004).

Subsequently, the twenty-first century saw the introduction of personal computers and smartphones, which prompted an increase in attention directed towards digital screens by global audiences. Especially so, once social media platforms had solidified their position as a new means of communication in the online space.

For the purposes of this research paper, the following definition of social media will be employed: *social media describes a group of internet-based platforms on which users can engage with other users through various forms of communication such as messaging and content-sharing.*

Just as our life in the offline world, our experience of consuming content on social media is shaped by our exposure to audiovisual stimuli. Many social media platforms have added new features since their creation that became popular on other platforms such as ‘stories’ (that is, time-limited posts) or a video-based swipe mechanic, popularised by platforms such as but not limited to Musical.ly and TikTok. This development now allows users to publicly share audiovisual content on 9 out of the 10 biggest social media platforms by user numbers (Statista 2025).

The potential of social media as a propaganda outlet first gained widespread academic and popular media attention with the rise of Islamist terrorist groups such as AL-Qaeda and the so-called “Islamic State of Iraq and Syria” (more popularly referred to as ISIS) and their use of social media during the early 2000s and the 2010s to recruit new members (Awan 2017). The audiovisual content these groups disseminated was easily identifiable - through mediums such as brutal execution videos, religious chants, and vlogs (that is, video-blogs) of their fighters’ lives (Baele and Winter 2020).

This use of emerging forms of media as tools for propaganda highlights the concept of the “securitisation of everything”. According to securitisation theory, speech acts are used by one or more securitising entities to establish a threat, the mitigation of which justifies exigent measures (Buzan, Wæver, and Wilde 2022). Eroukhmanoff (2018) proposes that “an issue becomes securitised when an audience collectively agrees on the nature of the threat and supports taking extraordinary measures.”. As the newest iteration of a long line of media used for the dissemination of propaganda, social media has been effectively securitised, with decisionmakers calling for greater state control of content circulated on social media platforms and stricter content moderation (ABC News 2014; BBC 2015).

State and non-state actors have since embraced audiovisual propaganda on social media for political gain or to advance their policy goals domestically and internationally. However, modern iterations of propaganda being distributed on social media might not always be as easily identifiable as the content being disseminated by Islamist terrorist groups. Propagandists have increasingly adopted existing social media formats for their propaganda purposes to mask their messages and to make them easier to digest.



Figure 1. Classic depiction of *Pepe the Frog*. Matt Furie, 2005. BBC, 2016.

A popular social media content format which often takes audiovisual form is the meme. For the purposes of this study, memes will be defined as *content that is a duplicate of, or a variation of an original joke or humorous framework*. A popular example of this would be the Pepe the Frog meme, a caricature of a frog with human features, which has adopted a variety of different meanings over the course of its popularity ('Pepe the Frog' 2015). The existing body of literature shows that presently memes are being used on social media for propaganda purposes and that radical groups are using humour to make their ideologies seem more appealing to social media users within and outside of their organisations (Fielitz and Ahmed 2021; Rodríguez 2024). Humour can be an effective tool to disseminate an ideology as social media users have more positive attitudes towards extremist content that is entertaining at the same time (Frischlich 2021).

DeCook (2018) outlines how extremist organisations such as the far-right Proud Boys in the United States of America (hereafter referred to as U.S.) use meme formats to construct their identity through humour. Its members, consisting of mostly young men, do so by blending existing meme formats and visual cues that are familiar to a wider audience with their own ideology and symbols. One example of this would be the previously mentioned Pepe the Frog meme which DeCook (2018) encountered in her research combined with the “Don’t Tread on Me” flag, commonly used by fascists and sovereign citizens in the US. She subsequently acknowledges the use of memes on social media as “digital propaganda” (DeCook 2018). Her qualitative analysis of Proud Boys content provides interesting insights into the propaganda efforts of modern media savvy extremist groups. Limiting DeCook’s (2018) research, however, is the explicit focus on textual and visual cues only- disregarding the audio component of meme frameworks, possibly due to it predating the massive global success of TikTok and the adaption of the video-based swipe mechanic by many platforms. This does, however, highlight that while the field of social media propaganda has been securitised, this securitisation has not been based on a holistic approach. In other words, the development of propaganda content on social media is now not merely limited to its visual components but is presented in combination with auditory stimuli. Therefore, this research and its approach aim to address the current gaps in the research by adopting a more holistic view of the securitisation of social media.

A more recent study by Bösch and Divon (2024) acknowledges the significance of audio in propaganda on social media, especially in these video-based swipe formats. The research shows how TikTok’s “sound-centric algorithm” has enabled both sides of the war in Ukraine to spread propaganda content. This sound feature allows users to access sounds used in popular videos to create their own content, effectively allowing propagandists to hijack video trends connected to a certain audio. The initial meaning of the trend or the music used take second priority after its popularity in this effort, causing the identified propaganda videos to use audios ranging from World War 2 propaganda songs to Michael Jackson pop hits (Bösch and Divon 2024). It is apparent that in choosing both audio and visual stimuli used for propaganda memes on social media, familiarity to a wider audience and humour play a role to mask the contents actual message.

Despite these contributions, the literature on audiovisual online propaganda itself remains limited in several aspects. While it has been established in the existing literature that audiovisual propaganda has infiltrated its way into the online space and onto social media platforms, the research on this propaganda content has mostly been descriptive without

investigating its design through an experimental approach. Audio and video components of social media propaganda seem to have been chosen for a specific purpose by its creator- but what this purpose may be - the existing body of literature is unable to answer sufficiently. Furthermore, its coverage of different types of content has been limited in scope, arguably due to the vast structures of social media platforms. This research paper is therefore looking to conduct more comprehensive examination, covering an underexplored content format and the specific effects its audiovisual design has on audiences. How audio and video design can be used to affect emotion, cognition, and attitude formation will be explored in the following section.

2.2 Psychological Effects of Audiovisual Stimuli

Our reaction to audiovisual stimuli is often unconscious, intuitive, and is not something that we ponder on for too long. A painting can cause an audience to feel sadness and listening to an upbeat song can in turn make them happy, without any conscious mental processes being necessary. Investigating how and why audiovisual stimuli affect us has been the subject of an extensive body of psychological research.

In the review of the existing body of literature, it has become evident that while securitisation is supposedly a holistic concept and all-encompassing, the securitisation of social media does not include research on this topic. Understanding how the content that the majority of the world's population consumes every day, and how it shapes our emotions and opinions, is nevertheless integral to the development of effective security concepts for social media. This research having not been part of the field of security studies already is therefore a glaring oversight.

This research paper therefore draws from studies on physical exercise performance (Feiss et al. 2021), buying behaviours (Stewart and Koh 2017), and short-term memory enhancement (Chie and Karthigeyan 2009) to apply their findings in a security setting; thereby employing a novel approach in the study of social media security. In accordance with this paper's research objectives, this section will focus on the manipulation of audiovisual stimuli that have been applied in the meme formats this paper is looking to study, mainly speed of visual presentation, tempo, composition, and emotional connotation. Tempo, here, can be defined as beats per minute (BPM) - a purely mathematical measure of music speed, but also perceived speed or

how fast the music feels to the listener. This aspect can be affected by measures other than BPM, such as whether the music is played in minor or major key.

A study by Sotos et al. (2016) on music tempo presented participants with music ranging from 90 BPM to 150 BPM, after which the participants filled out a questionnaire with descriptive scales, recording their emotional responses. According to the findings of this experiment, higher BPM was associated with happiness while lower BPM was associated with sadness (Fernández-Sotos, Fernández-Caballero, and Latorre 2016). Similarly, a study by Yang et al. (2025) found that listening to music with up to 156 BPM displayed increased brain activity and arousal in participants in their Electroencephalogram (EEG) study. Medium levels of BPM (around 106 BPM) showed the least amount of brain activity, while slow music showed brain activity in regions connected to relaxation and calmness (Yang et al. 2025). These findings suggests that music tempo has a significant effect on elicitation of emotions and can be used to purposely evoke those emotions in a target audience. Furthermore, several studies have been conducted on the physical effects of music tempo, mainly in relation to physical strength and endurance exercises.

Typically, these studies measure heart rate and a rating of perceived exertion (RPE) with a common hypothesis being that an increase in tempo would cause an increase in heart rate and reduced levels of RPE in listeners during exercise. The findings of these studies vary drastically with some finding significant effects (Patania et al. 2020) and some not (Feiss et al. 2021) in the RPE measure. Variations in these findings can be explained by different choices in exercises employed in the study designs. Similarly, findings on music tempo effects on heart rate during rest differ as well (Bretherton, Deuchars, and Windsor 2019; van Dyck et al. 2017). Nonetheless, in studies where skin conductance was measured, faster music tempo showed a significant effect on arousal levels (Dillman Carpentier and and Potter 2007). Thus, it may be assumed that music tempo does have an effect of physical arousal - the full extent of which needs to be further explored as the current state of the literature is inconclusive - while the emotional effects of music tempo are supported across the literature.

Unfortunately, no research has been conducted on the emotional and physical effects of exposure to different music tempi on social media and how they affect the user's attitudes towards the content. In exploring this new research avenue, one can draw from relevant research conducted in the field of marketing on the effect of music tempo on brand perception and buying behaviours. Given the fact that propaganda is essentially a more radical form of advertising, this research provides valuable insights, and its findings may be transferrable to

research on propaganda content. For example, a set of studies conducted by Stewart and Koh (2017) in which participants were presented with advertisements containing audio stimuli at different tempi. After which, their emotional response and attitudes towards the brand were recorded. The findings indicated a significant effect of faster tempi evoking positive brand attitudes in participants that had previously not been familiar with the brand. However, this effect was weaker in participants that already had a strong emotional involvement with the brand (Stewart and Koh 2017).

Interestingly, a study by Hahn and Hwang (1999) found for a similar condition (low familiarity and fast music tempo) in their study on the effect of audio design in television advertising; that it was the least suitable to achieve increased message recall in audiences. The fast tempo and unfamiliar song seemed to overload the participants' ability to process the message in the advertisement effectively, leading to a decreased ability to recall that message. If audiences are familiar with the message, however, faster tempo music leads to better recognition of the message (Hahn and Hwang 1999).

These findings show that faster music tempo can elicit positive attitudes towards brands and allows audiences that are familiar with the advertised message to recognise it faster. Meanwhile, unfamiliar audiences might have issues recalling the advertised message under the same conditions. Applying these findings in a social media setting, it is reasonable to imply that faster music tempo can elicit positive emotions towards content that has seldomly or never been encountered before, while its message might not be recalled afterwards. On the other hand, social media users who have encountered similar content before should be able to recognise its message quicker.

Marketing research further elaborates on the effectiveness of pairing audio and visual stimuli in advertising, as introduced by Simmonds et al. (2020) who proposed that the use of audio-visual stimuli can increase audience attention. According to these findings, when processing multisensory cues, audiences draw from two separate pools of attention: auditory and visual, which increases message retention (Simmonds et al. 2020). They further highlight how audiovisual cues can be effectively used to guide audience attention towards specific parts of an advertisement. A framework which can of course also be applied to social media content. This is further supported by research by Gerdes et al. (2021), which showed that emotional audio stimuli can enhance audience's attention allocation when directing their eyes towards emotional visual stimuli.

Emotionally charged visual stimuli themselves have further been shown to be effective at eliciting strong emotional responses including physical reactions (Gunaratne et al. 2019). In a 2019 study by Gunaratne et al., participants exhibited significant self-reported emotional changes when exposed to traditionally positive and negative images - such as an infant and a snake. Additionally, the emotional reaction to these images showed significant changes in heart rate and caused participants to approach the screen when positive images were displayed, while retracting when negative images were displayed. Limiting this research is a relatively small number of participants - around 50 - that share similar academic and economic backgrounds. Its findings will nonetheless be considered here given the elementary nature of human emotional reaction to these images; most humans being cautious of snakes as an example. The findings of Gunaratne et al. (2019) highlight that the contents of visual stimuli can elicit positive or negative reactions with no additional context if they are commonly perceived as one or the other.

It is not only what a visual depicts, however, that is capable of eliciting human emotions, but also the way in which the visual stimulus is presented. One form of presentation that has attracted significant attention by researchers is called a Rapid Serial Visual Presentation (RSVP), an experimental framework in which participants are presented with large numbers of rapidly alternating visual stimuli. Numerous studies on RSVP have been conducted, among others, to test participants' short term memory capacity (Potter 2012), how much information they can process in a short amount of time (Lees et al. 2020), or whether stimuli can be hidden within the rapid stream of images (Smith et al. 2006). RSVP is especially interesting in the study of social media phenomenon, given the fast-paced presentation of visual stimuli inherent to the swipe and scroll mechanics and the fast-paced videography that can be observed in some audiovisual social media trends.

When initially presented with rapid presentation of visual stimuli, humans enter a state of alertness and reorientation to handle the sensory overload. As established by RSVP studies in which skin conductance or temperature was measured and showed immediate higher levels of conductance and changes in temperature (Smith et al. 2006; Gunaratne et al. 2019). Arousal increases throughout the duration of exposure to RSVP, implying that prolonged exposure can cause feelings of fatigue and irritation amongst participants (Smith et al. 2006). Within this state processing of emotional visual stimuli can still happen as normal, however.

A study by Smith et al. (2006) found that even if emotionally charged images were presented at rapid speeds of up to seven images per second, they still elicited significant emotional responses. In their work, they were investigating the effect of masking emotional stimuli in RSVP frameworks, presenting participants with alternating positive, neutral, and negative visual stimuli in rapid succession. Participants showed significant emotional responses, measured through blink responses and skin conductance, with neutral stimuli showing least emotional response and negative stimuli eliciting slightly stronger emotional responses than positive ones. These findings have been supported by research by Zhu et al. (2015) who found that emotional processing does happen in RSVP frameworks by measuring brain activity. They further confirmed that negatively connotated images elicit slightly stronger emotional reactions (Zhu et al. 2015).

Nonetheless, a study by Lees et al. (2020) highlighted the limits of human detection capabilities, at least for RSVP with neutral stimuli. In their research, participants were presented with words, numbers, and pictures at differing rates of up to 100 milliseconds per stimulus and were tasked with detecting target images. Results indicated that the presentation rate of images had a significant effect on participants' detection of target images. Additionally, the numbers stimuli showed significantly lower detection rates than pictures and words. A possible interpretation Lees et al. (2020) offers for this is that familiarity with the stimulus and perceived detection difficulty affects participants detection performance. When combining these findings with the findings of Smith et al. (2006) and Zhu et al. (2015), one can therefore make the reasonable assumption that in a RSVP setting, emotional visual stimuli elicit an emotional response even at high image presentation rates, while neutral unfamiliar stimuli are masked by the high presentation rates.

This section has highlighted how both visual and audio stimuli shape our emotional perception and that audiovisual stimuli can be designed to elicit specific psychological responses in an audience. Applying the findings of the existing literature in the design of social media content contours how audiovisual cues could be used for framing, priming, or to make use of heuristic processing (Mardhatilah et al. 2023). It is surprising that this topic has not been discussed in a security studies context considering the substantial attention given to social media as a security domain and medium for the dissemination of propaganda. This is not to say that there have been no experimental studies conducted on the exposure to extremist propaganda online as this will be further discussed in the following section.

2.3 Experimental Studies on Exposure to Extremist Online Content

Understanding the role of exposure to extremist social media content in the shaping of political opinion and radicalisation has been the subject of an extensive body of experimental research. Conducting this research brings with it several limitations, ethical roadblocks, and research design difficulties. How does one study the effect propaganda has on vulnerable audiences without endangering them in the context of an experimental framework? To answer this question, the following section will discuss the results of several studies, but also their methodologies. While it could be argued that this section, which informs the research design of this study could be placed in its own methodology sector, this section will attempt to connect the gaps in the existing research to the apparent lack of innovation in research methodology in security studies. By combining analyses of results and methodology, this section therefore both informs this study's research design, while also highlighting the shortcomings in scope and focus of the existing literature.

In order to mitigate the inherent ethical risks of research on propaganda, survey studies have been used to gather self-reported reaction data on natural or simulated encounters with easily identifiable radical content.

An example often referenced is a study by Pauwel and Schils (2016) that explored how exposure to violent extremist content correlates with political violence in Belgian youths. They used a social learning approach in the design of their study to understand how norms, regarding criminal behaviour, shift through increased interaction with violent extremist material. Data was collected through self-report measures, both online and analogue. While the sample size of 6020 participants is certainly large, the study is limited by its reliance on self-reported data and the leading wording of its questions. For instance, in the section on contact with radicals, the options are kept vague such as "How often did it happen to you that you came in contact with radicals in the last 12 months on a website where you made a personal profile?". At the time of the publication of this study, applications such as Instagram and Snapchat had already been released and were popular amongst the youths. Whether these applications are included as a part of this question is not entirely clear. Similarly, insufficient consideration was given to the fact that questions were worded incriminatingly, such as "Have you ever thrown stones at the police during a demonstration?". Such questions drafted in this way might not encourage honest answers, especially in analogue settings where the questionnaire is filled out by pen,

thereby possibly prompting participants to think that they might be under observation or could be identified by their own handwriting. Lastly, whether the participants were reliably able to identify extremist content was not considered in the design of the questionnaire by Pauwel and Schils. Their analysis of the collected data found a significant relation between seeking out extremist content and self-reported acts of political violence. These findings, however, should be evaluated carefully given the limitations of the study. Most of all, the paper by Pauwel and Schils (2016) highlights the importance of sufficient validity in the design of questionnaires and surveys when researching online extremism.

Schumann et al. (2024) similarly used a survey approach to assess the correlation between exposure to openly extremist content and favourable attitudes towards violent action. The focus of their study was the engagement behaviour of the participants, making the distinction between incidental exposure to and active seeking out of the content. Their findings indicate that incidental exposure does not correlate strongly with favourable attitudes towards violent extremist action (Schumann et al. 2024), while actively seeking out extremist content does (thereby, supporting the findings of Pauwel and Schils (2016)). Once again, this study had a large sample size but was limited by leading and vague wording in its survey design.

The findings of Pauwel and Schils (2016) and Schumann et al. (2024) indicate that incidental exposure to extremist content does not significantly increase positive attitudes towards extremism in audiences, unlike prolonged exposure which has been shown to desensitise audiences and increase tolerable thresholds of extremist content (Soral, Bilewicz, and Winiewski 2018). This is further supported by additional experimental research - like a study by Littler (2019) - in which participants were exposed to content of the 'English Defence League', a far-right extremist group, to test whether exposure would lead to an increase in support for radical violence with no significant effect being found. Similarly, Shortland et al. (2022) found no significant effect of incidental exposure in their study on personality traits as a predictor of attitudes towards extremist content. Critically though, in the analysis of studies employing the curated survey approach, one inevitably starts to question the reliability and validity of the experimental design and the produced results, providing for its limitations such as selection and self-report bias as well as its inherent lack of ecological validity.

Several studies have moved towards more innovative and ecologically valid designs in their study of exposure to extremist social media content such as studies by Braddock et al. (2024) on the mediating role of different content types in far-right extremist posts and their effects on audiences. Participants were exposed to extremist posts that included themes of "male

supremacy” and “scientific racism”, while also measuring their self-reported participation in subversive online activities (such as *trolling* and *doxxing*). The findings of these studies show a significant effect of increased participation in subversive online activities on positive attitudes towards extremist content (Braddock et al. 2024). This indicates that incidental exposure can significantly affect an audience’s opinions towards previously unknown extremist content if they exhibit specific online behaviours.

Some studies have even employed psychological methodology, mainly eye tracking, in their study of exposure to extremist social media content (Tomczyk, Pielmann, and Schmidt 2022; Heidarysafa et al. 2019). Most relevant to this research paper is a study conducted by Gorbacheva et al. (2021) which used eye-tracking to assess the effect of two different types of visual extremist content, memes, and what they referred to as “demotivators” (that is, simple image posts with a main slogan and descriptive text). Their findings suggest that demotivators cause higher mental processing load while memes showed lower levels of mental load probably due to their entertaining factor and familiarity; therefore, indicating that the social media format chosen to disseminate extremist content has a significant effect on message conveyance effectiveness (Gorbacheva et al. 2021). While these studies use psychological methods, their research analyses the effect of the content through visual cues only, without considering the way they might be presented to social media users or whether they are accompanied by audio stimuli. Given that the previous section of this research paper established the emotional effects of both audio and visual cues and the prevalence of audiovisual content on social media, the lack of consideration past mere visual cues limits the applicability of these findings.

Further studies have assessed the role of social media algorithms on focusing mainly on YouTube and finding no significant effects of algorithmic suggestion to radicalisation or political polarisation (Chen et al. 2023; Liu et al. 2025). No research on exposure to extremist content on platforms such as Instagram and TikTok, which present users with audiovisual stimuli at a faster pace and with increased variety, has been conducted at this time.

What crystalised itself during the review of literature on exposure to extremist social media content is that the field is severely understudied. This is highlighted by a meta-analysis of the U.S. Department of Justice on the role of social media on radicalisation, finding that the current research is inconclusive as to the effects of exposure to extremist content (Aryaeinejad and Scherer 2024). A meta-analysis by Wolfowicz et al. (2022) has further criticised the research design and biases in many of the existing studies, showing that experimental frameworks need to evolve to increase ecological validity and reliability (Wolfowicz, Hasisi, and Weisburd

2022). While some cross disciplinary research using psychological methods has been conducted, it has been limited in its scope and only investigated visual cues. Additionally, most of the existing research focuses on easily identifiable outwardly extremist content, leaving aside the subversive nature of contemporary extremist propaganda which might be difficult to detect by regular social media users. This is especially worrying given that a study by Reeve (2021) found that positive attitudes towards extremism are not necessarily an indicator of interaction behaviour. Meaning that, extremist content can be pushed in social media algorithms even without intention by its audience. Given the state of the current body of research, this paper is positioned to make an important contribution to advance the field by studying subversive extremist content while also employing a novel methodological approach.

2.4 Gaps in the Literature

The review of existing literature on audiovisual propaganda, the psychological effects of audiovisual stimuli, and experimental studies on exposure to extremist content highlights several gaps that this paper seeks to address. While the growing prevalence of audiovisual propaganda on social media platforms has been widely acknowledged, much of the current literature remains primarily descriptive in nature, offering classifications of extremist content or ideological analysis without thoroughly examining the mechanics of how these posts affect audiences psychologically or behaviourally. One significant shortcoming lies in the limited integration of psychological research into security-focused analyses of audiovisual propaganda. Conversely, the effect of audiovisual stimuli has been studied in the contexts of many other fields, such as sports studies and marketing, showing the potential for the research to be applied in cross disciplinary approaches. Nonetheless, the potential of audiovisual design to prime, frame, or otherwise influence viewers' emotional and cognitive states remains underexplored in security studies.

A second limitation is the methodological uniformity of most experimental studies on exposure to extremist social media propaganda. Many rely on survey-based designs that suffer from bias and operationalisation issues that result in limited ecological validity. While recent work has attempted to overcome some of these challenges through psychological methods like eye-tracking or more ecologically valid exposure frameworks, these efforts often focus only on visual stimuli and exclude the role of audio or audiovisual integration despite the fact that most contemporary social media content is inherently multisensory. Consequently, there remains a

lack of empirical evidence on how specific audiovisual configurations such as tempo and visual presentation rate shape audience emotional perception, engagement, or desensitisation in the context of extremist content.

Third, current experimental studies tend to concentrate on explicit or easily identifiable extremist content. This leaves more subversive and embedded forms of propaganda such as memes comparatively understudied. As it has been acknowledged that propagandists have increasingly adopted these formats, it is surprising that experimental research on propaganda memes has been neglected, leaving the current body of literature unable to answer how the design and affective appeal of such content may play a role in normalisation, radicalisation, or content virality.

Finally, platform specific frameworks have only been addressed sparingly, with YouTube being disproportionately represented in studies of algorithmic influence and exposure to propaganda content. Rapidly evolving platforms such as TikTok and Instagram, which prioritise short-form, audiovisual content, have not yet received the same analytical attention even though they may be more influential among younger and more vulnerable demographics. This disconnect between researchers and the reality of young social media users in the online space risks countermeasures to polarisation and radicalisation becoming inefficient and outdated before they are even implemented. Given these limitations, this paper aims to bridge disciplinary divides by combining insights from psychology and security research to examine how audiovisual design in extremist content affects viewers' emotional and attitudinal responses. In doing so, it hopes to contribute not only to theoretical understanding but also to practical considerations around content moderation and digital security policy.

2.5 Esoteric White Supremacism as Case Study

The online space is home to many iterations of various radical ideologies, some more recognisable, some less. Similarly, the ways they choose to disseminate their ideology through content on social media is just as varied. Analysing multiple types of ideological content far exceeds the scope of this study. To assess the effectiveness of a cross disciplinary approach in the analysis of radical online content using psychological methods and a security lens, an ideology was chosen that is often overlooked and is notorious for its characteristic social media content, esoteric white supremacism.

Esoteric white supremacism is not a new phenomenon and has been part of racist narratives since the 19th century (Fabre d'Olivet 1824). Unlike other forms of white supremacist ideology, it does not base itself on Darwinism to explain the supposed superiority of the 'white race' but rather opts for mystic explanations of ancestry and heritage to justify its hateful rhetoric. The ancestral home of the 'white race' in this ideology is often denoted to be the mythical territory of Hyperborea.

The idea of Hyperborea, literally describing its location past the north wind with its name, originated several hundred years before Christ according to mentions by Greek authors like Herodotus (Gagné 2021). Where exactly this territory is located is disputed among Roman and Greek authors of old, with various different proposed locations including the Kazakh steppe, northern Europe and Great Britain (Gagné 2021). Despite its location, often assumed as being far north of Greece and Rome, Hyperborea is described as utopia with mild temperatures, no illness and futuristic technology. The Hyperboreans themselves are described as favourites of the god Apollo and beautiful, intelligent creatures.

In the following centuries the narrative around Hyperborea joined the ranks of other "lost civilisations" like Thule and Atlantis and its name was mostly used as a placeholder for northern territories on maps. With the 19th century the study of Hyperborea saw renewed interest due to emerging movements in mysticism and the occult, the beliefs of which were often paired with racist connotations (Matveychev 2018). To establish the superiority of the "white race", race theorists tried to prove the descentance of white people from the mystical Hyperboreans. An example of this is a 1824 book, by the French author Antoine Fabre d'Olivet, on the history of humanity, describing Hyperborea to be located on the north pole and as the birthplace of the "white race" (Fabre d'Olivet 1824).

Later esoteric interpretations wove Hyperborea into a broader web of pseudoscientific and conspiratorial beliefs, including those associated with Aryan mythology (Allison 2024). One prominent thread links Hyperborea to the legend of Agartha, a hidden civilisation within the hollow earth. In his book "Beasts, Men and Gods" from 1922 Ferdynand Ossendowski describes Agarthans as beings of great technological sophistication with mysterious powers based on a form of energy called Vril (Ossendowski 2006). Some modern conspiracists suggest that Hyperborea either harboured the Agarthans after they fled their homeland or concealed the entrance to Agartha itself.

This narrative has since expanded wildly, incorporating elements like extraterrestrials, secret technologies hidden in pyramids, and antisemitic notions such as the so-called Jewish world order (Shnirelman 2014). Increased access to the internet has allowed this web of conspiracy theories to be disseminated online with mentions of Hyperborea first appearing on the notorious imageboard 4Chan as early as 2008 ('Desuarchive » Global Search » Searching for Posts That Contain "Hyperborea" and in Ascending Order.', n.d.). Since Hyperborea related content started being spread online it has taken various forms, for example in the form of humorous content such as *schizoposting* - that is content which ridicules the paranoia of conspiracy theorists. Humorous posts like these for instance promote the drinking of raw milk as it supposedly increases the consumers Vril capacity (Mike Florio's Burner [@FlorioBurner] 2025). More often than not however Hyperborea content is still used to promote white supremacy, fascism or other far-right ideologies.

This content gained notoriety for its overstimulating audiovisual design, using sped up pop songs and rapid presentation of visual stimuli, making it especially suited to be studied in the cross disciplinary approach of this research. When reviewing the existing body of literature, it became apparent that no research had been done so far on how this lesser-known racist ideology could become an internet phenomenon and how its content design facilitated it.

Existing research on esoteric white supremacism online is scarce, recent and mostly descriptive, with additional focus on ideological streams within the movement and its historical origins. Characterised for example by a chapter by Tuters (2020) in which the ideological influence of the racist philosopher Julius Evola on modern esoteric white supremacist discourse is discussed, which is then tied to the manifestos of white supremacist lone wolf terrorists. The insights this chapter provides are certainly interesting, but do not move past a superficial description of esoteric white supremacist content, disregarding in what form the perpetrators may have encountered it and how its design could have changed or reinforced their existing world view. This lack of engagement with the content itself as carrier of ideology underscores arguments previously made in this literature review on a disconnect between researchers and the realities of the online space.

A study by Maurer (2025) on the other hand engages more deeply with esoteric white supremacist and other conspiratory content. In his qualitative analysis of the mix of conspiracy theories and religion on social media he recognises the relevance of the online space for the dissemination of radical content and as a launch pad for new ideological offshoots. He discusses in-depth how meme formats are hijacked to disseminate esoteric white supremacist

ideology, providing detailed descriptions of several examples, even referring to the potential of audiovisual cues in far-right content to trigger associations (Maurer 2025). Nonetheless, Maurer (2025) does not further explore this potential, deducing supposed emotional effects of the content with no empirical backing. Additionally, he highlights the blurring of “intent and ironic engagement” in the interpretation of conspiratory meme formats, making it difficult to discern who is using them to disseminate an ideology and who is using them for personal amusement. This has meaningful implications for future research on effective content moderation to hinder the dissemination of these posts.

Supplementary research on esoteric white supremacy is again mostly descriptive and concerns itself mostly with ideological offshoots and themes of the movement. Among them accelerationism, the belief that the development of society will speed up so rapidly that it will ultimately lead to its demise, or racist ecologism, advocating for a return to an agricultural society, unprocessed food and living in harmony with nature but only for the “white people” (Paolini 2022; Tebaldi and Plum 2024). Across this existing research esoteric white supremacy has been established as radical ideology, being disseminated on social media through its characteristic content format, making it a suitable candidate for a pilot run of this study’s cross disciplinary approach. Furthermore, the existing body of literature on esoteric white supremacy online is surprisingly small given its significance as an online phenomenon, positioning this paper to make a valuable contribution to the research on this racist ideology. Drawing from this research, the insights it provides could then be applied to the study of other white supremacist ideologies that spread propaganda online, as well as to other extremist ideologies that are active in the online space. This in turn could equip platform administrators with the tools to implement more effective content moderation mechanisms.

3. Qualitative Content Analysis

3.1 Data Collection

Data for the content analysis was collected through TikTok with the intent to source authentic audiovisual content that has been disseminated through a video-based swipe mechanic. Other platforms, such as X and Instagram, were initially considered for data collection, especially X due to its advanced search feature. However, X advanced search does not allow searching for audiovisual content only and its platform mechanic was not based on a video-based swipe mechanic. Therefore, TikTok’s search mechanism was best suited for the task, due to the option

of looking for audiovisual posts within specific date ranges. Using TikTok limited the research in some ways, mostly due to the limited access to data on posts, such as average length, interaction data or even number of posts released within the time range. Furthermore, some difficulties were encountered in the search for specific keywords. For example, when searching for ‘Hyperborea’, users are not presented with content, but a warning message asking them to consult reliable sources on the Holocaust. The keywords used during data collection were therefore as follows; ‘Hyperborean’, ‘Vril’, and ‘Agartha’.

Despite these limitations, using TikTok’s search engine provided a good overview of contemporary esoteric white supremacist propaganda in audiovisual form. For each of the keywords, audiovisual content that had been posted in the timeframe 1st February 2025 to 1st May 2025 was collected and analysed, resulting in a sample size of around 410 posts. It can be reasonably assumed that the actual number of esoteric white supremacist content posted in this time range is many times larger but does not get detected by the search engine due to a lack of keywords in the title or the use of coded language. A new TikTok account was created for this data collection.

3.2 Analysis

The collected audiovisual content was examined based on three points of analysis; audiovisual design, materials, and messaging. The analysis of audiovisual design included attributes such as music genre choice, tempo, image presentation rate, and image transitions. In the category materials on the other hand specific images and audios used were documented. Under the message category audiovisual design and materials were then studied holistically to establish what message is being conveyed to the user and whether this message is subversive or obvious. The goal of this analysis was to identify common themes in these three categories across the collected audiovisual content, to inform the stimuli design for the experiment, to ensure the content shown to participants is as close to an authentic recreation as possible.

3.3 Findings

Generally, the collected posts were rather short, rarely exceeding one minute in length. However some more elaborate posts or compilations of posts could reach up to 10 minutes in length. The content found under the keywords was almost exclusively related to the meme

format this research is looking to study, with its composition outlined in the following sections based on the three points of analysis.

Audiovisual Design

The audiovisual design of the analysed content was dominated by themes of accelerationism. Accelerationism essentially represents the belief that through rapid technological development and societal change, modern capitalist society will inevitably collapse (Winston 2017). Visually this is characterised in the content by rapid streams of images and other visual stimuli, such as videos and symbols. These visuals are often brightly coloured and overlaid with distortion effects, making the visual stimuli difficult to identify at times. Some of the content draws heavily from the vaporwave aesthetic, an artistic movement which is known for its depiction of brightly coloured digital landscapes and often also includes themes of accelerationism. The use of this aesthetic by far-right extremists has been documented resulting in what some call “Fashwave” (Tuters 2020), which combines the design with far-right themes and symbols. Overall, though, the use of bright colours, distortion effects and RSVP seemed most defining in the visual design of the content, resulting in a surreal, overstimulating experience for the viewer.

These visuals are paired with similarly sped up audio, resembling the internet phenomenon of Nightcore music. Nightcore is a purely internet based cultural movement, which is characterised by music with high BPMs and pitched up voices, often being sped-up versions of pop or electronic dance music (Winston 2017). In Nightcore culture this music is often paired with ‘cute’ and Anime aesthetics, which contrasts the racist message of esoteric white supremacism. While technically any genre of music could be adapted into Nightcore format it was interesting that in the content the predominant genres were pop, ambient and electronic dance music. Music with far-right themes was not used once in the collected audiovisual content.

Generally, the overarching theme for the audiovisual design of esoteric white supremacist therefore seems to be accelerationist themes, characterised by RSVP and sped-up audio stimuli. This aligns with the description of the content that initially sparked the interest for this research and highlights how extremist propaganda can be (partly) defined by audiovisual design.

It should be noted that in the sample there was also content that exhibited a completely opposite audiovisual design, using decelerationist themes, like slowed-down music and slower visual

presentation rates, often paired with black and white imagery. This content often utilised classic white supremacist materials over esoteric components as will be outlined in the following section. While the accelerationist content made up most of the sample, investigating other audiovisual propaganda designs such as decelerationism should be a worthwhile endeavour for future research.

Materials

Since the analysed content often used RSVP the number of visual materials the content was composed of was staggering, as each rapidly presented stimulus was different from the next. Similarly, many different audios were used, not all of which could be listed here. This section will therefore only present the most prominent components of the analysed content, while still retaining a level of detail that allows for a proper understanding of the content's framework.

Starting with some of the more obvious visual elements, often shown in the analysed TikToks was Hyperborea and related conspiratory art. This includes depictions of the hollow earth or aliens building the pyramids but also specifically paintings of Hyperborea, of which most, such as “The Grandchildren of Perun: The Exodus of the Hyperboreans” were created by Russian artist Vsevolod Borisovich Ivanov (MacLugash 2016). His art features heavily across the analysed content and is arguably one of its most recognisable characteristics. This Hyperborea art is then often paired with identifying marks of fascist or white supremacist ideology.

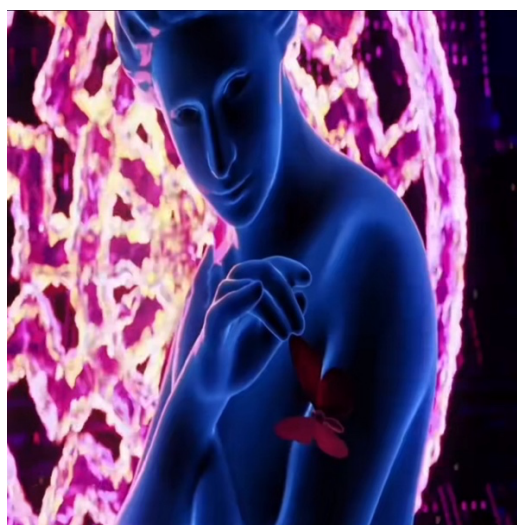


Figure 2. Example of *Fashwave* imagery with sun wheel variant as part of the background.

TikTok user “sxcerror”, n.d.. Keyword ‘Agartha’. TikTok, 2025.

Especially noticeable was the use of symbols across the content ranging from widely known white supremacist symbols such as the swastika, to lesser-known ones such as the black sun wheel and its various iterations. The black sun wheel especially was included in a large majority of sampled posts either front and centre or hidden in the background. Additionally, dynamic effects are often applied to the symbol to make it spin, following the previously established theme of accelerationism. The sun wheel was also represented in different iterations, with some creators opting for the use of sun wheel variations that represent specific regions or offshoot ideologies, such as the Slavic sun wheel.

The use of swastikas and SS-symbols on the other hand shows the proximity of white supremacist ideology and its esoteric counterpart in the online sphere, further underlined by the intermixing of their respective content. This type of content is the easiest to identify as outright harmful, including glorifying imagery of Nazi Germany, racist depictions of minorities and images portraying white “beauty” and “achievement”. Imagery of Nazi Germany often includes pictures and videos of Hitler himself, Nazi Propaganda materials and footage of World War 2. Content depicting white “beauty” and “achievement” includes everything from Roman and Greek antique buildings and statues to footage of white models and athletes. Such content can be especially helpful in identifying the creator’s chosen iteration of esoteric white supremacism. Depending on the creator’s definition of which “type” of white people (e.g. Anglo-Saxon, Nordic, Slavic) originates from Hyperborea these depictions show regional differences, for example by primarily using paintings of specific regional origin. This is also the type of content most prevalent in the decelerationism themed posts of the sample.



Figure 3. Example depiction of white “beauty and “achievement” as image of a roman statue overlaid with the image of a young white female in a white dress. TikTok user “Ark”, n.d..

Keyword ‘Hyperborean’. TikTok, 2025.

While the use of white supremacist materials might make the content easier to identify as harmful, the analysed TikToks also made use of other meme formats and trends that are popular on social media, diluting the visual ideological elements of the content. This can really include anything, such as the Pepe the Frog meme mentioned previously, but also dancing cats or excerpts from popular TV-shows.

Drawing from Nightcore culture, this also includes the use of Anime aesthetic, mostly in the form of female Anime characters in ‘cute’ or ‘provocative’ outfits. Lastly, additional content that was sometimes wedged between the more ideological visuals, were themes that are usually associated with traditional depictions of masculinity, such as fast cars or glorifying images of guns and soldiers.



Figure 4. Example depiction of Anime character with sun wheel and a version of the Nazi Reichkriegsflagge. TikTok user “Fräulein HMMIM 🍷🌲”, n.d.. Keyword ‘Hyperborean’.

TikTok, 2025.

In the analysed content the different types of visual materials identified were often intermixed, seemingly at random, but the exact composition of audiovisual stimuli allows us to gain insights into the message the content’s creator might have been looking to convey. These visuals were then paired with the aforementioned sped-up pop or EDM music, with some notable examples being a remix of “Down Under” by Luude, in which the land down under does not refer to Australia but Agartha, as well as songs like “All the things she said” by t.A.T.u or “l’Amour Tojours” by Gigi d’Agostino.

Message

As evident in the outline of the materials prevalent in the analysed content, different compositions of visual and audio elements were utilised to disseminate different types of messages. Among the different ideological messages, some iterations of the content did not seem to include a message at all, having been created as purely ironic mockery of the meme framework, while others have used the format to further their commercial interests. The sample included posts in which non-fungible tokens (NFTs) and cryptocurrencies were promoted, usually loosely linked to Hyperborea or Agartha in name. Moving past the ironic and the commercial, the sample included a slur of different far-right ideologies, ranging from the original esoteric white supremacist outlook of the content to Nazism and Anarchism.

The messaging in this ideological content was sometimes very open, with calls to “Save Europe!” but in other cases very subversive with the occasional black sun wheel appearing in backgrounds of beautiful landscapes. Interestingly, scrolling through the content felt like moving down the rabbit hole, with each iteration of subversive content preparing the viewer for the next post with the ideological alignment becoming increasingly open as one moves along. The “tamest” iterations create notions of white supremacy purely by combining audio and visual elements that are unrelated to esoteric white supremacism, such as landscapes, Greek and Roman statues, footage of white athletes, and so on. On the next level these images are combined with depictions of Hyperborea and Agartha, which in and of itself do not seem harmful to the unknowing viewer. Moving further down the rabbit hole, the first symbols appear, notably the black sun wheel, alongside stronger conspiratory themes, for example images hinting at Jewish cabals. Only when passing beyond this level does the content include more obvious traces of extremist ideology, like UFOs with Nazi and Wehrmacht symbols plastered on the side, until the content design finally culminates in positive depictions of Nazi Germany. Remarkably, while the visual elements change as one traverses through this rabbit hole the choice of audios remains the same. Esoteric white supremacist messaging therefore exists across the content at different levels of subversiveness, with some content easier to identify as extremist than others.

4. Methodology

4.1 Study Design Overview

This study utilised a between-subjects experimental design to investigate the effect of audiovisual design on user responses to esoteric white supremacist content on social media. The experiment was conducted online using PsychoPy software and hosted through Pavlovia. The primary aim was to assess how variations in audiovisual elements, specifically music tempo (BPM) and the rate of visual stimulus presentation influence emotional response and attitudes toward the content. Participants were randomly assigned to one of four experimental conditions, each featuring a different combination of auditory and visual presentation parameters. This approach enabled an examination of the causal effects of these design features while minimising potential confounding variables. All participants were recruited through advertisements on social media and were required to be at least 18 years old to participate. The

study was approved by the ethics board of the School of Social Sciences at the University of Glasgow.

4.2 Stimuli Development

Based on the findings of the qualitative analysis of esoteric white supremacist content on TikTok (see 3.3) four conditions were created with visual presentation rate and music speed varying across the different iterations. For the fast image rate and music conditions this study drew from the themes of Accelerationism that were established to be a key component in the qualitative content analysis.

The audio and visual design of the stimuli was centred around the beat-drop of the chosen song, after which the songs vocal elements stop playing and only the underlying beat is audible. In the analysis this was found to be a very popular segment in the design of the content the stimuli are based on. The first visual segment of the stimuli was the same for all conditions up until said beat-drop. This segment was around 24 seconds long with 30 visual elements being displayed amounting to a presentation rate of 1.25 visual elements per second. As the beat dropped, image presentation rate started to differ between the two conditions, leading to the following overall visual presentation rates. For the sped up visual presentation conditions 60 elements were presented in 35:14 seconds resulting in an image presentation rate of around 0.59 elements per second. For the slow image presentation conditions on the other hand 37 elements were presented in 35:23 seconds, resulting in an image presentation rate of around 0.95 elements per second. The additional images in the sped-up conditions cover the same themes as the 37 images all conditions share, adding nothing new in terms of content.

Unlike the visual conditions, the audio conditions differed from the beginning of the stimulus presentation with the slow condition being played at 140 BPM and the sped-up condition being played at 167 BPM. While the BPM of the slow condition is already quite high, speeding the song up to 167 BPM achieves the Nightcore audio effect with pitched up voices.

As for materials and messaging, a moderately subversive version of the content was chosen, which at closer inspection is identifiable as extremist content but ambiguous enough to not be recognised as such by unknowing eyes. This level of subversiveness was chosen to retain the focus on the audiovisual design, without participants identifying the content too easily or not at all, which could alter their responses. This meant inclusion of esoteric white supremacist symbols such as the black sun wheel but also inclusion of unrelated imagery such as fast cars,

rocket ships and Vikings, to make the visuals of the stimuli more appealing to male audiences. Visuals were sorted to create a narrative which was similarly observed in the analysed TikTok content, for example by sequencing images of a DNA strand, blue eyes and a blonde woman in quick succession, evoking themes of genetic Arianism. Also included were depictions of Hyperborea, often paired with a black sun wheel in the background, some AI-generated and some being the originals by Vsevolod Borisovich Ivanov.



Figure 5. *The Exodus of the Hyperboreans* by Vsevolod Borisovich Ivanov, which was used in the stimuli. Vsevolod Borisovich Ivanov, 2006. WikiArt, 2013

Further materials included visuals like a fast-spinning earth, purely to evoke Accelerationist themes and Fashwave imagery. To create the content typical distortion effects, filters such as “colour glitch” and “spooky camera” were overlaid over the images in the video editing software CapCut.

As audio, the song “Kiss Me Again” by French artist Pakito was chosen, which also had a widely available Nightcore version for the fast conditions. The audio was chosen due to its popularity in the content format, having come across it multiple times over the course of the content analysis, but also because it can be found on YouTube on the channel “Aryan Classic”. The song itself and the artist who produced it are not associated with white supremacy, highlighting how the movement hijacks popular songs for its purposes.

4.3 Experimental Design

Participants

Participants were recruited using online advertisements on social media, mainly on the platform Reddit. By using Reddit this research aimed to recruit mostly residents of Ireland and the UK, as the language used to guide participants through the experiment was English. Advertisements were therefore posted in regional communities, so-called Subreddits. Among these were large Subreddits with several hundreds of thousands of members, such as r/Scotland, but also smaller, local ones, mainly university related, such as r/UCL. Other, non-European English-speaking communities were not advertised to, to retain a focus on European security. By utilising the framework of a social media platform, it was effectively ensured that most participants would be social media users, thereby increasing the ecological validity of this research. The final sample size amounted to 113 participants, with 93 actively using Instagram and 71 actively using other social media. Overall, of 111 participants that reported active social media use 102 either actively used Instagram, another type of social media or both.

Of the samples' participants 63 were female and 44 were male, with 6 reporting other genders or not reporting gender at all. Female participants were notably overrepresented, which could be partly explained by the advertisement on university communities, given that women are overrepresented in British higher education (Hewitt 2020).

Participants had to indicate that they were at least 18 when they acknowledged the consent form, however my ability to confirm this was limited given that age was self-reported. The age composition of the sample was fairly young, with 14 participants in the age group 18-21, 73 participants in the age group 22-29, and 13 participants in the age group 30-39, with participants over 40 only accounting for 12 participants. Again, the overrepresentation of young participants can be explained by advertising on social media, specifically in university communities.

Similarly, participants with self-reported politically left stances on social issues were overrepresented as well, which can be attributed to recruitment through university Subreddits and the majority of the sample being female, with current demographic trends showing stronger political leanings towards the left in young women (Adam McDonnell 2024). Overall, 31 participants identified as 'Left', 45 as 'Centre Left', 10 as 'Centre', 15 as 'Centre Right' and

only 3 as 'Right'. Of the 113 participants 9 did not provide information on their political leanings.

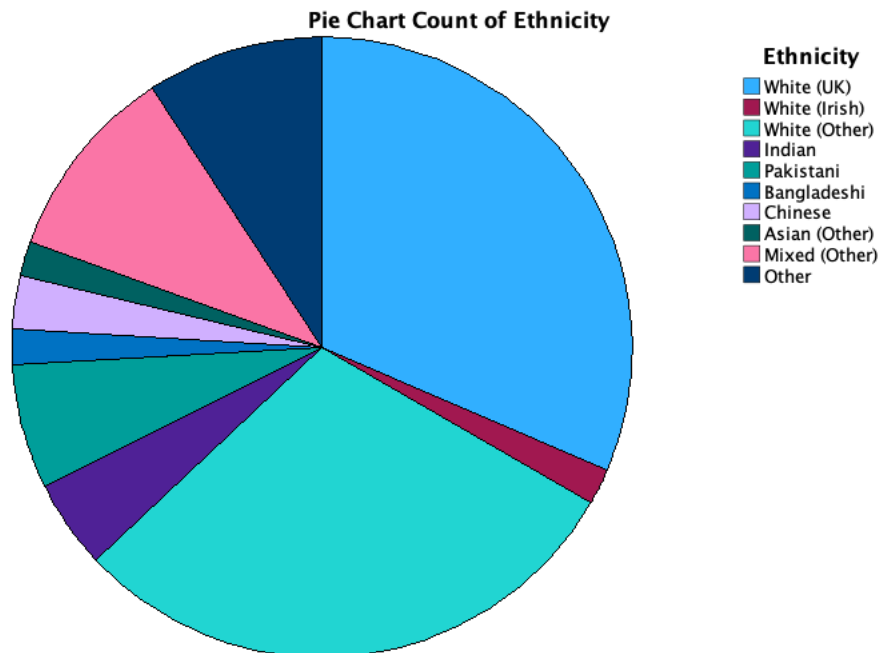


Figure 6. Pie Chart of ethnicity distribution in the sample. *Source: Author*

The majority of participants identified as white, including the categories 'White (UK)', 'White (Irish)' and 'White (Other)' accounting for a total of 68 participants, or 63% of the sample. The second largest group was 'Mixed (Other)' with 11 participants, followed by 'Other' with 10. Asian ethnicities made up the rest of the sample with a total of 19 participants, including 'Indian' (5), 'Pakistani' (7), 'Bangladeshi' (2), and 'Chinese' (3), as well as 'Asian (Other)' (2). Among British minorities, 'African' and 'Black British' ethnicities, as well as others, such as 'Roma' were not represented in the sample, decreasing its ecological validity. While the study of white participants was important for this research, given that they are the target demographic for esoteric white supremacist content, it is just as important to analyse how participants belonging to minorities are affected by the content. This shortcoming should be remedied in future studies with larger more diverse samples.

Design

A 2 by 2 between-subjects design was used to evaluate the impact of audiovisual stimulus features on participants' emotional and attitudinal responses to esoteric white supremacist content. A between-subjects approach was chosen over a within-subjects one, to control for order effects, reduce the time it would take the participants to complete the study and avoid prolonged exposure to potentially harmful content.

Participants were randomly assigned to one of four conditions, each comprising a unique stimulus combining different levels of music tempo (low and high BPM) and visual presentation rate (slow or rapid image presentation). Through random assignment this research aimed to control for individual differences and mitigate selection bias. To further reduce demand characteristics and obtain more authentic responses, a mild form of deception was employed. Participants were informed that they would be shown one of 100 randomly selected Instagram Reels, when in fact they were randomly assigned to view one of four specifically designed experimental stimuli. The stimuli design was adjusted accordingly to avoid exposing participants to overtly harmful content, such as depictions of violence.

Each participant was exposed to only one stimulus, ensuring that their responses were not influenced by repeated exposure or carryover effects. Following stimulus exposure, participants completed a post-exposure survey designed to capture both affective and attitudinal responses to the content. A survey was used despite the limitations outlined in Section 2.3, as the processing of other forms of response measurement, such as written responses would have exceeded the resources of this study. The stimuli were presented via PsychoPy and hosted online through Pavlovia, allowing for consistent delivery across devices.

Materials

The experiment was created using PsychoPy (v2024.2.4) and Pavlovia survey software, with the survey's having been integrated into the PsychoPy experiment, which was then hosted on Pavlovia's online hosting servers. PsychoPy (Peirce et al. 2024) is a python-based software which is used to design and conduct behavioural experiments. PsychoPy has been designed specifically for psychological research and has been optimised to allow for the conducting of online experiments through Pavlovia. On the website Pavlovia (Peirce et al. 2024) researchers

can conduct and share experiments and create and conduct surveys. Pavlovia was used under a license acquired by the University of Glasgow.

The experiment employed two Pavlovia surveys, one to present participants with consent form, privacy notice and participant information sheet and one to collect the participants self-reported response to the stimuli, also presenting them with the debrief form. Stimuli presentation used PsychoPy software and Java coding to adjust the experiment for being hosted on Pavlovia's servers. Through coding, presentation of stimuli was randomised and recorded for each participant. Responses were automatically saved on Pavlovia as csv. File.

Stimuli were created using CapCut (Bytedance 2019) software, a free to use video editing tool. Images, videos and audios were predominantly sourced from copyright free image sites such as Unsplash (Chesser et al. 2013) or created using ChatGPT (OpenAI 2024). Further images were included that are characteristic to the format of the stimuli and do fall under copyright, but their use was necessary to authentically recreate the researched content. The use of these images falls within the parameters of the UK's laws on fair use in academia. The audio used in the stimuli was used with explicit permission from the sound's original creator. The ease of access to the materials necessary to create the stimuli highlights the low threshold at which social media users can participate in the sharing of their own versions of the researched content. No additional hardware other than the participants own laptop, personal computer or smartphone was required to complete the study. The size of text and audiovisual stimuli were automatically adjusted to fit the participant's screen. Responses were given by the participants either through the pressing of keys on their keyboard or by tapping on their screen.

Procedure

Once participants opened the experiment through the link in a web browser of their choice they were presented with the participant information sheet, privacy notice and consent form, which they had to acknowledge in that order to continue through the experiment. They were then presented with the pre-stimulus screen which informed them that they would be presented with their Instagram Reel as soon as they clicked or tapped on the screen. Stimulus presentation started immediately upon tapping or clicking on the screen, followed by automatic continuation to the survey part of the experiment, recording the participant's responses. After the participant had filled out the survey they were presented with the debrief form concluding the experiment.

Measures

The survey completed by the participants after the presentation of the stimulus measures emotional response, attitudes towards the content and self-reported interaction behaviour, as well as relevant demographic information. These four categories are reflected in the structure of the survey in Pavlovia, with one page covering one category respectively.

Emotional response was measured on the first page, with six questions. Participants were asked to indicate on a rating scale how strongly they felt certain emotions ('Happy', 'Energized', 'Excited', 'Anxious', 'Exhausted', 'Sad'). The rating scale ranged from one to seven, with seven being the strongest. The six emotions were answered individually, but were split into two groups of three, with the first three emotions having a positive connotation ('Happy', 'Energized', 'Excited') and the latter three having a negative connotation ('Anxious', 'Exhausted', 'Sad'). Questions were grouped by emotion to avoid potential priming effects. Through these questions this study aims to assess if image display rate and music speed affect the emotional state of the participants by eliciting a significant positive or negative emotional response.

The second page collected responses related to the participants' attitudes towards the content of the stimuli presented to them. Participants were presented with four Likert scale questions with seven options, of which each represented two opposites, namely interesting-boring, funny-unfunny, engaging-unengaging, harmless-harmful. Answers ranged from strong attitudinal responses at the poles ('Very Interesting- Very Boring') to indifference in the middle ('Neither Interesting, Nor Boring'). With this the study collected data on whether image display rate and music speed affect the participants ability to identify the content as potentially harmful and if they enjoyed being presented with it.

On the third page social media use and theoretical interaction behaviour with the content was recorded. Participants were asked whether they actively used Instagram and how long they spent on the application per day, with options ranging from '30 minutes' to 'More than three hours'. The same question was asked about other social media like TikTok and X in one question to avoid repetitiveness. The subsequent question inquired how often participants had encountered similar content before, with answers ranging from 'Never' to 'Often', with additional specifications in brackets outlining specific time frames (like '1-2 a week'). Participants were then asked whether they would like, share or comment on this reel inn three Likert scale questions with options ranging from 'Very Likely' to 'Very Unlikely'. This data

was collected with the intent of comparing interaction behaviour and previous exposure to the content among different demographics and different levels of social media use.

For this the last page recorded demographic information with inclusive questions on age, gender and ethnicity, following UK non-discriminatory standards. Additionally, participants were asked to place themselves on a simplified political scale on social issues ranging from 'Left' to 'Right' to assess whether political views had a significant effect on response and exposure to the stimuli.

4.4 Data Analysis

The data was analysed using IBM SPSS statistics version 29.0.2.0, under the license of the University of Glasgow. Data was transferred by hand from Pavlovia string outputs in individual .csv files per participant, to collective .csv and .sav files. The analysis examined the effects of the audiovisual design of esoteric white supremacist content on participants' emotional responses and attitudes toward the content as well as how these outcomes varied across demographic factors. Additional expanded analyses were conducted on demographic trends, exposure to similar content and interaction behaviour.

First, computed variables were created for emotional response by averaging items into two composite scores: 'PositiveEmotion', which included the values of 'Happy', 'Energized', and 'Excited' divided by three and 'NegativeEmotion', which included the values of 'Anxious', 'Exhausted', and 'Sad'. These were analysed alongside the individual emotional response metrics.

The scales recording the attitudes of the participants towards the content were analysed individually while also being combined into a composite score 'Attitudes', which was composed of the values of 'Interesting', 'Funny', and 'Engaging'. The scale 'Harmless' was analysed only individually, as important metric regarding the participants' ability to recognise the content as harmful.

Conditions were initially coded using a single categorical variable 'Stimuli', reflecting the 2 by 2 between-subjects design based on music speed and image presentation rate. These were then recoded into two binary variables 'MusicSpeed' and 'ImageRate'. To assess the direct effects of the audiovisual conditions on emotional response and attitudes, two-way Analysis of

Variance (ANOVA) was conducted using the binary condition variables, to account for interaction effects.

For analysis of demographic influences, independent-samples *t*-tests were used for binary variables such as gender, and one-way ANOVAs were applied for categorical variables like ethnicity. Crosstabulations (with Chi-square tests) were employed to explore associations between categorical demographic variables, for example 'Gender' and 'Politics'. Descriptive statistics, including frequencies, means, and standard deviations, were used to summarise participant characteristics such as gender distribution, age range, and ethnic composition. To evaluate potential exposure to similar content and likelihood of engagement through the variables 'Like', 'Comment', and 'Share', additional ANOVAs, *t*-tests, and correlation analyses were run against both demographic and experimental variables. All variables were checked for missing data and normality before analysis. Where applicable, post-hoc tests, for example Tukey HSD were applied to identify group differences. Significance was assessed at the $p < .05$ level

5. Results & Discussion

5.1 Emotional Response to Audiovisual Stimuli

Of the 113 participants, all gave answers for the emotional metric scales. Mean values across all individual metrics and the composite variables were relatively low, with all $M < 4$ for the 7-point scale. Values for the individual positive metrics were similar across the scales with 'Happy' $M = 2.83$ $SD = 1.603$, 'Energized' $M = 3.65$ $SD = 1.963$, and 'Excited' $M = 3.04$ $SD = 1.770$, resulting in the composite scale 'PositiveEmotion' $M = 3.177$ $SD = 1.58$. For the individual negative emotional scales, values were 'Anxious' $M = 3.30$ $SD = 1.986$, 'Exhausted' $M = 3.17$ $SD = 2.039$, and 'Sad' $M = 1.84$ $SD = 1.272$, which when combined in the composite scale 'NegativeEmotion' $M = 2.77$ $SD = 1.315$. While most of these means hover around the lower end of the midpoint of the scale, the mean for the scale 'Sad' seems to be particularly low at $M = 1.84$. Paired with its low standard deviation when compared to the other scales, meaning that most values for this scale were close to the mean it can therefore be hypothesized that the content itself regardless of audiovisual condition did not evoke strong feelings of sadness in the participants. The responses for the scale 'Energized' on the other hand had the highest mean at $M = 3.65$, and while this, at first sight, might suggest that the audiovisual

design across the conditions caused the participants to feel energised, the high standard deviation of the scale implies that further analysis is necessary.

Generally, the standard deviations for the emotional response scales are relatively high, with some $SD > 1.0$ and some even at $SD > 1.5$ and $SD > 2.0$, indicating a high degree of variance. To assess how much of this variance in the emotional responses can be explained by the condition participants were assigned to, a two-way ANOVA was conducted for each emotional response metric using the binary variables 'ImageRate' and 'MusicSpeed'.

The results of these ANOVAs were not significant for the majority of emotional metrics across the different conditions, the only exceptions being the effect of 'MusicSpeed' on 'Anxious' ('ImageRate' $p = 0.490$ 'MusicSpeed' $p = 0.008$ Interaction $p = 0.503$) and 'NegativeEmotion' ('ImageRate' $p = 0.902$ 'MusicSpeed' $p = 0.016$ Interaction $p = 0.438$). However, most of the variance explained by 'MusicSpeed' for 'NegativeEmotion' can be attributed to 'Anxious', with both 'Exhausted' ('ImageRate' $p = 0.465$ 'MusicSpeed' $p = 0.200$ Interaction $p = 0.433$) and 'Sad' ('ImageRate' $p = 0.622$ 'MusicSpeed' $p = 0.191$ Interaction $p = 0.929$) not showing any significant results.

Looking at the results for 'Anxious' closer, the overall model showed to be statistically significant $F(3,109) = 2.742, p = 0.47$, implying that the factors explained a significant tranche of variance in 'Anxious' scores. The actual effect size and amount of variance explained by this model is rather small at $R^2 = .070$ (adjusted $R^2 = .045$), however. 'MusicSpeed' had a significant effect, $F(1,109) = 7.198, p = 0.008$ indicating that the speed of music significantly affected self-reported anxiety levels in participants. No significant effect for 'ImageRate', $F(1,109) = 0.479, p = 0.490$ or the interaction between the two binary variables, $F(1,109) = 0.451, p = 0.503$ was found on the other hand.

The results for 'Anxious' seemingly support what has been established in previous literature, that is that variations in BPM can have a significant emotional effect on humans. To understand how these results relate to $H2$, that hypothesised an increase in 'Energized' and 'Excited', further examination of the correlation between 'MusicSpeed' and 'Anxious' was necessary. An additional independent samples t-test was conducted to understand the direction of the correlation between the two.

In the t-test, Levene's Test for Equality of Variances did not present a significant result, $F(1,111) = 0.300, p = 0.585$, showing that the assumption of equal variances was met. The test further confirmed the significance of the effect of 'MusicSpeed' on anxiety levels, $t(111) = -$

2.712, $p = 0.008$ (Two-Sided). Participants in conditions with higher BPM reported significantly higher anxiety scores compared to those in conditions with lower BPM. The mean difference between high BPM and low BPM groups was -0,986 (SE = 0.364), with a 95% confidence interval of [-1.706, -0.266].

Given that none of the ANOVAs of the individual positive emotional scales indicated a significant effect, with neither 'Happy' ('ImageRate' $p = 0.786$ 'MusicSpeed' $p = 0.695$ Interaction $p = 0.578$), 'Energized' ('ImageRate' $p = 0.101$ 'MusicSpeed' $p = 0.503$ Interaction $p = 0.774$), 'Excited' ('ImageRate' $p = 0.250$ 'MusicSpeed' $p = 0.452$ Interaction $p = 0.604$), nor the composite scale 'PositiveEmotion' ('MusicSpeed' $p = 0.491$ 'ImageRate' $p = 0.231$ Interaction $p = 0.909$) reporting a p -value < 0.05 , these results seemingly disprove both *H1* and *H2*.

Not only that, but the scores of 'Anxious' implicate the opposite of *H2*, that higher BPM are not positively related with feelings of excitement and energy but rather feelings of anxiety. This would contradict the findings of Yang et al. (2025) or Fernández-Sotos et al. (2016) with most of the literature finding positive emotional effects of increased music tempo.

Based on the small effect size of the two-way ANOVA conducted for 'Anxious' and suspecting, that the reported anxiety levels are related to the actual content of the stimuli and not to their audiovisual design, I tested if 'MusicSpeed' retained its significant effect when controlling for other variables. Another two-way ANOVA was conducted with 'Anxious' as dependent, this time with the factors 'MusicSpeed' and 'Harmless', to indicate the participants attitudes towards the content.

The results of this analysis showed that 'MusicSpeed' did no longer explain a significant amount of variance in anxiety scores when controlling for 'Harmless' scores. The scores of 'Harmless' explained a significant portion of variance in 'Anxious' $F(6,99) = 2.502$, $p = 0.27$. The model itself was also significant at $F(13,99) = 2.260$, $p = 0.012$ and explained a substantially higher amount of variance than the 'Anxious' model at $R^2 = 0.229$ (adjusted $R^2 = 0.128$). This indicates that their impression of whether the content was harmless or not shaped participants reported anxiety levels regardless of music speed. It can therefore not be assumed that these results support the opposite of *H2*. It rather seems as if music speed and image presentation rate in the audiovisual design of esoteric white supremacist propaganda do not influence the emotional response of participants at all, which in turn would contradict the

findings of the existing literature that reported significant emotional effects of music speed and image presentation rates (Yang et al. 2025; Fernández-Sotos et al. 2016; Gunaratne et al. 2019).

While general non-significance is certainly one plausible explanation for these results, two alternative explanations shall be offered here. First, the emotional scales are rather simple both in variety and size. A 7-point scale might not accurately reflect the depth of human emotion, some participants might not have felt like they could accurately report their emotions this way. Furthermore, the six options of emotional scales are broad and could be expanded upon with additional scales reflecting more specific and diverse emotions. Second, the results of the two-way ANOVA correcting for ‘Harmless’, indicates that some participants were aware of the nature of the content and altered their answers accordingly, regardless of what audiovisual condition they were exposed too.

This is especially concerning given that most participants indicated that their positions were closer towards the politically left, ergo if a participant with a politically left background encountered far-right propaganda content they might always report feelings of anxiety. To explore this the effect of political affiliation on emotional response was examined using several one-way ANOVAs, with all $p > 0.05$ and none reporting a significant result. Effect sizes for the demographic variable were small to moderate, with all Eta-squared values < 0.075 . Even though some of these effect sizes are moderate, the non-significant results imply that they, statistically speaking, could have occurred by chance. It is questionable however whether these results actually imply that political affiliation has no effect on the emotional response to exposure to esoteric white supremacist content online. As stated in Section 4.3, in the sample participants with liberal views on societal issues were strongly overrepresented. The small sample size of conservative participants therefore puts any results of this statistical analysis in question. Taking this into consideration when interpreting the effect sizes, it could also mean that the moderate values represent an effect that is unable to be detected with statistical significance, due to the small sample size.

To better understand how political affiliation affects variance in self-reported emotional responses to esoteric white supremacist content further research with more balanced samples needs to be conducted. Especially interesting here would have been the category ‘Right’ to see if it would respond more favourably to the content. Looking at the scores for ‘Right’ on ‘Anxious’ for example, shows that the scores of the 3 participants in that category are spread out across the scale (1, 3, 6), providing no relevant insights.

While the skewedness in political affiliation was quite glaring, the demographic factor of 'Gender' was more balanced, although female participants were still overrepresented in the sample. The effect of gender on emotional response was explored using an independent samples t-test. The analysis was conducted only for male and female participants, excluding the 'Other' and 'Prefer not to say' categories. For two of the emotional scales a significant effect was found. Of the positive emotions this was 'Happy' at $F(1,105) = 0.049$, $p = 0.826$, with $t(105) = -2.243$, $p = 0.027$ and the 95% confidence interval $[-1.291, -0.080]$. Male participants reported higher happiness levels across all conditions when compared to female participants. The mean difference between groups was -0.685.

For 'Anxious' on the other hand, the opposite was the case. There was a significant difference between the two groups at $F(1,105) = 4.984$, $p = 0.028$, with $t(103.74) = 2.783$, $p = .006$ and the 95% confidence interval $[0.295, 1.756]$. However, for 'Anxious' female participants reported higher levels across all conditions when compared to their male counterparts. The mean difference between groups here was 1.026. The composite variable 'NegativeEmotion' was also significant, with 'PositiveEmotion' close to significance, which can be attributed to the significance of 'Happy' and 'Anxious'. Further one-way ANOVAs for 'Happy' and 'Anxious' were conducted, confirming the significant results, with moderate effect sizes respectively ('Happy' Eta-squared = 0.046, 'Anxious' Eta-squared = 0.063).

These results imply that male participants responded more positively emotionally to the content, while female participants responded comparatively more negatively. Looking at the design of the esoteric white supremacist content created for this study in combination with these results, one can then infer that the design is more appealing to male audiences. The design that was used for this study featured symbols and concepts that are traditionally associated with masculinity, like Greek style male statues, Vikings and sports cars. This might have raised happiness levels in male participants, while reducing anxiety levels, while that type of content did not appeal to female participants. Additional research on individual content elements of this type of stimuli is necessary to further interpret this result. For now, it can be deduced though that study was successful in creating stimuli that are more appealing to its male participants.

The same cannot be said for appeal to different age groups. One-way ANOVAs were conducted for all individual and composite emotional response scales and age with none yielding a significant result. Only 'Anxious' approached significance at $p = 0.088$. Again, this can be partly explained by shortcomings in the sample, with almost 78% of the sample being under the age of 30, the responses of this young group of participants dominated the data. Sample sizes for older demographics were too small to make any meaningful deductions. While the underrepresentation of older generations is a shortcoming, even more substantial of one is the lack of representation from even younger generations. This study was limited by its age requirement of 18 and over, while social media users younger than that might be the ones most exposed and most at risk in the context of these propaganda formats. This is an interesting angle that should be explored by future research, keeping in mind the ethical implications of exposing minors to harmful content.

Lastly, when running one-way ANOVAs on the effect of ethnicity on emotional response, one gets similar results, with no significant difference between different ethnic groups when answering the questionnaire. Again, the samples composition puts these results in doubt, with lacking representation for some ethnic groups and very small sample sizes for others.

Overall, in the analysis of the emotional response scales, few significant results were found, which is surprising, as one would expect stronger emotional reactions when exposed to extremist propaganda. Especially political affiliation and gender were expected to be stronger predictors of emotional reaction, which was not or only partly confirmed by the results. It is however important to stress that the design of the content overall seems to be more appealing to men, which confirms that within a meme framework propaganda can be tailored towards specific target groups. This hints at how well suited this type of format is for the dissemination of ideology, once more underlining that further exploration of it is urgently necessary. Unfortunately based on the research design no deductions can be made in regard to what specific elements of the content make it appealing to male audiences, if this appeal is created through some of the more ideological visual aspects for example or non-related once like sportscars.

Despite the important insights this analysis has provided on the role of gender in the emotional perception of esoteric white supremacist propaganda, its results do not support the hypotheses it was testing for. Neither music speed, nor image presentation rate had a significant effect on participants' responses according to the gathered data. Therefore, $H1$ and $H2$ can be rejected in accordance with these results. As these findings contradict contemporary findings on the

emotional effect of music speed and image rate however (Yang et al. 2025; Fernández-Sotos et al. 2016; Gunaratne et al. 2019), the research design and sample composition had to be critically examined to better place the results of this research in the current discussion on the effects of audiovisual stimuli.

A strong case can be made for the simplicity and small size of the emotional response section explaining the lack of the significant results and an even stronger one can be made for the small sample size explaining it instead. Nonetheless, the significant results that were found warrant the call for additional research, to explore the emotional impact of exposure to extremist propaganda, using a more refined and improved version of the novel approach of this study.

5.2 Attitudes towards Content and Ability to Identify it as Harmful

All 113 participants recorded their attitudes towards the content through the scales on the second page of the survey. Unlike the emotional scales the positive pole of the attitude scales was situated at 1, meaning a higher value in the following means indicates a more negative response on average. The means were all found close to the midpoint of their respective scale at 4, with ‘Interesting’ $M = 4.45$ $SD = 1.852$, ‘Funny’ $M = 4.89$ $SD = 1.606$, ‘Engaging’ $M = 4.29$ $SD = 1.725$, and ‘Harmless’ $M = 3.44$ $SD = 1.631$. The composite scale of ‘Attitude’ came in at $M = 4.55$ $SD = 1.45$. Again, the standard deviations were in the moderate to high range, hinting at a high degree of variance, the explanation of which will be the focus of this analysis. Interestingly, the mean value for ‘Harmless’ was the lowest across the attitude scale, implying that on average participants were not able to identify the content as harmful. This allows for the reasonable assumption that the research design was successful in exposing participants to a type of extremist propaganda that was ambiguous enough to not be immediately categorised as such by participants. Looking at the means only, this seems to be true despite participants on average harbouring more negative attitudes towards the content.

How much of the variance in these scores can be attributed to the exposures to the different conditions, however? Two-way ANOVAs were conducted for all individual and the composite attitude scale using the binary condition variables ‘MusicSpeed’ and ‘ImageRate’. The results of this analysis found no significant effect of the binary variables on the variance reported in the attitude scales. Despite this the overall model for the scale ‘Interesting’ showed to be significant at $F(3,109) = 2.976$ $p = 0.035$. Looking closer at the reported results, the values for ‘ImageRate’ ($p = 0.056$) and the interaction between ‘MusicSpeed’ and ‘ImageRate’ ($p =$

0.051) approached significance. Effect size was relatively small at $R^2 = .076$ (adjusted $R^2 = .050$) but did indicate that this model explained a significant amount of variance in 'Interesting', therefore warranting further investigation. A line plot was created to conduct additional analysis of the interaction effect between the two binary variables (Figure 7). In the plot the two lines crossed, suggesting an interaction effect and allowing for the following interpretation: a faster image presentation rate increases interest when paired with the slower music condition, but this effect disappears if both music speed and image rate are fast. A similar interaction effect approaching significance was found for the variable 'Engaging' ($p = 0.52$) but the overall model was not significant at $F(3,109) = 1.714$ $p = 0.168$, which paired with its low effect size $R^2 = .045$ (adjusted $R^2 = .019$) did not warrant further investigation. Nonetheless, further studies with more power should investigate these effects to clarify these ambiguous results.

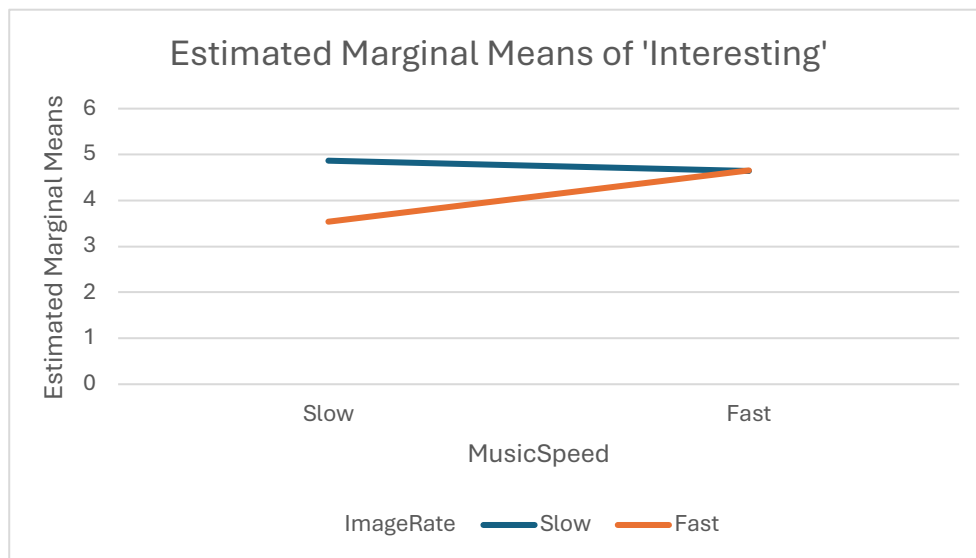


Figure 7. Line plot of interaction effect between music speed and image presentation rate.

Source: Author.

The model for the scale 'Harmless' did not show a significant result at $F(3,109) = 0.830$ $p = 0.480$, despite its overall lower mean when compared to the other attitude scale, it can therefore be inferred that participants classified the content as less harmful on average, regardless of condition. This stands in direct contrast to $H3$ and $H4$, which stated that higher music speed and faster image presentation rate would negatively impact the ability of the participants to identify the content as harmless. In line with the findings of (Stewart and Koh 2017) and (Lees et al. 2020) I expected faster image presentation to make identification of themes in the stimuli

more difficult while increased music tempo would lead to stronger positive responses, thereby reducing levels of reported harmfulness, this however, was not supported by the outcome of the statistical analysis.

Akin to Section 5.1, several reasons can be brought forward here relating to the research design and sample size to challenge these results. As outlined in Section 4.2 the base version of the audio stimulus used in the conditions already had high BPM, the effect of music speed on the ability to identify harmful content might have been researched more accurately using additional levels of music speed with greater differences between each level. In the analysis of the literature, researchers often employed a three-level design with variations of up to 50 BPM between the levels, while the difference between levels in this study only amounted to 27 BPM. Similar issues can be brought forth for the visual stimuli presentation rate conditions. Additionally, it would have been worthwhile to add a scale on which participants could have recorded how fast they perceived the audio and visual stimuli to be. This does not mean that the non-significant results of this study should be disregarded but rather that further exploration of the method and the subject matter is necessary.

Even if the main effects did not show a significant effect on the attitudinal scales, their standard deviation hinted at substantial variance in the means, which, following the ANOVAs for the main effects, was explored across the demographic factors. In Section 5.1 it was established that ‘Harmless’ explained significant amounts of variance in the emotional ‘Anxious’ scale and it was hypothesised that this might be connected to political affiliation. While no significant effect of political affiliation on the emotional scales was found, another round of one-way ANOVAs was conducted on the attitudinal scales.

Of these, one was significant, the scale ‘Interesting’ at $F(4,99) = 2.680$, $p = 0.036$ with an effect size of $\text{Eta-squared} = 0.098$, while neither ‘Funny’ ($F(4,99) = 1.069$, $p = .376$), ‘Engaging’ ($F(4,99) = 1.734$, $p = .149$), nor ‘Harmless’ ($F(4,99) = 1.758$, $p = 0.143$) showed a significant effect. The ANOVA for the composite variable ‘Attitude’ came close to significance at $F(4,99) = 2.453$, $p = 0.051$, which can be attributed to the significant result of ‘Interesting’. Post-hoc tests were run for the significant scale to examine how participants’ results differed according to their political affiliation. By conducting a Tukey HSD post hoc analysis, I found that the only significant difference between groups was between ‘Left’ (1) and ‘Centre-Left’ (2) with ‘Left’ ranking the content as less interesting than ‘Centre-Left’ at $p = 0.05$. The mean difference between the two groups was 1.196 with a confidence interval of [0.00, 2.39]. This does therefore somewhat support the hypothesis made in Section 5.1, that

participants who identified themselves as politically left would have more adverse reactions to the content. While it seems unlikely that politically centre-left social media users would find esoteric white supremacist propaganda interesting, this finding cannot just be discarded, even if it is at the border of traditional statistical significance with $p = 0.05$ exact. When looking at the means for the different political affiliations on the interesting scale an interesting observation can be made, as seen in Figure 8.

Politics	Mean	N	Std. Deviation
Left	5.13	31	1.962
Centre-Left	3.93	45	1.789
Centre	5.40	10	1.506
Centre-Right	4.27	15	1.710
Right	4.00	3	3.000
Total	4.48	104	1.900

Figure 8. Table of mean scores on the scale ‘Interesting’ split by political leaning.

Source: Author.

Out of all political affiliations ‘Centre-Left’ reported the lowest score on the scale at 3.93, meaning the highest level of interest across the groups, while ‘Centre’ showed the least amount of interest at 5.4. Given the values of the means, one would therefore expect more significant results from this analysis. When looking at the sizes of the different groups of political affiliations it became clear that ‘Centre-Left’ also had the most statistical power, while other groups were limited by their small sample sizes and their high standard error. The skewedness in the sample thus arguably caused the lack of further relevant results. As for the difference between ‘Left’ and ‘Centre-Left’, several considerations can be made as to why a significant result was found here. First, the structure of the scale might have unintentionally influenced participants. The word “interesting” might not have been perceived by some participants as being a variable that categorises the content into positive or negative. Finding something

interesting that one does not agree with is not inherently contradictory. Additionally, the scales might have been designed to narrow as seven-point Likert scale, with broader scales might have reflected attitudes more accurately. Lastly, given the high p-value, the outcome could have also just come down to chance.

While all these considerations are hypothetical what has crystalised itself throughout this analysis is the insufficiency of the sample size and composition of this study, which will be further explored in the analysis of the remaining demographic variables.

The effect of Gender on the outcomes of the attitudinal scales was analysed using an independent samples t-test, with no significant results reported across the scales. This analysis not reporting any significant results at all was surprising, given that the previous analysis of gender and its effect on the individual emotional scales found two significant effects. What the author would have expected here is a difference between male and female participants, with male participants finding the content more appealing due to its design. This poses the question of do male participants report higher happiness levels in response to the content when compared to their female counterparts, without finding the content interesting or engaging? These results might indicate that the processing of some of the content's design elements might happen unconsciously, causing higher happiness levels in male participants without conscious identification of what caused such feelings. This research failed to properly analyse the effect of these elements on the participants' mood, mostly due to the limitations that came with conducting it online. Additional research could include recording of brainwave activity or skin conductance levels as outlined in some of the existing literature (Yang et al. 2025; Dillman Carpentier and and Potter 2007) to record unconscious processing parallel to the exposure to the stimuli.

Like gender, no significant effect of age on the participants' response to the attitudinal scale was found. One-way ANOVAs were conducted for the individual scales, as well as the composite scale, to explore the effect of age on the outcomes. Again, statistical power for the groups of participants over the age of 30 was so low due to the small sample size that no significant results were expected or found. The same methodology was used to test for the effect of ethnicity on the scores, with none being significant. The same concerns that were voiced about the sample composition as in Section 5.1 could be reiterated here.

Overall, the results of the analysis of the attitudinal scales culminate in the preliminary dismissal of *H3* and *H4*, as the contents audiovisual design did not seem to affect participants

in a meaningful way. However, this section also outlined several issues with the stimuli and research design of this study, giving reason to doubt the validity of its results. The main takeaway this data provided was that the score for the scale ‘Harmless’ was the lowest among the attitudinal scales. As seen in figure 9, 53 participants, or 46.9% of the sample, classified the content as harmless.

	Frequency	Percent	Cumulative Percent
Very Harmless	16	14.2	14.2
Harmless	26	23.0	37.2
Slightly Harmless	11	9.7	46.9
Neither Harmless, Nor harmful	23	20.4	67.3
Slightly Harmful	28	24.8	92.0
Harmful	7	6.2	98.2
Very Harmful	2	1.8	100.0
Total	113	100.0	

Figure 9. Table of score frequencies for the ‘Harmless’ scale. *Source: Author.*

This has severe security implications for content moderation on social media platforms, given that almost half of all participants or more than half if one counts the ‘Neither Harmless, Nor Harmful’ category failed to categorise the content as harmful. If content moderation is done by humans, they would therefore need to be specifically trained to recognise this type of content. Furthermore, additional efforts are necessary to inform UK and European social media users about different types of harmful propaganda content, as the current average understanding of these types of content seems to be lacking. These results alone justify further research building and improving on the novel approach this study employed.

5.3 Further Points of Analysis

As established in Section 5.1 and 5.2 the analysis of the main effects of audio stimuli speed and visual stimuli presentation rate on the emotional and attitudinal responses of the participants did not bring forth any major significant effects. However, as outlined in Section 4.3, further data outside of the emotional and attitudinal sections were collected, namely on theoretical interaction behaviour and previous exposure to esoteric white supremacist content. The following section will first conduct additional analyses of sample composition and sample trends, after which the interaction behaviour and previous exposure will be discussed.

Several issues have been outlined throughout this paper regarding the samples' size and composition, nonetheless it was considered it worthwhile to run additional tests to see if any trends could be found within it. Possible trends that the author expected to find included but were not limited to female participants reporting themselves more often as politically left when compared to male participants and older participants reporting themselves as more politically right when compared to younger participants. Of the participants 99 gave information on political affiliation as well as falling under the gender categories 'Male' (39) and 'Female' (60). To assess how gender affected political affiliation in the sample, an independent samples t-test was conducted which found a significant difference between genders with $t(97) = -2.207$, $p = 0.030$ (Two-Sided), equal variances assumed. The mean difference between male and female was -0.49, with a 95% confidence interval of [-0.93, -0.05], indicating that women on average reported a lower score on the scale, meaning they reported themselves as being more politically left.

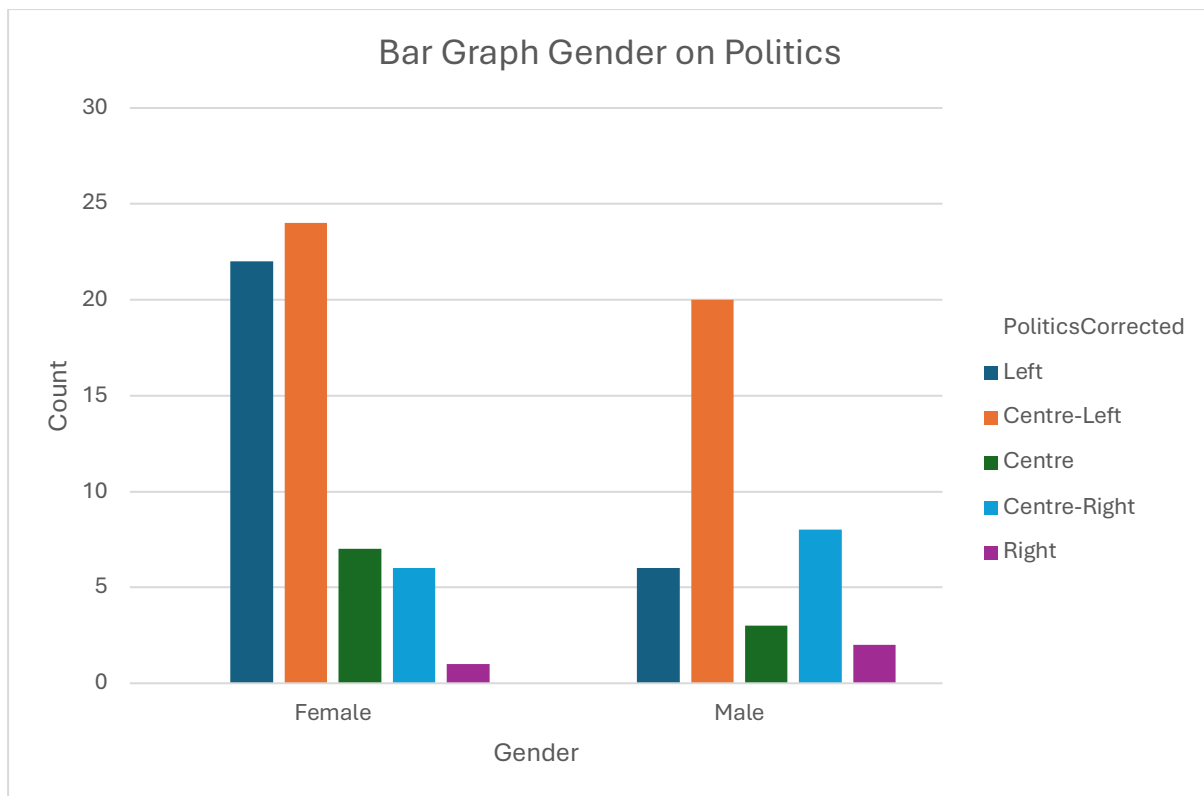


Figure 10. Bar graph of political leaning sample distribution, split by gender. *Source: Author.*

This is visualised in the bar graph in Figure 10 which shows the political affiliation of participants split by gender. Interestingly the largest difference in affiliation was for the category ‘Left’. Of the female participants 37% identified with the ‘Left’ category while only 15% of males did. On the other hand, 26% of males identified with the categories ‘Centre-Right’ (8) and ‘Right’ (2), while only 12% of females did (‘Centre-Right’ (6) and ‘Right’ (1)). This supports contemporary demographic trends as reported in a survey on voting behaviours in the 2024 UK elections (Adam McDonnell 2024). This finding can be considered relevant as they have been established previously by other studies with larger sample sizes.

Unlike gender, age and ethnicity did not seem to affect participants political affiliation. Two one-way ANOVAs were run to assess the effects of these variables on self-reported political leaning, with neither showing a significant effect. As mentioned earlier though sample size and sample skewedness discredit these results.

With gender having the most reliable sample composition out of the demographic variables, additional investigation of trends was done. Two independent samples t-tests did not find any significant difference in active usage of Instagram and other social media between the genders.

Additional analysis of social media use however showed that female participants spent more time on social media than their male counterparts with a mean difference of 0.38 as revealed by a t-test with $t(77) = 2.44$, $p = .017$ (Two-Sided), equal variances assumed. This was surprisingly not true for Instagram use where no significant difference between the means of male and female participants was found.

How these demographics, as well as the participants response to the audiovisual conditions correlate with the participants' previous exposure to similar content was the focus of several additional analyses. Of the 113 participants 112 provided information about their previous exposure rates, with 24 reporting that they had 'Never' encountered the content, 25 reporting 'Rarely', 37 reporting 'Occasionally', 14 reporting 'Frequently' and 12 reporting 'Often'. Therefore, 88 participants or around 79% of the sample had encountered similar content before showing high exposure saturation levels.

One-way ANOVAs were run for all emotional and attitudinal individual and composite response scales to assess whether previous exposure had affected participants response. Two contrasting outcomes were hypothesised, one being that higher exposure rates would have caused desensitisation in participants, therefore leading to stronger positive responses to the stimuli, and the other being that previous encounters made participants realise the nature of the content, therefore reacting more negatively to it. For the positive emotions both 'Happy' ($p = 0.002$) and 'Excited' ($p = 0.003$), as well as the compositive variable 'PositiveEmotion' ($p = 0.005$) were found to be significantly affected by different levels of previous exposure. Post-hoc Tukey HSD tests revealed a significant difference between the groups 'Never' and 'Occasionally' for 'Happy', with participants in the 'Occasionally' group reporting significantly higher happiness levels than participants in the group 'Never' at a mean difference of 1.33. Similarly, for 'Excited' participants who had encountered the content 'Occasionally' ($p = 0.009$) or 'Often' ($p = 0.032$) showed significantly higher levels of excitement than participants who had 'Never' encountered the content, however participants who encountered the content 'Often' were also more excited than participants who encountered it 'Frequently' ($p = 0.039$). For the composite scale only the differences between 'Never' and 'Often'/'Frequently' were significant. Additionally, two-way ANOVAs were conducted for all emotional and attitudinal scales to test for an interaction effect of 'MusicSpeed' and exposure levels. Based on the findings of Hahn and Hwang (1999) who found an effect of music tempo and audio familiarity on message recall ability, a possible interaction effect between the two variables could have been expected here, however no significant results were found.

These results make it seem as if there are sweet spots in exposure levels during which participants are especially vulnerable to be strongly emotionally affected by esoteric white supremacist content. Their first experience with the content seems to not evoke pleasantness with the group 'Never' making up 54% of the lowest reported scores (1) for 'Happy' and 'Excited' respectively. While continuous exposure only seems to create positive emotional effects at the highest level of 'Often' and in some cases at the medium level 'Occasionally'.

This was not reflected in the analyses of the negative emotional scales which found no significant impact of exposure levels on negative emotional responses. Do these sweet spots in exposure level therefore only exist for positive emotions and does not affect negative emotions? The subsequent analyses of the attitudinal scales shed some more light on this question.

For the attitudinal scales all ANOVAs except for 'Harmless' were significant. Again, Tukey HSD post-hoc tests were conducted to gain insights into which groups differed exactly. The picture these tests painted was similar to the one already established in the analyses of the positive emotional scales. For 'Engaging' participants in the group 'Often' reported significantly higher scores than the group 'Never' ($p = 0.028$), and for 'Funny' the groups 'Occasionally' ($p = 0.042$), 'Rarely' ($p = 0.025$) and 'Often' ($p = 0.012$) all did the same, with 'Often' also showing significantly higher scores than 'Rarely' ($p = 0.008$). For 'Interesting' only the difference between 'Occasionally' and 'Never' ($p = 0.092$) approached significance, hinting at a possible trend. These results were reflected in the composite variable 'Attitude' which found significantly higher scores for 'Occasionally' and 'Often' over 'Never' ($p = 0.017$, $p = 0.011$), as well as higher scores for 'Often' than 'Rarely' ($p = 0.031$). The significant ANOVAs further showed comparatively high effect sizes with all scales except for 'Interesting' showing Eta-squared > 0.1 , explaining a medium to high amount of variance in reported scores.

These results support the notion that mid-level exposure as well as continuous everyday exposures have a positive effect on emotional and attitudinal response, while low exposure does not seem to be related to explicitly negative responses. It therefore seems like desensitisation does happen to some degree, with exposure being more pleasant if the content is familiar. This in turn would mean that if effective content moderation was put in place on social media platforms and users were only exposed to this type of content once, it is unlikely to evoke any positive feelings. The findings of this research therefore highlight the need for

effective content moderation as a means to reduce exposure. However, these findings also indicate that at all levels of exposure, participants were unable to consistently identify the content as harmful, which is underlined by the substantial number of participants classifying the content as harmless despite exposure saturation levels being high throughout the sample. This shows that participants were unable to recognise harmful themes in the content, even if the content itself had no significant effect on evoking positive emotions at the lower exposure levels. Content moderation could therefore not rely on reports by users, as they would underreport their exposure to similar harmful content.

To identify groups that are possibly more at risk of exposure, the correlations between the demographic variables and 'Encounter' was assessed. For gender an independent samples *t*-test was conducted which found a significant difference between genders with $t(104) = -2.22$, $p = 0.029$ (Two-Sided), equal variances assumed. The mean difference between the groups was -0.54, indicating that male participants on average reported higher exposure levels. This is interesting in the context of social media algorithm research. Possible questions that could be asked here are what content male participants engaged with that made it more likely for them to be exposed to the content or if the algorithms tend to suggest this content to users simply based on their genders. Finding a significant effect here is worrying, given that this content seems to reach its target audience quite effectively.

Unfortunately, the low statistical power in the ethnicity and age groups did not allow for any relevant significant effects when conducting one-way ANOVAs. Analyses of larger samples are necessary here to further narrow down who is most at risk of exposure. This was also the case for the ANOVA investigating exposure levels and political affiliation, which one can suspect to be due to the underrepresentation of politically right participants.

A two-way Anova was conducted to investigate whether gender would still have a significant correlation with exposure rates, when controlling for time spent on social media. The results showed no significant effects for 'SocMediaTime' or its interaction with 'Gender', indicating that the comparatively high exposure levels of male participants came to be regardless of the time they spent on social media, further hinting at algorithmic reasons.

To investigate this further the interaction variables 'Like', 'Share' and 'Comment' were analysed. Overall participants reported low hypothetical interaction behaviours, with means of 5.96 ('Like' SD = 1.558), 6.34 ('Share' SD = 1.34) and 6.72 ('Comment' SD = 0.7), with high scores indicating low interaction behaviour. The mean for 'Comment' almost reached the

maximum of the scale 7 with a low standard deviation, indicating that participants regardless of demographic or condition were reportedly unlikely to comment on a similar post. To confirm this and test for other possible trends additional analyses were conducted. Surprisingly a two-way ANOVA of 'Comment' and the two binary condition variables found a significant effect for 'MusicSpeed' at $p = 0.003$, with the overall model being significant as well at $F(3,109) = 3.994$, $p = 0.01$. A t-test subsequently confirmed a significant difference between groups at $p = 0.003$ (Two-Sided), equal variances not assumed, with a mean difference of -0.394. A similar trend could be observed in a t-test of 'Share' and 'MusicSpeed' with $p = 0.052$ (Two-Sided), equal variances not assumed, approaching significance. The mean difference between groups here was -0.49, which, in combination with the result for 'Comment', indicates that participants are more likely to share or comment on the picture if the audio stimuli is slower. However, while the means between groups may differ, the overall high means paired with the low mean differences still present low interaction behaviours across the sample. Therefore, it is questionable whether difference in 'MusicSpeed' can influence active interaction behaviour. Other research designs, such as long-term observational studies of social media interaction behaviour are more suitable to provide conclusive insights in this regard. No other significant effect of the binary conditions or their interaction was found on the interaction scales.

Furthermore, no significant effect of gender on the interaction scales was found, which one can infer from that despite evoking stronger feelings of happiness in male participants, this did not correlate with higher interaction behaviour results. In contrast, political affiliation did show to have a significant effect on interaction behaviours in several one-way ANOVAs. Of the ones conducted for the individual interaction scales 'Like' ($p < 0.001$) and 'Share' ($p = 0.044$) were significant, with 'Comment' ($p = 0.063$) approaching significance. Post-hoc tests revealed that for 'Like', 'Left' showed significantly lower interaction behaviour than 'Centre-Left' with a mean difference of 0.984, however this only equals the difference of 'Very Unlikely' and 'Unlikely' on the scale. Significant differences between 'Right' and other groups were also found across all three interaction scales, but these results were discarded due to the low group size of 'Right'.

The analysis of ethnicity and interaction brought forth a significant difference between 'Mixed (Other)' and 'White (Other)' for 'Share' as well as a difference between 'Mixed (Other)' and 'White (Other)'/ 'White (UK)' for 'Comment', with 'Mixed (Other)' reporting the lowest mean scores for these scales at 5.18 and 5.82 respectively, indicating comparatively higher interaction scores. Sadly, low sample size does not allow for any relevant deductions here

again. As was the case for one-way ANOVAs for age and interaction, which did not yield any significant results.

While the demographics did show some significant effects on mean differences were small and means high indicating low interaction behaviour. It can thus be assumed that engagement with the studied content is more passive across the demographics. Interestingly even for the male participants, despite the reported more frequent exposure. This could hint at gender based algorithmic recommendation mechanisms that do not rely on previous interaction behaviour. Conversely, while men did not report higher exposure but not higher interaction levels, an ANOVA of interaction and exposure levels did report a significant group difference. For all three interaction scales, 'Often' reported significantly higher interaction behaviour than 'Never' and 'Rarely'. The 'Often' mean for 'Like' ($M = 4.75$) was especially low when compared to the general mean of 'Like' at 5.96. This supports the results of the analysis of the exposure variables that found higher exposure to be related to higher levels of interest and excitement, which could in turn result in higher interaction levels. Overall time spent on social media or Instagram did not seem to influence interaction behaviours at all on the other hand. Exposure therefore seems to be a crucial component not only of emotional response but also interaction behaviours.

The results of the expanded analysis of the sample demographics and exposure and interaction levels consequently paint the following picture: female participants leaned significantly more towards the political left and showed less prior exposure to similar content. Male participants on the other hand reported significantly higher exposure levels, which could not be explained by interaction time or time spent on social media, hinting at possible gender-based algorithmic reasons. This is especially worrying paired with the results indicating that higher exposure levels evoke stronger positive attitudinal and emotional responses in participants, while lower exposure levels did not do the opposite. When targeting esoteric white supremacist propaganda online, the key focus should thus be on reducing exposure. Who gets exposed in what ways must be further explored by research with more statistical power to identify groups at risk and tailor exposure reduction measures accordingly. As can be inferred from the results of Section 5.1 since parts of mental processing of these esoteric white supremacist propaganda posts seemingly happens unconsciously, which could have desensitising and/or polarising effects if users are continuously exposed to this type of content.

5.4 Limitations

Throughout the prior parts of this results and discussion section several limitations of this research have been hinted at, including shortcomings in research design and sample size/composition which will be discussed more in-depth in this section. On the methodological side several issues with the research design were identified after conducting the study. In the design of this study careful considerations were made to ensure that ecological validity would be retained to some degree. Of course, it would have been most effective to observe participants react and interact to the content while scrolling on a swipe-based audiovisual social media platform, but the resources available did not allow for such an approach. An online experiment using a light form of deception was chosen to show participants a “random” Instagram post, so they would not immediately realise the purpose of the study. Nonetheless, one can question the ecological validity of this approach and whether its curated nature made participants more prone to recognise the content or answer in a certain way. While, these considerations can be made about the research approach as a whole, within the design of the study several limitations were identified either during or after conducting it.

For one, the emotional and attitudinal scales which were the main data points based on which the hypotheses were either rejected or accepted were comparatively simple and broad. A participant reached out to me anonymously after completing the study and criticized this fact, stressing that they could not accurately report their emotions through the scales. The initial intent with keeping the scales simple and compact was to keep the time in which participants could complete the study short, but unfortunately this seems to have negatively impacted the validity of the scales. A better approach might have been to expand the list of emotions for the scale, while also widening the scale from 7-points to 9 or more points. Similarly, the design of the attitudinal scale could be amended to widen them to 9 or more points and adding additional attitudinal expressions, for example ‘Entertaining’.

Additionally, a scale measuring the self-reported perceived speed of audio and video stimuli was missing from the survey design, which would have been helpful in assessing the validity of the conditions. This is especially noticeable since an insufficient manipulation of the independent variable might have been suspected in this discussion, but no data having been available to give or take any legitimisation to this claim. Still, despite the lack of hard evidence it seems as if the differences in music speed and image presentation rate between conditions were simply too small. As mentioned in Section 2.2, BPM ranges for research like this are usually found in the realms of 60+, while here it was only 27 with the lower end already being

high at 140 BPM. This could have been avoided by increasing BPM difference but also by adding a third condition for both music speed and image rate. A 2 by 2 approach was selected in the research design for this study to achieve significant results even if the sample size was to be comparatively low, however, this did not prove effective. Although, with the current sample size adding a third condition for music speed and image presentation rate would have been unlikely to lead to more significant results as the groups for the conditions would have been even smaller.

This underlines the main issue and limitation of this research, which is the size and composition of its pool of participants. The lacking sample size and diversity was caused by a variety of factors. First, due to delays in the ethical approval for this study, data had to be gathered in the span of 5 days, which resulted in the intended number of participants not being reached. Additional data that was submitted after this five-day period could not be effectively integrated once the data analysis was completed. While the number of datasets affected by this is low, at 3 participants, it is nonetheless unfortunate that they could not be included. Had the data collection period been longer, a significant additional number of participants could have been recruited.

Secondly, technical issues were encountered with the experiment host platform Pavlovia, causing the visual stimuli not to be presented correctly. For the 116 successful submissions 99 sessions started by participants were aborted. It can be assumed that some of the failed sessions were participants who later completed the study successfully, however, it must also be assumed that some would have been new participants who ended up not participating at all. Again, if the time constraints had not shortened the recruitment period, it might have been possible to correct these technical failures as data collection progressed.

Lastly, the sample composition was not diverse enough demographically to give this study general reliability. Young women were the largest group in the sample with participants between the ages of 18 and 30 making up the large majority of the sample overall. Additionally, participants overwhelmingly self-reported themselves as leaning politically left, centre-left or centre, with conservative participants significantly underrepresented. As described previously, likely reasons for this are the practice of recruiting from university social media communities. Expanded recruitment through additional channels would have been advisable to increase sample diversity, especially in political views, age and ethnicity. Unfortunately, lack of time and resources did not allow for this.

6. Conclusion

6.1 Summary of Contents and Findings

This research investigated how the audiovisual design of esoteric white supremacist propaganda on social media affected the emotional response and attitudes towards the content of 113 participants in a between-subjects experiment. In a review of the existing literature, it was established that no research on audiovisual design of propaganda on social media had been conducted using methods from the field of psychology. The relevancy of this research was further established, as only limited research has been conducted on traditional iterations of esoteric white supremacism and even less on the social media phenomenon connected to it.

Participants were presented with four audiovisual conditions, which differed in image presentation rate and music speed. The design of these stimuli was based on a qualitative content analysis of esoteric white supremacist propaganda sourced from TikTok, which found the defining characteristic of its audiovisual design to be Accelerationism. Further insights gained from this qualitative analysis included detailed descriptions of materials used, both visually and audibly, as well as an outline of the different levels of subversive content, social media users encounter when confronted with this type of content. The materials used for visuals varied significantly from classic white supremacist and other far-right imagery, such as glorifications of Nazi-Germany, to entirely unrelated ones such as cars or Japanese Anime Characters. Audios used on the other hand were mostly pop or EDM songs that were sped up to fit the accelerationist design of the content, which paired with the fast image presentation rate results in a type of sensory overload.

How this design affected participants in the study conducted for this research was recorded through self-reported answers on emotional and attitudinal scales. The analysis of the data gathered from these scales did not find any relevant significant effects of the conditions on responses. Further analysis of means, sample demographics and prior exposure levels did yield significant results, however. For the emotional response scales, male participants reported higher levels of happiness while female participants reported higher anxiety levels, indicating that the design of the stimuli, which was targeted towards men, was successful. These findings were not replicated for the attitudinal scales with no group differences between the genders, hinting at possible unconscious processing. Political affiliation did show an effect here however with people identifying themselves as centre-left showing higher levels of interest. Due to skewedness in the sample, however, this finding should be interpreted with considerable doubt.

Demographic data on age and ethnicity was analysed but did not yield any significant insights, due to similar issues with sample composition. Out of the demographic variables, the sample for gender was the most balanced, with some of the more relevant findings of this paper being related to it. Among them were observations of platform algorithmic differences between male and female social media users. Men reported significantly higher levels of prior exposure to the content despite no reported difference in interaction behaviour and lower reported levels of social media use. Unfortunately, no relevant findings on how age and ethnicity affect this observation could be made, again due to sample restrictions. These results do hint at gender based algorithmic reasons as to why male social media users are exposed to the content more often. Heightened exposure also correlated with increased positive emotional and attitudinal responses towards the content making the increased exposure of male participants especially alarming.

The most important finding of this research is, however, the mean reported result of the scale indicating whether participants were able to identify the content as harmful. About 67.3% of the sample did not classify the content as harmful, with 46.9% classifying it as outright harmless. These alarming results have important implications for effective harm prevention campaigns and content moderation, as unknowing continuous exposure to propaganda might have long term desensitising or polarising effects, as highlighted by the correlation between frequent exposure and favourable emotional and attitudinal response.

6.2 Implications for the Research Question

At present the findings of this research allow us to reject all hypotheses it was testing for in this study. For the emotional response scales, *H1* and *H2* hypothesized that an increase in image rate would negatively correlate with feelings of energy and excitement, while an increase in music speed would cause the opposite. However, no significant effects could be found that support this. As was also the case for the attitudinal scales, for which *H3* and *H4* predicted a decrease in the participants' ability to identify the content as harmful with increasing music speed and image rate.

Can the research question therefore confidently be answered with: No, the audiovisual design of esoteric white supremacist propaganda does not affect social media users in a significant way?

At closer inspection it does not seem reasonable. The high percentage of participants who identified the content as harmless leads me to believe that further research is necessary to fundamentally reject the hypotheses and research question. Some part of the content's design must have made it ambiguous enough to not be identified reliably by the participants. Whether this was caused by its audiovisual design or just by specific materials used in the composition cannot be answered using the findings of this study. What can be inferred is that the findings of this research do not support the effects of audiovisual stimuli that have been supported across the existing literature, such as positive emotional effect of increased music tempo and difficulties in identifying unknown visual stimuli during RSVP.

As outlined previously this research was subject to a number of limitations, especially so since it pioneered a novel approach. This approach might very well not be the optimum to study the audiovisual effects of social media propaganda, but a solid case was made in the literature review that new research methodology in the study of social media security is necessary. The gap that exists in the literature leaves a blind spot in the defence against social media propaganda that needs urgent filling, underlining the importance of research such as this.

Furthermore, the results that were gathered on gender-specific algorithmic suggestions shows that relevant insights can be gained with the current approach. There are many more layers of subversive messaging, materials and audiovisual design that need to be peeled back to achieve a sufficient level of understanding of social media propaganda, which has only partly or not at all been addressed by this research. The definition of music speed that this study used, it being defined as having a purely numerical expression in BPM but also a subjective side, show how the perception-shaping variables that were studied here can be multidimensional. Audiovisual design based on user familiarity or specific audiovisual ordering or sequencing would have been difficult to test for in an online approach, while possibly having significant implications for the research question. Similarly, how important it is for audiovisual design to be synchronized, for example by having similar rates of BPM and image presentation rate cannot be deducted from the data gathered in this research. It could be argued that the research question is therefore too broad and should have been amended to fit the scope of the study, but one could also argue that by keeping it broader this study has opened a discussion that exceeds the limits of its own design and highlighted several gaps in the existing research which will have to be filled sooner rather than later. The overarching research question of this discussion should remain almost identical to the one used here with the slight adjustment, that it may include other forms of extremist propaganda on social media as well. Thus, the research question

should not be rejected but should rather continue to be discussed in additional research, as answering it exceeds the scope of this study.

In turn, due to its limitations, this study should therefore not be regarded as being a decisive indicator on whether its research question can be answered with yes or no, but rather as proof that its subject matter presents possibilities for future worthwhile academic endeavours, as well as a case study of a novel approach in the study of social media security. Overall, this research makes a valuable contribution to the study of extremist propaganda on social media despite its lack of significant results.

6.3 Directions for Future Research

It goes without saying that the main shortcoming of this study which should be mitigated in future research is the lacking sample size and diversity. The online format which was employed here definitely has potential to attract larger and more diverse pools of participants and should be utilized accordingly. Additionally, if one was to build on the current approach, the author advises that the scales of the survey part be refined to be less ambiguous and include more options. Similarly, the conditions should differ substantially more so than they did in this study, to increase validity in the between-subjects framework.

Leaving purely methodological advice aside, the findings of this research or the lack thereof also highlighted some further research avenues in need of exploration. First, the identification of groups which are especially at risk of exposure and who might also be more easily affected by the content. To study this, it would be necessary to include not only the groups that were underrepresented in this research but also go beyond that and include participants under the age of 18. It would be interesting to see if the generations that grew up with audiovisual social media from an early age are more literate in terms of identifying harmful content or whether they are more susceptible to its messaging. Looking at the use of social media by far-right parties, which was mentioned in Section 1.1, it becomes clear that social media has long become a battleground for political ambition, with young voters at the centre. Recent polling among German youths shows high levels of support for far-right parties (Statista 2025a), highlighting the need for a better understanding of how young voters build their political identity and how social media influences that process. Of course, doing research on minors brings with it ethical limitations and needs careful research design considerations to avoid

putting participants in harm's way. Nonetheless, given the current political climate in Europe and abroad the author believes it to be necessary to conduct such research.

Secondly, since the audiovisual design did not cause a significant effect in this research further research could be conducted on how different composition of visual stimuli affect social media users of different demographics. Since the higher happiness scores of male participants could not be explained by the binary condition variables, they might have been caused by specific imagery or sequences of visual stimuli in the recreated esoteric white supremacist content. This could be tested for in an online format but also effectively in more sterile laboratory settings.

Lastly, research on audiovisual social media propaganda should be expanded to include different types of content and ideologies. The Hyperborea meme format is by far not the only one that extremists use to disseminate their ideology online, and while the existing literature includes some qualitative analysis of these it has been stressed in this paper that few empirical studies have been conducted. Since social media culture and communities are dynamic and ever changing, security studies research will never be able to fully cover all iterations of propaganda that users are exposed to, but that sure as hell does not mean we cannot try.

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Appendix

A1. Survey Structure and Questions

Page 1 (Emotional response)

How strongly did you experience the following emotions while watching this reel?

(answered by indication on a scale from 1 to 7, with 7 being the strongest)

- Happy
- Energized
- Excited
- Anxious
- Exhausted
- Sad

Page 2 (Attitudinal response)

Please indicate your answer to the following questions about the content of the reel:

The content was...

1. Very interesting
2. Interesting
3. Slightly interesting
4. Neither interesting nor boring
5. Slightly boring
6. Boring
7. Very boring

The content was...

1. Very funny
2. Funny

3. Slightly funny
4. Neither funny nor unfunny
5. Slightly unfunny
6. Unfunny
7. Very Unfunny

The content was...

1. Very engaging
2. Engaging
3. Slightly engaging
4. Neither engaging nor unengaging
5. Slightly unengaging
6. Unengaging
7. Very unengaging

The content was...

1. Very harmless
2. Harmless
3. Mostly harmless
4. Neither harmless nor harmful
5. Mostly harmful
6. Harmful
7. Very harmful

Page 3 (Interaction behavior)

Do you actively use Instagram?

- A. Yes
- B. No

If yes, how much time on average do you spend on Instagram per day?

- A. 0 – 30 minutes
- B. 30 – 60 minutes

- C. 1 – 3 hours
- D. More than 3 hours
- E. Not applicable (No Instagram use)

Do you actively use other social media like TikTok, X etc?

- A. Yes
- B. No

If yes, how much time do you spend on social media over all per day?

- A. 0 – 30 minutes
- B. 30 – 60 minutes
- C. 1 – 3 hours
- D. More than 3 hours
- E. Not applicable (No social media use)

Have you previously encountered similar content on social media to the one shown to you?

- A. Never
- B. Rarely (once or twice a year)
- C. Occasionally (once or twice a month)
- D. Frequently (once or twice a week)
- E. Often (almost everyday)
- F. Not applicable (No social media use)

How likely are you to like this reel?

- 1. Very likely
- 2. Likely
- 3. Moderately likely
- 4. Neutral
- 5. Moderately unlikely
- 6. Unlikely
- 7. Very Unlikely

How likely are you to share this reel?

- 1. Very likely

2. Likely
3. Moderately likely
4. Neutral
5. Moderately unlikely
6. Unlikely
7. Very Unlikely

How likely are you to comment on this reel?

1. Very likely
2. Likely
3. Moderately likely
4. Neutral
5. Moderately unlikely
6. Unlikely
7. Very Unlikely

Page 4 (Demographics)

Please indicate your gender.

- A. Male
- B. Female
- C. Other
- D. Prefer not to say

Please indicate your age.

- A. 18 – 21
- B. 22 – 29
- C. 30 – 39
- D. 40 – 49
- E. 50+

Please indicate your ethnicity.

- A. White (English, Scottish, Northern Irish, British).
- B. White (Irish).
- C. Any other White background.
- D. Irish Traveler.
- E. Roma.
- F. Indian.
- G. Pakistani.
- H. Bangladeshi.
- I. Chinese.
- J. Any other Asian background.
- K. Black British.
- L. Caribbean.
- M. African.
- N. Any other Black background.
- O. Any other mixed background.
- P. Any other ethnicity.
- Q. Prefer not to say.

Where would you place your political views on social issues?

- A. Left
- B. Center-Left
- C. Center
- D. Center-Right
- E. Right
- F. Prefer not to say