

# From Screen to Mind: An Experimental Examination of the Influence of Entertainment-Based Propaganda on Chinese Public Opinion

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## Abstract

This study examines the influence of the increasingly prominent but understudied genre of blockbuster-style propaganda films on public opinion in China. Using the patriotic-themed movie *Wolf Warrior* as the propaganda treatment in an online field experiment, the research provided movie accounts to participants and invited them to watch different movies. These participants were divided into three groups: a forced-exposure group, who were asked to watch the propaganda movie; a placebo control group, who were asked to watch a non-political movie; and a free-choice group, who were given the option to watch *Wolf Warrior* or the non-political movie. Participants' political opinions were surveyed post-viewing, and their viewing habits were tracked for a month. The findings confirm the general appeal and attractiveness of the propaganda film among research participants. Experimental results further suggest that the film can effectively enhance nationalism, economic perception, system pride, and perceived responsiveness among approximately 80% of viewers. However, these effects potentially backfired for the rest of the participants with an initial aversion to propaganda films. These films did not significantly affect participants' viewing preferences the following month. This study reveals the transformative potential of blockbuster-style propaganda films in favorably shaping public opinion towards the regime in China and its limitations, thereby offering empirical insights into the use of entertainment products for propaganda.

Throughout history, many regimes have strategically utilized entertainment as a means to propagate their ideologies. Canonical examples of this practice include Nazi Germany, the Soviet Union, as well as the United States and the United Kingdom during the First and Second World Wars. Propagandists, too, spoke of the potency of entertainment-based propaganda to generate support for a regime and its agenda. Goebbels, the Nazi Minister of Propaganda, once wrote, “Even entertainment can be politically of special value... the moment a person is conscious of propaganda, propaganda becomes ineffective...” (Welch, 2008, p.56). Echoing a similar sentiment, Elmer Davis, the director of the U.S. Office of War Information during World War II, emphasized the stealthy power of film: “The motion picture is the most powerful instrument of propaganda... The easiest way to inject a propaganda idea into most people’s minds is to let it go through the medium of an entertainment picture when they do not realize they are being propagandized” (Coyne and Hall, 2021, p.33).

Despite these insights from propagandists, there is a lack of evidence suggesting that entertainment-based propaganda, in and of itself, generates support for authoritarian regimes. While several studies, such as Adena et al. (2015) and Voigtländer and Voth (2015), have highlighted the effectiveness of Nazi propaganda, particularly among those with prior aligned views, they did not pinpoint entertainment-based propaganda as the primary driver. Similarly, (Hovland, Lumsdaine, and Sheffield, 1949)’s experimental evaluation of the effects of the U.S. military films *Why We Fight* found an increase in knowledge but a limited change in soldiers’ core political attitudes. In the context of China, Mattingly and Yao (2022) found experimental evidence that nationalistic TV dramas could heighten anti-foreign sentiments but did not reduce people’s willingness to protest. Therefore, the efficacy of entertainment as a tool for authoritarian propaganda remains uncertain in the literature. This is particularly puzzling considering the substantial investments made by authoritarian regimes in entertainment-based propaganda, presumably with the aim of generating support for the regime.

China’s recent success in marrying propaganda with entertainment, highlighted by the growing popularity of entertainment-based propaganda, presents an intriguing case study for reassessing the role of entertainment in propaganda. In a concurrent paper, I delve into the political economy of propaganda production in today’s China, uncovering how the state mobilizes the private sector to produce propaganda of high entertainment value. This strategy entails notable finan-

cial implications. Beyond the direct costs, which can reach hundreds of millions of RMB for a blockbuster-style propaganda film, the state’s intervention in the industry has introduced indirect costs due to resulting market inefficiencies.

Despite the success of these efforts in terms of impressive box office returns and enhanced acceptance of propaganda films, one core question remains: Does this highly entertaining propaganda content, while managing to draw large crowds, retain its persuasive power? Put another way, does this widely-consumed entertainment content, sponsored or endorsed by the regime in some capacity, truly serve the regime’s propagandistic objectives?

To address these questions, I employ a novel experimental design, using *Wolf Warrior*, a 2015 action thriller with a patriotic theme, as the treatment within an online field experiment. In my experimental design, participants are provided with movie accounts from the most popular movie website in China, iQiYi. This enhances the “fieldness” of the experiment, as it closely replicates the natural setting in which people commonly consume movies online. Then, participants are randomly allocated to one of three groups: the forced-exposure group, the placebo control group, and the free-choice group. The forced-exposure group is directed to watch a propaganda movie, while the placebo control group watches a non-political movie. The free-choice group has the liberty to choose between propaganda and placebo movies. Following their movie viewings, participants are surveyed on their key political opinions. Their subsequent history of viewing on the movie website is tracked over the following month to shed light on the movie’s effect on long-term propaganda exposure of viewers, and it also gives us a sense of what consumers genuinely prefer to watch in their real-life consumption choices.

This paper presents the first experimental study using blockbuster-style propaganda movies as the treatment in an experimental setting in China. One way in which these movies differ from traditional informational treatments is their high production costs and highly entertaining content. By inviting participants to watch an entire movie rather than just a clip, this experiment also provides a more potent dosage than many previous experimental studies. On the other hand, despite their commercial success and engaging nature, there is no guarantee that propaganda through high-quality entertainment proves more persuasive. The risk exists that blending it with entertainment may dilute the influence of political messaging on the audience. Thus, the effectiveness of these movies as propaganda must be empirically examined.

To conduct this experiment, I enrolled 362 participants for my experiment via a Chinese crowd-sourcing website. The results suggest that propaganda movies effectively enhanced nationalism, economic perception, pride in one's political system (henceforth termed "system pride"), and perceived responsiveness, provided the participants did not harbor an ex-ante aversion to propaganda movies. However, the use of propaganda movies appeared to have backfired among a small portion of the population with a preexisting distaste for propaganda.<sup>1</sup> The overall strongest effect of the propaganda movie was on economic perception. The treatment did not influence the willingness to protest for either group.

This study also reveals that viewing a propaganda movie primarily evoked positive emotions, with pride being the most dominant. Interestingly, the emotional response pattern did not vary between those who have or lack a pre-existing aversion to propaganda movies, although the intensity of these emotions did differ. In the free-choice group, a majority of participants favored propaganda movies over the non-political alternative, underscoring the appeal and competitiveness of contemporary propaganda films. Regarding real-life consumption choices, the study suggests that even though the propaganda film was well-received, it did not establish a sustained preference for similar content. Evidently, tastes concerning entertainment were notably diverse.

Past studies on propaganda have mostly focused on more conventional carriers of propaganda, such as news. Although propaganda through entertainment products is often associated with totalitarian regimes of the past century, it remains a prevalent tool in today's autocratic regimes, including China, Russia, Egypt, and Iran (Tolz and Teper, 2018; Knobel, 2020; Barshad, 2022; Soffar, 2022; El Banhawy, 2019; Sinaee, 2023; Ershad, 2016). This study contributes to the propaganda literature by highlighting the role of popular entertainment as a tool in authoritarian propaganda.

In addition, this study sheds light on both the potential of popular propagandist entertainment to shape public opinion to boost support for the regime, as well as its limitations. The *Wolf Warrior* series has had over 120 million viewings in the theaters alone. With nearly 80% of respondents being positively influenced by the propaganda film, this research suggests that such entertainment-based propaganda largely pays off for the regime. Its ability to alter people's economic perspectives aids the regime's capacity to maintain support even amidst challenging situations. However, caution is

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<sup>1</sup>The analysis of this heterogeneous treatment effect was pre-registered.

warranted, as these movies can backfire with audiences who already hold a distaste for propaganda. The possibility of propaganda backfiring implies that ill-targeted propaganda can deteriorate viewers' perceptions of the regime. In this sense, the film is still whipping the support of the willing audience rather than converting nonbelievers, even though the willing audience represent the vast majority of the population. Behavioral data suggests that despite their popularity, propaganda films may need continual regime support to ensure consistent viewership.

Furthermore, this research contributes to our understanding of persuasion by demonstrating that belief updates generated by soft propaganda were not solely driven by emotional reactions. While the propaganda film effectively stimulated viewers' emotions, people with different pre-existing opinions, though experiencing similar emotions, updated their beliefs differently. This suggests that there is a cognitive process mediating how emotions are translated into beliefs.

The rest of the paper is structured as follows: The first section lays the theoretical groundwork and establishes expectations based on past research. The subsequent section presents my pre-registered experimental design. This is followed by a description of the data collection process and the sample used. In the fourth section, I present the experimental results. The fifth section provides a discussion that integrates these findings within broader scholarly conversations. The paper concludes with a summary and potential avenues for further research.

## 1 Effects of Film Propaganda

The persuasive power of propaganda is a timeless subject. However, many philosophers and practitioners have oversimplified how propaganda works by assuming that individuals are inherently gullible. This perspective can be found in Machiavelli's *The Prince*, which boldly advocates for rulers' use of deception with the assertion that "... men are so simple, and so subject to present necessities, that he who seeks to deceive will always find someone who will allow himself to be deceived..." (Machiavelli, 1993). Another conception of propaganda, popularized by Goebbels, suggests that dictators can instill ideas in their population through repetitive and straightforward messaging (Welch, 2008). However, scientific research contradicts the assumption of people's inherent gullibility. Cognitive scientist Huget Mercier explores this idea in his book "Not Born Yesterday," offering an overview of the current literature and the prevailing view that humans, exposed to a plethora

of past information, are generally resistant to new information (Mercier, 2020).

Before we delve further into this literature, it is important to introduce an important alternative perspective that propaganda works via intimidation instead of persuasion. In her insightful analysis of popular culture in Syria, Wedeen (1998) and Wedeen (2018) demonstrated how propaganda serves as a manifestation of power, inducing compliance and complicity. According to Huang (2018), there exists a distinction between hard and soft propaganda. Hard propaganda, such as poems brimming with excessive praise for leaders, can reduce people's willingness to protest while simultaneously fostering negative sentiments towards the regime because it signals the power of the regime. Furthermore, Little (2017) proposed a formal theory explaining how propaganda can induce support for a government merely through social conformity, regardless of personal belief, thereby sustaining authoritarian regimes.

While recognizing the potential intimidating effects of propaganda, this paper will primarily focus on the persuasive effects of propaganda. In the context of many authoritarian regimes, the creation of persuasive messages, commonly referred to as "soft propaganda" by Huang (2018), continues to be a significant objective. This is evident in China's utilization of the propaganda slogan "telling China's story well." And the Chinese political landscape offers a relevant context for comprehending authoritarian propaganda, given its enduring characteristics such as high regime support and extensive employment of propaganda and censorship (Brady, 2009; Stockmann, 2013; King, Pan, and Roberts, 2014; Lorentzen, 2014; Han, 2015; Huang, 2015; Huang, 2018; Repnikova, 2017; Esarey, Stockmann, and Zhang, 2017; Roberts, 2018; Pan, Shao, and Xu, 2020; Mattingly and Yao, 2022).

Now, as we direct our attention back to the evidence concerning the persuasive effects of propaganda, a noticeable pattern begins to emerge. Observational research on the overall impact of media platforms implies that media can shape individuals' political views and behaviors (Adena et al., 2015; Voigtlander and Voth, 2015; Barber and Miller, 2019; Wang, 2021a; Gagliarducci et al., 2020; Peisakhin and Rozenas, 2018; Kern and Hainmueller, 2009). Meanwhile, experimental studies that specifically examine the isolated effects of individual propaganda pieces have found more limited evidence of the transformative power of propaganda, especially concerning core political attitudes like support for authoritarian regimes Hovland, Lumsdaine, and Sheffield (1949) and Mattingly and Yao (2022). These findings suggest that, while media can influence people's thinking, locating

persuasive pieces of propaganda remains challenging.

The scholarly understanding of the limitations of propaganda has accompanied our understanding of the evolving tactics of authoritarian propaganda. In Guriev and Treisman (2020), which emphasizes the use of propaganda as an authoritarian survival strategy, it is argued that, unlike their twentieth-century counterparts who propagated overarching ideologies, contemporary autocrats focus on persuading citizens that they are competent enough to stay in power.

Can entertainment products be of help to authoritarian propaganda? In the literature, entertainment products is firstly known for their ability to attract attention. In American political literature, it is documented that many voters frequently consume entertainment products, and these products hold particular appeal for those with less interest in politics (Baum, 2005; Baum and Jamison, 2006; Prior, 2005; Prior, 2005; Prior, 2007). This preference for entertainment over news has implications for the democratic process, potentially widening the gap in political knowledge among voters (Prior, 2007). Research has also illuminated how effective entertainment products can be in shaping public opinion (Coyne and Hall, 2021; Kim, 2021). Other studies in authoritarian contexts have also found that entertainment content can captivate audiences (Chen and Yang, 2019; Kern and Hainmueller, 2009). For instance, Kern and Hainmueller (2009) found that East Germans with access to West German media were more supportive of the East German regime. This was likely because they primarily consumed entertainment programs, which increased their life satisfaction. In an experimental setting where free internet access to uncensored information was provided to Chinese users, Chen and Yang (2019) discovered that without extra incentives, users predominantly used the uncensored internet for personal entertainment rather than consuming substantive news.

The literature on Entertainment-Education is another area where the effectiveness of entertainment as a persuasion tool has been extensively studied. This approach is used to foster policy awareness and encourage behavioral change by leveraging entertainment as the medium. A series of field experiments demonstrated that entertainment products could appeal to the target population and facilitate learning on certain subjects (Green, 2021; Green, Wilke, and Cooper, 2020; Green, Groves, and Manda, 2020). Nevertheless, while the evidence suggests that Entertainment-Education works to a certain degree, the effects are not always transformative (Green, 2021). For example, exposure to messages against violence towards women increased the likelihood of reporting incidents to village leaders in a study conducted in Uganda. However, it did not necessarily alter

their views on the broader issue of domestic violence justification. Similar results were observed in a study in Tanzania regarding early or forced marriage and gender hierarchy views. Thus, more empirical studies are needed to evaluate the effectiveness of using entertainment for persuasion.

From a different angle, Esberg (2020) offers a unique view of entertainment in authoritarian regimes. Their research reveals that film censorship, extending beyond politics, served as a reward system for regime supporters, rather than solely restricting political information

Despite the advancements in the literature, our understanding of the impact of entertainment-based propaganda in authoritarian contexts remains limited. To address this gap, I focus on examining China's propaganda blockbusters that gained popularity in the mid-to-late 2010s. Pioneers in this field, Hovland, Janis, and Kelley (1953), proposed three approaches to studying the effects of film propaganda: evaluating the effects of a single film, assessing the effects of a category of films, and manipulating elements within a film to isolate potent components. Since this project concerns the effects of propaganda movies that have received little prior attention, it is essential to first understand the overall impact of propaganda movies as bundled treatments.<sup>2</sup> Given time and budget constraints, starting with a single film rather than a category is a practical choice.

I used *Wolf Warrior*, a 2015 action thriller with a patriotic element, as the treatment propaganda film. This movie is about a soldier in the special forces conducting dangerous overseas operations. *Wolf Warrior* and its sequel have been compared to the Hollywood blockbuster *Rambo: First Blood*. In a controlled experiment, viewer compliance can pose a hurdle if the propaganda movies fail to captivate the viewers—yet the high entertainment value of *Wolf Warrior* enhances the feasibility of this experimental design. Nonetheless, the film's propaganda message is far from obscure. Even though the movie was primarily produced by private companies, the Television and Art Center at the Political Department, affiliated with the Nanjing Military Region, was a co-producer. Memorable lines include “Anyone who offends China will be punished, no matter the distance.” The climactic scenes, which feature a fight over a Chinese flag in the form of a cloth patch on the soldier’s arm, convey a clear patriotic message.<sup>3</sup>

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<sup>2</sup>Unfortunately, this approach limits our ability to pinpoint the specific features of the movie responsible for the effects observed in this study. More targeted questions can be explored in future research.

<sup>3</sup>While more research is needed to provide a definitive answer regarding whether the effects of this film are generalizable to the effects of other propaganda films, a parallel project of mine, which explores perceptions of propaganda films, indicates that this movie is considered more entertaining and less indoctrinating than most other Chinese propaganda films. the entertainment element amplifies the persuasive power of propaganda, it is likely that my chosen film, *Wolf Warrior*, yields greater persuasive effects compared to other propaganda movies.

Another reason for selecting this film as the treatment is its significance within contemporary China. The sequel, *Wolf Warrior II*, became the highest-grossing film upon its premiere. This series gained such immense popularity that the term “Wolf Warrior” was adopted as a nickname for China’s increasingly assertive foreign policy, underscoring the substantial cultural impact of these movies. The first installment, while still commercially successful, was not as sensational, which was crucial for my experimental design. To maintain balance, the experimental design excluded participants who had seen any of the movies used in the experiment. The fact that fewer individuals had viewed the first Wolf Warrior film provided more room for studying the treatment effect of this movie among an audience first exposed to it..

Three categories of effects came under scrutiny in this research: 1) audience attention, emotional reaction, and evaluation; 2) changes in political opinions; and 3) the change in media consumption behaviors. Given the time commitment required from the participants, the experiment’s complexity, and budgetary constraints, the number of participants that I could include was necessarily limited. To mitigate this issue, multiple questions were used to measure the same opinion outcomes, reducing measurement error. Both multiple-choice questions and agree-disagree statements were used to diversify question types and lessen the concern of acquiescence bias. The final measurement of opinion outcomes is the mean standardized response across questions.

Furthermore, I addressed the issue of long-term changes in media consumption behaviors by examining viewers’ subsequent viewing choices. A common concern in experimental designs like mine is whether the provided information can induce a substantial and lasting shift in people’s opinions, particularly in our information-rich world. While it is logically challenging to re-survey participants after a month while minimizing attrition, I sought to determine whether respondents would voluntarily choose to engage with similar content over the course of a month. This can be a crucial prerequisite for a piece of propaganda to generate enduring persuasive effects.

Similar to Hovland, Lumsdaine, and Sheffield (1949), we might be concerned about the “boomerang” effect when a movie is “too Hollywood” to make a convincing presentation (p. 15). However, I argue that if a propaganda movie exhibits a strong resemblance to Hollywood-style entertainment, that can have both positive and negative implications for its effectiveness as a propaganda tool. On one hand, an entertaining propaganda movie that uses the storytelling techniques and has the high production value commonly associated with successful blockbuster

movies, in order to captivate a wider audience, increases the potential for a propaganda message to be absorbed. On the other hand, the association with Hollywood may evoke skepticism or doubt regarding the credibility and authenticity of the propaganda message, and the use of entertaining elements may dilute the intensity of the message. Ultimately, the effectiveness of this highly entertaining Hollywood-style movie as a means of propaganda must be empirically determined.

Many scholars argue that propaganda does not necessarily convert individuals with opposing beliefs, but rather, reinforces the beliefs of a likeminded audience. According to Welch (2008), a historian on Nazi propaganda, effective propaganda “must in a sense preach to those who are already partially converted” (p. 9). Aldous Huxley, as cited by Welch (2008), further characterized propaganda as giving force and direction to existing popular sentiments rather than creating them (p. 9). Several quantitative studies examining the effects of propaganda within the context of the Nazi regime and beyond have provided empirical evidence supporting the heterogeneous treatment effects of propaganda. Adena et al. (2015), Voigtländer and Voth (2015), and Peisakhin and Rozenas (2018). Therefore, when designing research to study the effects of propaganda, it is crucial to consider the role of preexisting beliefs.

One approach to address this issue involves classifying participants based on their preexisting preferences for propaganda or their preexisting attitudes toward the regime. This classification enables us to analyze how propaganda resonates differently with audiences who already hold varying views. Another approach is to classify participants based on their voluntary choice to engage with propaganda. By including a free-choice group, we can examine whether individuals who would willingly choose to watch propaganda respond differently compared to those who would choose not to engage with it, given the choice not to. Through this analysis, we can gain insights into the varying effects and responses observed across different target audiences.

Furthermore, it is crucial to recognize that people’s receptiveness to propaganda exists on a continuum, and understanding the potential audience size that may be receptive to a specific form of propaganda is important. While we may acknowledge that supporters of the regime are generally more receptive to propaganda, determining the precise number of individuals who can be persuaded by propaganda requires further empirical research. By conducting such studies, we can deepen our understanding of the persuasive power of propaganda and its limitations, expanding our knowledge about its effects on different individuals and groups.

## 2 Experimental Design

### 2.1 Experimental Procedure

For this study, I recruited participants through an established and reputable Chinese crowdsourcing platform, Yi Pin Wei Ke ([www.epwk.com](http://www.epwk.com)). My sample was drawn from an online pool of respondents, who are not representative of the general population. The aim was to recruit 360 participants.

In this month-long experiment, I gave participants movie accounts with prepaid subscriptions and randomly assigned them to one of three groups, with equal probabilities of assignment to any of these groups. I then surveyed their key political opinion outcomes and tracked their viewing history over the following month. The full experimental procedure is illustrated in the flowchart shown in Figure 1, as described here:

- (1) Baseline survey: If respondents chose to enter the study, they would first complete a short survey. In it, I asked them to select the movies they had seen from a list of films, and those who had seen the treatment or placebo movie were screened out. I then asked people about their demographic background, movie-watching preferences and habits, general satisfaction with the political and economic situation, and preferred choices between three pairs of movies. Regarding movie-watching preferences, participants were asked to choose from a list of genres, indicating their likes and dislikes. One of the available genre options was “main melody.” All surveys used in this experiment were hosted on Qualtrics, a reputable survey platform.
- (2) Random assignment and treatment delivery: I used *simple randomization* to assign each participant enrolled into one of three treatment conditions, with equal probabilities of enrollment in any of them. Then, each respondent received one online account providing a one-month free subscription to a movie website, IQiYi. IQiYi is the biggest streaming platform in China in terms of user count. It provides a diverse range of entertainment options, including the vast majority of major propaganda films. The account information came along with the encouragement to start with the movie recommended, according to their treatment assignment. They were also encouraged to continue to enjoy the movie subscription for as long as it remained valid (one month).

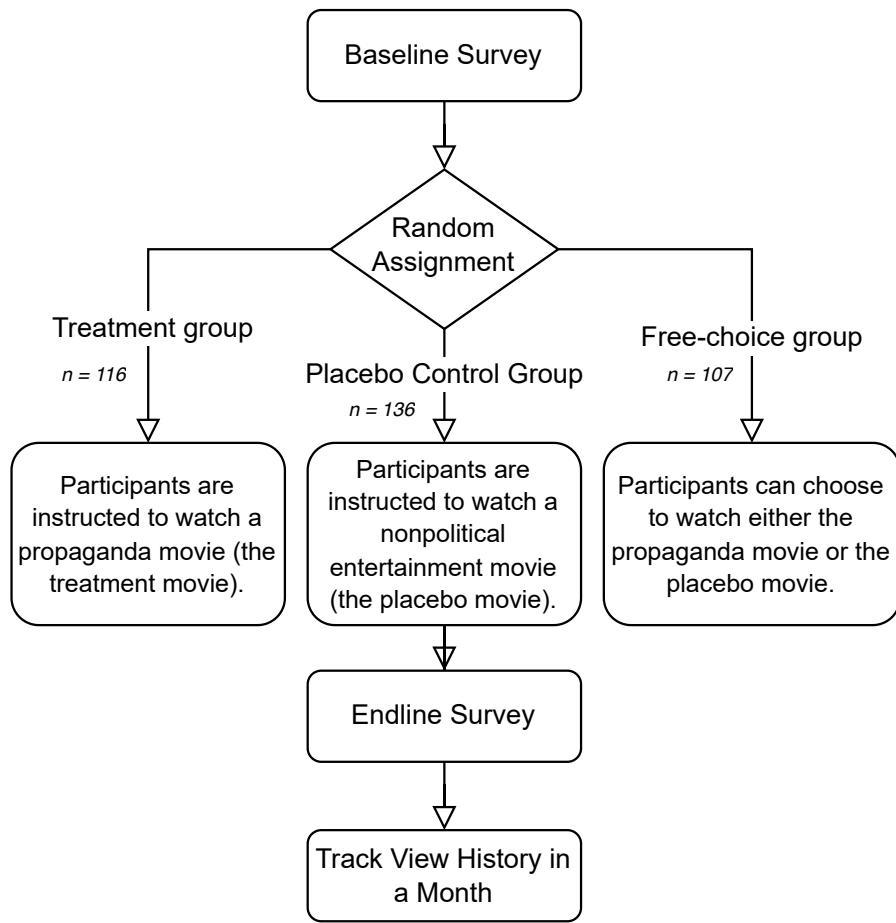


Figure 1: Experimental Procedure: Flowchart

The treatment group was invited to view a propaganda movie, while the placebo control group was invited to view a nonpolitical placebo movie to serve as a baseline control group. In the free-choice group, people could choose to watch one of the two movies. The introduction of the free-choice group allowed us to take into account participants' preferences for treatment options, a crucial consideration in understanding real-world effects shaped by having choices. This is also known as the patient preference trial (Gaines and Kuklinski, 2011).

- (3) Endline survey: One day after receiving the account information, respondents received the endline survey, and they were asked to fill out the survey only after they had watched the assigned or chosen movie. The survey included factual questions about the movie to determine whether they had actually watched it carefully as well as inquiries about their general political attitudes and political engagement.
- (4) Tracking of viewing history: One month after enrolling a participant, I accessed their movie account and recorded their viewing history. This allowed me to confirm whether they had watched the recommended movie and what other movies they had watched.

## 2.2 Movie Selection

As previously discussed, I used *Wolf Warrior*, a 2015 action thriller with a patriotic element, as the treatment propaganda film. This movie is about a soldier in the special forces conducting dangerous overseas operations. The placebo movie is *Legendary Assassin* (the literal translation of its Chinese name is “Wolf Teeth”), a 2008 Hong Kong action thriller about an assassin who killed an evil gangster and ran away. It was made by the same director as the *Wolf Warrior* series, Wu Jing, who was also the lead actor in both movies. The reason for choosing this film as the placebo movie is its similarity to the *Wolf Warrior* films: They share the same genre, director, and lead actor. They also share the wolf-related theme and a similar artistic style. However, unlike the *Wolf Warrior* series, which centers on a soldier from the special forces, *Legendary Assassin* features outlaws and was produced in Hong Kong; thus, it does not contain any political relevancy.<sup>4</sup>

One key difference between the treatment and placebo movies is the presence of propaganda.

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<sup>4</sup>One concern is that somehow the presence of this actor will change people's political opinions, because the actor is widely associated with the *Wolf Warrior* series. This is unlikely, however—the movie should bring the audience into the specific character in the movie, the assassin, which is different than just presenting this actor.



Treatment: Wolf Warrior



Placebo: Legendary Assassin



Free-choice condition: Choose One Among the Two

Figure 2: Selection of Movies

That being said, I am not claiming that there is no difference in the entertainment values between these two movies. The placebo was mainly used to ensure that people in the control group watch a movie that has similarities to the treatment movie but does not change people's political opinions. Aside from that, I allowed for the possibility of varying entertainment values. Since these two movies garnered different levels of popularity, screening out respondents who had previously seen either of these movies was necessary to maintain a balance between the treatment and placebo groups.

### 2.3 Outcomes

I pre-registered a set of survey outcomes that encompass emotional responses to movies and opinion outcomes. These outcomes were carefully selected based on a combination of factors, including prior literature, pilot surveys, and theoretical reasoning. Concerning opinion outcomes, I have narrowed them down to five primary categories: nationalism, economic perception, system pride, perceived government responsiveness, and willingness to protest.<sup>5</sup>

<sup>5</sup>Initially, I considered including more issue-specific opinions, such as hawkishness. However, these specific opinions were not included as primary outcomes in the final experiment. This decision was based on the lack of evidence from the pilot round indicating any significant impact of the movie on these attitudes. Additionally, it was observed that the movies did not significantly stimulate thinking related to any specific political issue, making it unlikely for them

In this study, nationalism encompasses both a benign attachment to one's country and the belief that one's country surpasses others in superiority. Economic perception represents participants' perceptions of the economic situation, including their own economic situation and the country's economic situation, both in the present and the future. System pride refers to whether individuals believe in their political system. Perceived government responsiveness reflects the public's perception of how well the incumbents are addressing their needs. Lastly, people's willingness to protest refers to their willingness to take to the streets, which is a significant concern for an authoritarian regime's survival.

For each of my primary outcomes, I calculated an index by averaging standardized responses from several questions to minimize measurement errors. These questions were intentionally designed to be standard and commonly used, and I varied their formats as much as possible to mitigate issues like acquiescence bias. Additionally, the selected questions underwent multiple rounds of piloting to ensure their reliability as measurements. Detailed descriptions of these questions will be provided when discussing the relevant results. In Appendix A.1, I have included a correlation matrix for individual question scores, which are aggregated to construct a scale.

I also pre-registered behavioral outcomes, which include the movie participants selected to watch and the number of propaganda movies they watched in the following month.

## 2.4 Estimand and Estimation

We can identify the intent-to-treat effects by comparing the outcomes of all subjects assigned to different treatment groups. Because I expected the compliance with the treatment in the free-choice group to be high, the average treatment effects among the treatment compliers should be comparable to the intent-to-treat effects that I will use for most of the empirical analysis in this paper.

My empirical analysis is based on estimating regressions of the following form:

$$Y_i = \alpha + \beta_1 T1_i + \beta_2 T2_i + \beta_3 \mathbf{X}_i + \epsilon_i$$

$Y_i$  refers to the outcomes.  $T1$  refers to whether an individual is assigned to the forced-exposure to affect more targeted political opinions.

group.  $T2$  refers to whether an individual is assigned to the free-choice group.  $\mathbf{X}_i$  represents the control variable(s).  $\epsilon_i$  is the error term.

I reported the regression results from two models: a simple regression with only a treatment indicator, omitting covariates; and a regression model that also includes demographic variables as covariates to be adjusted.

Given the patient preference trial design, I am equipped to estimate the treatment effects among those who are prone to watch propaganda movies versus those who are not. To accomplish this goal, I will employ an instrumental variable strategy. Compared to the placebo control group, in the free-choice group, some individuals were experimentally induced to choose to watch propaganda movies. I can estimate the proportion of compliers (also referred to as self-selectors, those who would choose to watch the propaganda movie if assigned to a free-choice group) and the treatment effects specific to them using the instrumental variable approach. Similarly, compared to the treatment group, in the free-choice group, some individuals were experimentally induced to choose *not* to watch propaganda movies. Thus, I can estimate the proportion of non-selectors (those who would choose not to watch the propaganda movie if assigned to a free-choice group) and the treatment effects among them using the same instrumental variable approach.

However, it is important to note that my pilot survey suggests that most respondents may opt for the propaganda movie, resulting in insufficient statistical power for this particular estimation. Therefore, this exercise should be considered exploratory, as stated in my pre-analysis plan, which was pre-registered.

### 3 Data Collection and Sample

The participant enrollment took place from February 24, 2023, to March 31, 2023. Endline surveys were collected between February 25, 2023, and April 6, 2023. A total of 362 participants were enrolled in the study. Among them, 116 participants were assigned to the treatment group, 136 to the placebo control group, and 107 to the free-choice group. The final survey included responses from 101 participants in the treatment group, 116 in the placebo control group, and 93 in the free-choice group. For additional details related to compliance and attrition, please refer to Section 4.3.1.

This study's sample displays biases towards certain demographics, with over-representations of male, younger, and higher-educated respondents. The extent of this bias is represented in Appendix A.2, illustrating the distribution of gender, education, and age among the participants.

Preference for propaganda movies, which was identified in prior to the treatment delivery, is a crucial aspect of heterogeneity explored in this study. In the baseline survey, respondents were asked, "What types of movies do you usually prefer to watch? Please select all that apply." They were provided with 12 options, ranging from romance and comedy to action and main melody movies, among others. Subsequently, they were asked, "What types of movies do you usually prefer not to watch? Please select all that apply." The same 12 options were presented. If participants chose "main melody movie" for either of the questions, they were classified as liking or disliking propaganda movies, respectively.

The distribution of respondents' taste for propaganda movies reveals that the majority of respondents were initially indifferent to this genre ( $n = 223$ ). Among the rest, I observed that there were more respondents who had a distaste for propaganda movies ( $n = 83$ ) than those who had a preference for them ( $n = 51$ ). One respondent selected "Main Melody Movie" for both the "like" and "dislike" questions.

Due to the small sample size of the group that expressed a preference for propaganda movies, I collapsed this group with those who expressed indifference for the purpose of analysis, creating two subgroups based on whether respondents expressed a distaste for propaganda movies or not. Thus, analysis of the heterogeneous treatment effects can be conducted by examining the treatment effects among two subgroups: one consisting of respondents who did not express a distaste for propaganda movies ( $n = 274$ ), and the other comprising respondents who did express a distaste for such movies ( $n = 84$ ). There may also have been a minor shift in this distribution comparison with the pilot round, as shown in Appendix 21. Appendix 6 illustrates that male participants and those who express low satisfaction with the country's overall situation are more prone to disliking propaganda movies, though these relationships do not achieve statistical significance.

## 4 Experimental Results

In this section, I will present and discuss the empirical results. First, I will examine the differences between the treatment group and the control group, excluding the free-choice group. Then, I will introduce the findings from the free-choice group. Subsequently, I will conduct additional tests related to threats to identification. Finally, I will discuss the interpretation of the experimental results.

### 4.1 Comparing the Treatment Group and Control Group

By comparing the treatment group and the control group, I delved into the estimated treatment effects to address the influence of the propaganda treatment on individuals' emotional responses to movies, political views, and subsequent consumption decisions. For the opinion questions, I will address the results related to the overall indexes first before delving into individual questions.

#### 4.1.1 Emotions

In the survey, I asked questions that assessed the emotional experiences of viewers while watching the movie. The survey presented four distinct emotional states—sadness, happiness, anger, and pride—and asked respondents to rate their emotional experiences using a five-point scale. When selecting the emotions to examine, I followed the practice of Mattingly and Yao (2022). The scale included the options of “almost none,” “relatively few,” “moderate,” “relatively many,” and “extremely many.”

Interpreting the bar plots that I used requires some notes, as follows. The bar labeled “Placebo Control” represents the mean value for the control group, while the “Treatment” bar denotes the mean value of the control group plus the estimated treatment effect. Furthermore, the error bars represent the range from the control group’s mean value plus the lower limit to the upper limit of the 95% confidence interval for the estimated treatment effect.

Based on the data presented in Figure 3, we can see that the new commercial propaganda, such as *Wolf Warrior*, elicited some emotional responses in individuals. This propaganda movie elicited stronger feelings of anger and pride compared to the other emotions. This particular propaganda movie elicited especially powerful feelings of pride.

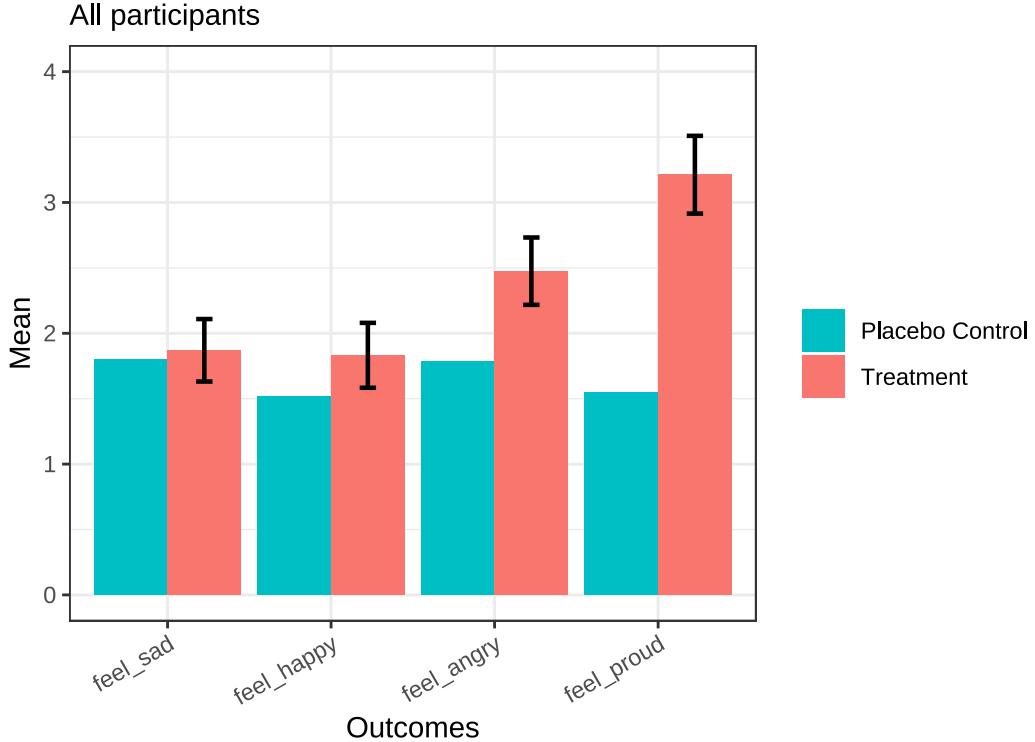


Figure 3: Emotions During Movie-Watching

Further evidence supports the idea that, for the most part, participants enjoyed the propaganda movie utilized in the experiment. Appendix A.14 shows that viewers rated the propaganda film higher, on average, than the placebo film.

#### 4.1.2 Changes in Opinions

In Table 1, I present the results of linear regression models for five outcome variables, including nationalism, economic perception, system pride, perceived responsiveness, and willingness to protest, where the predictor variable is the treatment status (control or treatment). The main outcomes are obtained by averaging standardized responses to various questions. The details of the questions and the results for each question will be presented shortly.

The results in “Panel 1: All Participants” suggest that the propaganda film had a possible effect on enhancing nationalism with an effect size of 0.114, although this effect is not statistically significant, given the standard error of 0.123. The film positively influenced people’s economic perceptions, with an effect size of 0.175, and this result is significant at 10% level. The propaganda

Table 1: Main Results: Effects of Propaganda Movie on Opinions

|                                  | Nationalism       | Economic Perception | System Pride      | Perceived Responsiveness | Willingness to Protest |
|----------------------------------|-------------------|---------------------|-------------------|--------------------------|------------------------|
| (Intercept)                      | -0.052<br>(0.084) | -0.107<br>(0.065)   | -0.052<br>(0.071) | -0.053<br>(0.066)        | -0.062<br>(0.070)      |
| Treatment                        | 0.114<br>(0.123)  | 0.175+<br>(0.096)   | 0.137<br>(0.105)  | 0.166+<br>(0.098)        | 0.055<br>(0.104)       |
| Num.Obs.                         | 217               | 219                 | 219               | 219                      | 219                    |
| <i>Panel 2: Dislike MM - No</i>  |                   |                     |                   |                          |                        |
| (Intercept)                      | -0.008<br>(0.091) | -0.088<br>(0.070)   | -0.034<br>(0.078) | -0.027<br>(0.071)        | -0.027<br>(0.090)      |
| Treatment                        | 0.272*<br>(0.131) | 0.319**<br>(0.100)  | 0.291*<br>(0.112) | 0.322**<br>(0.101)       | 0.063<br>(0.130)       |
| Num.Obs.                         | 157               | 159                 | 159               | 159                      | 159                    |
| <i>Panel 3: Dislike MM - Yes</i> |                   |                     |                   |                          |                        |
| (Intercept)                      | -0.149<br>(0.167) | -0.150<br>(0.133)   | -0.094<br>(0.142) | -0.113<br>(0.134)        | -0.142<br>(0.099)      |
| Treatment                        | -0.435<br>(0.265) | -0.303<br>(0.211)   | -0.374<br>(0.224) | -0.359+<br>(0.211)       | -0.002<br>(0.157)      |
| Num.Obs.                         | 60                | 60                  | 60                | 60                       | 60                     |

film increased pride in the political system with an effect size of 0.137, but this is not statistically significant. The film increased perceived responsiveness with an effect size of 0.166, a result that is significant at 10% level. Lastly, it had a slight dampening effect on the willingness to protest, with an effect size of 0.055, though this is not statistically significant.

To further analyze the data, I investigate subgroup effects based on participants' pre-treatment expressions of dislike for propaganda. The results are presented in "Panel 2: Dislike MM – No," and "Panel 3: Dislike MM – Yes." In "Panel 2: Dislike MM – No," the estimated treatment effects on those who did not express prior distaste for propaganda were consistently positive and statistically significant across all outcomes, except for willingness to protest. Among this group of subjects, the propaganda film substantially increased outcome values including nationalism, economic perceptions, system pride, and perceived responsiveness by approximately a 0.3 standard deviation.

However, in "Panel 3: Dislike MM – Yes," the treatment yielded negative effects on all outcome variables except for the willingness to protest. Notably, these negative effects were more

pronounced compared to those observed in individuals with a favorable view of propaganda. The most substantial negative effect was observed on nationalism, where the treatment shifted outcome values by less than half a standard deviation. For other variables, the treatment produced a shift of more than 0.3 standard deviations. This suggests that the treatment may have had an inverse effect on participants who initially disliked the target of the propaganda, although these results are not statistically significant.

Figure 4 presents a visual representation of the estimated subgroup effects. Compared to the other group, participants who had previously expressed distaste for propaganda movies exhibited slightly larger absolute estimated effects, although these effects are less precisely estimated. This does not necessarily imply that this group had an opposing emotional experience during their viewing of the movie, as both groups showed a roughly similar emotional pattern. Instead, it seems more plausible that this group disagreed with the movie’s message and subsequently adjusted their beliefs in the opposite direction.

This variation in treatment effect between the two subgroups could lead to the overall effect of the treatment, when averaged across all participants, appearing statistically insignificant. In other words, the positive effect of the treatment on the first subgroup—those who did not express a prior distaste for propaganda—could be partially “cancelled out” by the negative effect on the second subgroup, those who expressed a distaste for propaganda movies, resulting in an overall effect that is small or even negligible.

Let us now consider the pattern based on the original questions and scales used. Figure 5 displays the individual questions that comprise the nationalism index. The respondents initially exhibited a high level of nationalism. However, those who did not express dislike for main melody movies still experienced a small increase in their sense of nationalism after watching the propaganda movies, further elevating the already high baseline level of nationalism. Conversely, those who expressed prior distaste for propaganda movies tended to react differently, displaying negative treatment effects. It is worth noting that certain questions—particularly those related to extreme forms of nationalism (such as “nationalism1” and “nationalism2”)—elicited greater backlash compared to milder questions about national pride (such as “national\_pride1” and “national\_pride2”). While the treatment had only a marginal effect on the participants’ responses to milder questions, it significantly influenced their responses to more extreme questions, as well as their willingness to

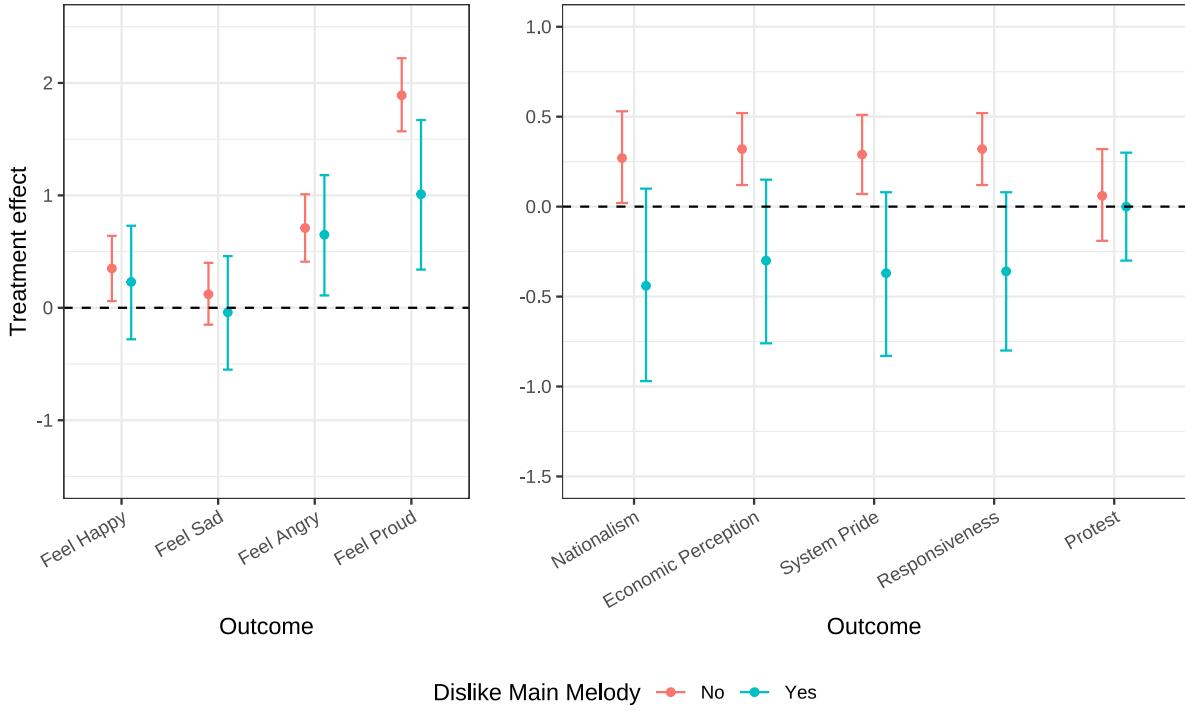
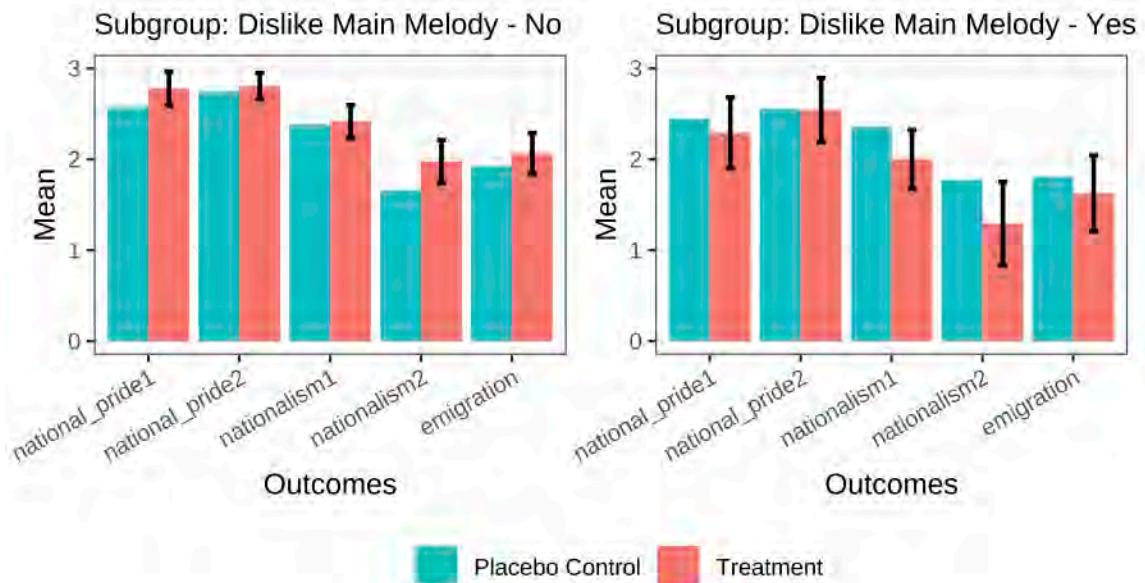


Figure 4: Treatment effects by outcome and taste for propaganda

emigrate, with a notable shift of 0.5 on a 5-point Likert scale.

Figure 6 presents the individual questions that pertain to economic perception. Participants who did not express dislike for main melody movies experienced an increase in their economic perception after watching the propaganda movies, meaning their confidence in themselves and the country's current economic situation experienced a substantial boost, with an increase of 0.5 on a 5-point Likert scale. However, the outlook for the future, which was initially more positive, only saw a marginal increase. On the other hand, those who expressed a prior distaste for propaganda movies only experienced an increase in the perception of their current economic situation, at a size comparable to that of the other group. While they had a slightly lower outlook for their own economic situation in the future, this group significantly downgraded their outlook for the country's economic situation. This downgrade had a notable effect on both their present and future perceptions, resulting in a shift of approximately 0.5 on a 5-point Likert scale.

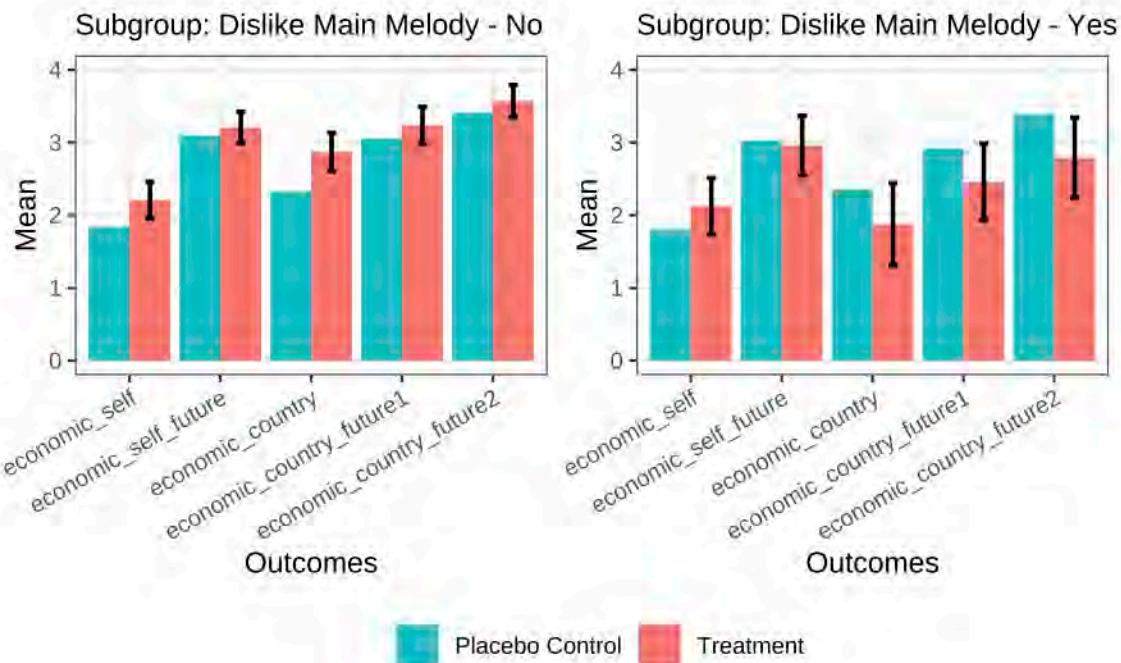
In regard to system pride, as demonstrated in Figure 7, the individual questions reinforce the observation of a divergent response to the treatment. A majority of participants who did not express distaste for main melody movies experienced a steady increase in their system pride after viewing



| Index             | Questions  | Scales  |
|-------------------|--|---|
| 1 national_pride1 | As a Chinese, I feel very proud.                                       | 0 = Strongly disagree,<br>3 = Strongly agree    |
| 2 national_pride2 | I am proud of China's history and arts.                                | 0 = Strongly disagree,<br>3 = Strongly agree    |
| 3 nationalism1    | Generally speaking, China is better than most other countries.         | 0 = Strongly disagree,<br>3 = Strongly agree    |
| 4 nationalism2    | People should support their country even if the country is wrong.      | 0 = Strongly disagree,<br>3 = Strongly agree    |
| 5 emigration      | Given the chance, how willing would you be to live in another country? | 0 = Strongly willing,<br>3 = Strongly unwilling |

Figure 5: Nationalism: Individual Questions

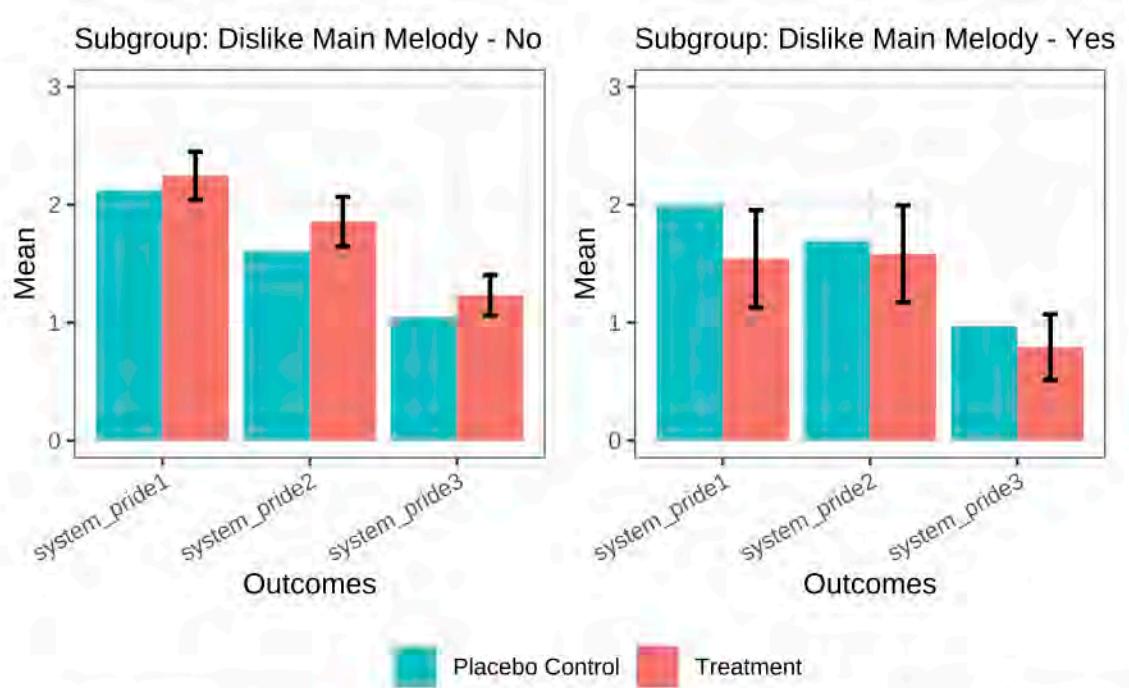
Note: The bar labeled “Placebo Control” represents the mean value for the control group, while the “Treatment” bar denotes the mean value of the control group plus the estimated treatment effect. Furthermore, the error bars represent the range from the control group’s mean value plus the lower limit to the upper limit of the 95% confidence interval for the estimated treatment effect.



|   | <b>Index</b>             | <b>Questions</b>  | <b>Scales</b>                      |
|---|--------------------------|---|------------------------------------|
| 1 | economic_self            | Overall, how would you rate your current economic situation?  | 0 = Very bad,<br>4 = Very good     |
| 2 | economic_self_future     | Overall, how would you predict the change of your economic situation in five years?   | 0 = Much worse,<br>4 = Much better |
| 3 | economic_country         | Overall, how would you rate the country's current economic situation?   | 0 = Very bad,<br>4 = Very good     |
| 4 | economic_country_future1 | Overall, how would you predict the change of country's current economic situation in a few years?   | 0 = Much worse,<br>4 = Much better |
| 5 | economic_country_future2 | How do you think your child's standard of living will compare to yours when they are your age (if you don't have a child now, assume you have)? | 0 = Much worse,<br>4 = Much better |

Figure 6: Economic Perception: Individual Questions

the propaganda movies, equaling roughly 0.2 on a 5-point Likert scale, as shown across responses to questions. The remaining participants experienced a decrease in their sense of national pride. The most significant disagreement was observed in response to the statement that the political system deserves people's blind support even if it encounters problems, resulting in a downgrade of approximately 0.5 on a 4-point Likert scale. Moreover, participants exhibited an increased belief that the regime requires change, with an average shift of 0.2 on a 3-point Likert scale. However, they only marginally lowered their confidence in the regime's ability to solve problems.

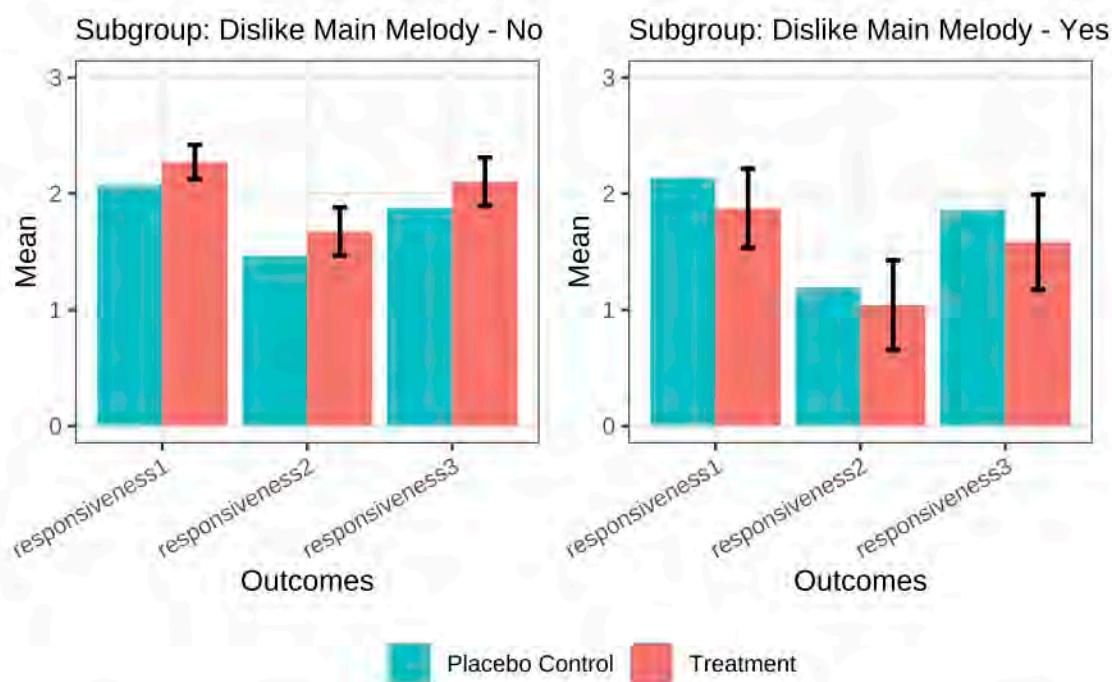


| Index           | Questions  | Scales  |
|-----------------|--|---|
| 1 system_pride1 | A political system like ours, even if it runs into problems, deserves the people's support.            | 0 = Strongly disagree,<br>3 = Strongly agree                            |
| 2 system_pride2 | Our political system is capable of solving the most pressing problems our society faces.               | 0 = Strongly disagree,<br>3 = Strongly agree                            |
| 3 system_pride3 | Would you say our system of government works fine as it is, needs minor change, or needs major change? | 0 = It needs major change,<br>2 = It works fine and no need for changes |

Figure 7: System Pride: Individual Questions

Regarding perceived responsiveness, as illustrated in Figure 8, the individual questions once

again affirm the existence of a varied response to the treatment. In particular, the majority of participants who did not harbor a prior dislike for main melody movies experienced an elevation in their perception of government responsiveness after viewing the propaganda movies. Although the increase was modest, it demonstrates a consistent pattern across questions, amounting to an average increase of approximately 0.2 on a 4-point scale. Conversely, the remaining participants experienced a decrease of a similar magnitude in their perception of government responsiveness.

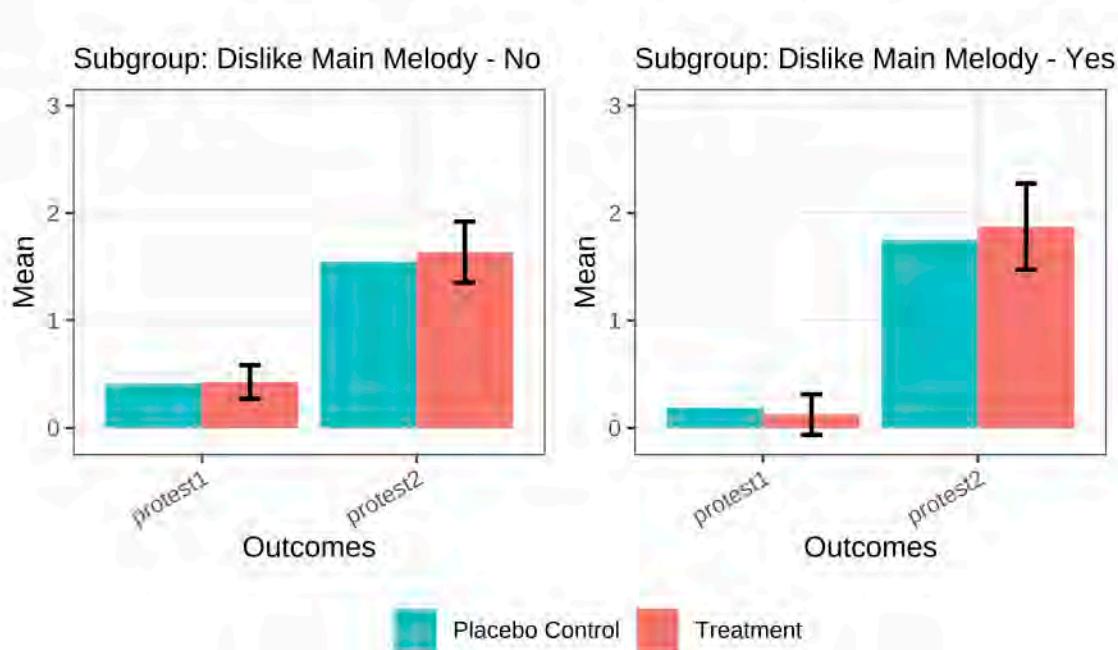


| Index             | Questions   | Scales  |
|-------------------|---|---|
| 1 responsiveness1 | Overall, our government is working for the people and responsive to the needs of people.              | 0 = Strongly disagree,<br>3 = Strongly agree  |
| 2 responsiveness2 | Currently, there are not enough legal channels for ordinary people to influence government behaviors. | 0 = Strongly disagree,<br>3 = Strongly agree  |
| 3 responsiveness3 | How responsive do you think the current government is to people's needs?                              | 0 = Very unresponsive,<br>3 = Very responsive |

Figure 8: Perceived Responsiveness: Individual Questions

Finally, as depicted in Figure 9, propaganda movies did not reduce participants' willingness to protest. The study design is unable to produce an explanation of why this should be the case, but

this could potentially be attributed to the dual-edged nature of propaganda films. While they may heighten people's satisfaction with the regime, consequently diminishing their inclination to protest, the intense emotional responses they incite could also make people more agitated and, thus, more inclined to protest.



| Index      | Questions  | Scales  |
|------------|--|---|
| 1 protest1 | If you have encountered very difficult situations or been treated very unfairly in your life, would you consider seeking solutions through the following channels? (choose all that apply) | 0 = "Offline petitions and protests" is not chosen,<br>1 = "Offline petitions and protests" is chosen |
| 2 protest2 | If you and a group of people experienced very unfair treatment in your life, and someone organized a gathering or group walk, would you consider participating?                            | 0 = Definitely no,<br>3 = Definitely yes  |

Figure 9: Willingness to Protest: Individual Questions

#### 4.1.3 Consumption of Propaganda Movies in the Subsequent Month

As I examined people's consumption of propaganda movies in the following month, depicted in Figure 10, there was no compelling evidence that the initial propaganda film sparked much additional

interest in such content. Even without any intervention, respondents who initially held no distaste for propaganda films already showed a higher baseline for viewing such content than those who did. However, this count appears to grow only slightly due to the treatment. Conversely, respondents who initially reported disliking propaganda did show a modest rise from their considerably low baseline viewing habits. Both increasees are not statistically significant.

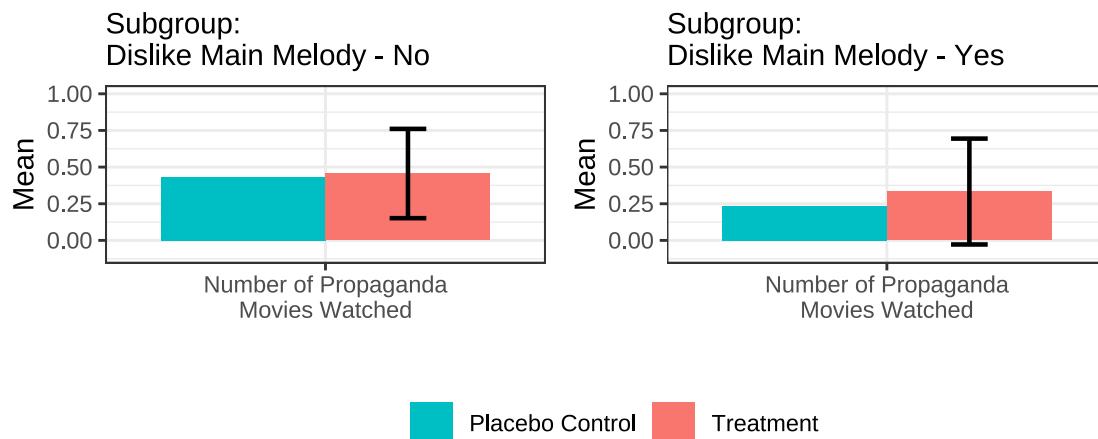
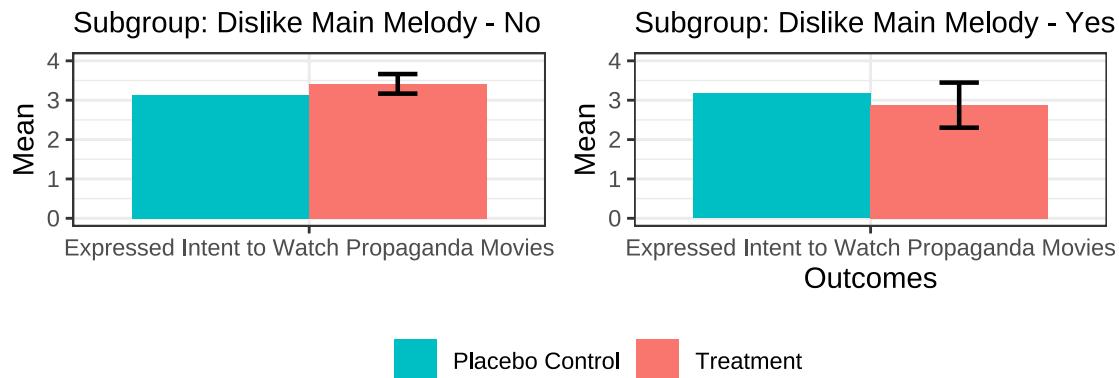


Figure 10: Actual number of propaganda movie watched following the treatment

These behavioral findings present an interesting contradiction to participants' stated preferences. As shown in Figure 11, when asked about their willingness to view a sequel to the propaganda movie in the endline survey, respondents who did not express a distaste for propaganda films reported

a heightened interest in viewing similar content as the result of the treatment. In stark contrast, those who had initially expressed distaste for propaganda report a decreased willingness to watch the sequel as the result of the treatment.



| Index               | Questions                      | Scales                                   |
|---------------------|--------------------------------|--|
| 1 intent_propaganda | Intent to Watch Wolf Warrior 3 | 0 = Definitely No,<br>3 = Definitely Yes |

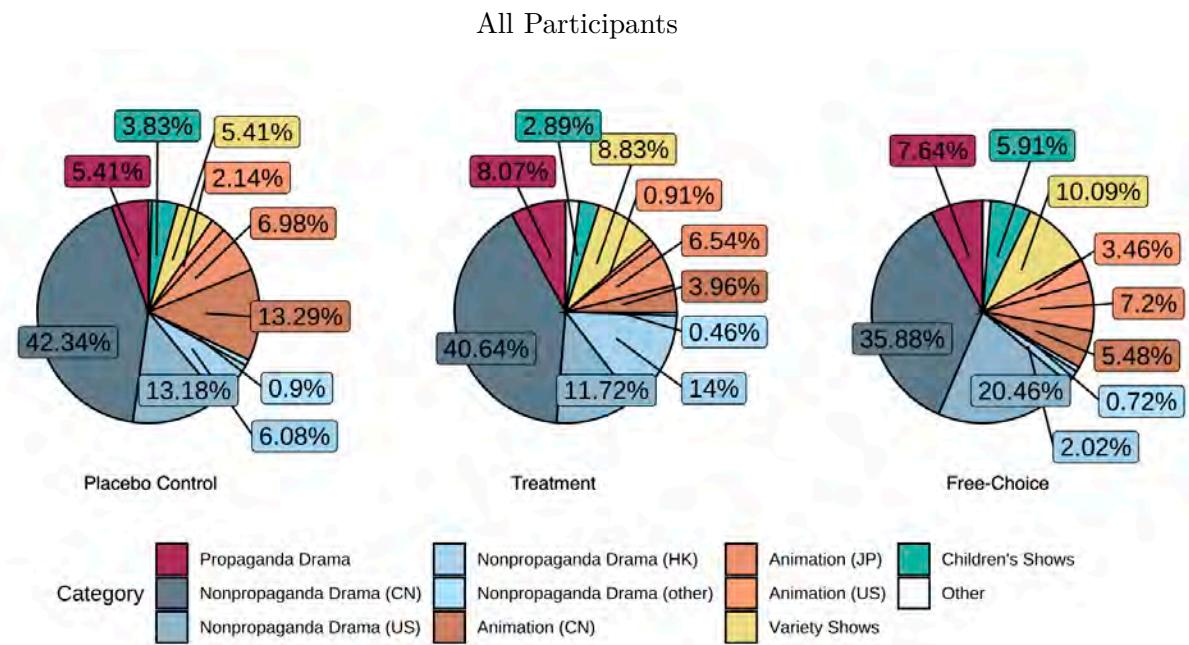
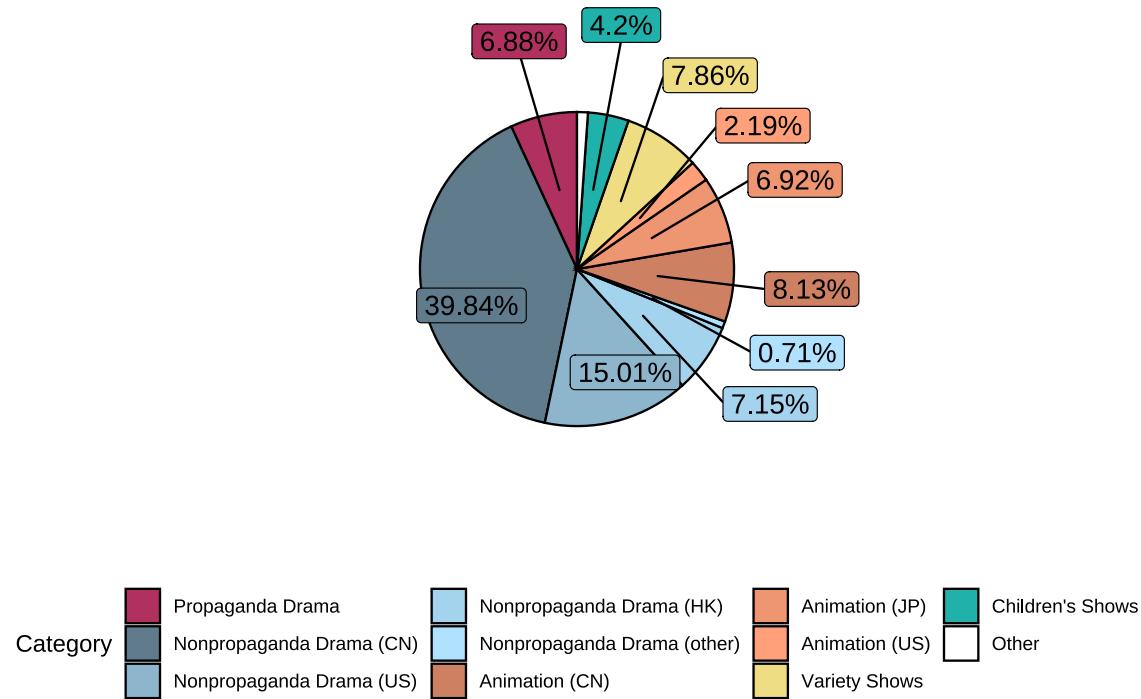
Figure 11: Expressed intent to watch propaganda

These findings suggest that while the treatment seems to polarize the existing sentiments toward watching propaganda films, it does not effectively change the actual consumption behavior in the subsequent period. People's unwillingness to act on their expressed taste suggests that many more factors affect people's consumption choices related to political content aside from their political preferences.

The behavioral data further emphasizes the natural diversity of people's entertainment preferences. The movie website offers a wide range of options, making propaganda movies a relatively insignificant genre in the vast sea of entertainment. On average, participants watched 8.56 movies using their account, with the maximum number reaching 85. In contrast, the average number of subsequent propaganda movies viewed following the assigned film was 0.47, and the highest number observed so far was 6. Among all propaganda movies watched by more than 1%, the average viewing percentage was 58.43%.

The pie charts in Figure 14 illustrate the various types of entertainment products that people consumed in the subsequent month. At the top of the graph, we see the consumption choices for all participants. The data show that non-propaganda dramas dominated the entertainment consumption, accounting for 62% of the total consumption. Notably, the Chinese audience exhibited a pronounced preference for domestic entertainment, which indicated a strong appeal of locally produced content. Propaganda dramas accounted for a smaller 6.88% of the entertainment pie, suggesting a general inclination among viewers towards narratives that steered away from explicit political or ideological content. The data also illuminate the diversity in the audience's taste. There was considerable consumption not just of American and Hong Kong dramas but also of animations, variety shows, and other genres. In terms of animation, the marginally higher popularity of Chinese content compared to Japanese was intriguing, considering the global standing of anime. This likely signaled a burgeoning appeal for Chinese animation within the domestic market.

At the bottom of the graph, we have the consumption choices divided by treatment groups. I want to clarify that movies watched less than 1 percent of the time are not excluded from this data analysis. As a result, the treatment group appears to have a high percentage of propaganda consumption. However, in reality, many of these movies were watched less than 1 percent of the time, suggesting that these figures might be inflated by instances of auto-play. Therefore, the previous test, where such viewings were excluded, would provide a more accurate representation. Other than that, all three groups exhibited patterns that are consistent with my previous discussion.



By Treatment Groups

Figure 12: Audience's Taste in Entertainment

## 4.2 Analyzing the Free-Choice Group

What do people choose when offered a choice between the treatment movie and the placebo control movie? In the baseline survey, respondents were asked to indicate their preference between the treatment movie (propaganda) and the placebo control movie (non-propaganda). To mask the actual treatment, three pairs of movies were presented for the respondents to choose from. As shown in Figure 13, in the survey, 76.36% of respondents indicate a preference for the propaganda movie.

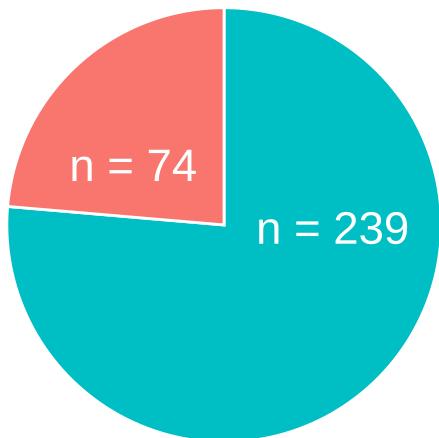
However, when participants in the actual free-choice group decided which movie to devote 90 minutes to, only 63.27% of them chose the treatment movie. This number is smaller than what they indicated in the survey results, indicating a gap between what people say and what they actually do. The table confirms that more people switched from propaganda movies to non-propaganda movies than the other way around. These results show that while the propaganda movie is the more popular choice in both the survey and the actual free-choice group, there is a discrepancy between the stated preferences and actual choices.

Appendix A.9 shows that male participants, younger participants, those with higher education levels, individuals from lower-tier cities, and those with lower incomes were more likely to opt for the propaganda movie instead of the nonpolitical movie. However, none of these differences are statistically significant.

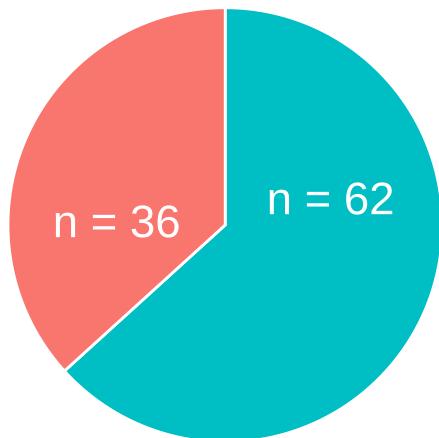
Tables 2 to 5 present the mean and standard deviation of the outcome values from different groups. Consistent with common expectations, the mean outcome in the free-choice group generally falls somewhere between the placebo group and the treatment group. This suggests that if we divide respondents into those who would choose to consume propaganda given another choice and those who would not, propaganda is unlikely to have a negative average treatment effect on either group.

Appendix A.10 provides the intent-to-treat (ITT) estimates for the average treatment effect across different treatment statuses. Appendix A.11 presents the instrumental variable (IV) estimates of the average treatment effect among self-selectors (those who would choose to watch propaganda films given an alternative choice) and non-selectors (those who would not choose to watch propaganda films given an alternative choice). It is important to note that this is an exploratory exercise with limited statistical power. However, the results do not reveal a consistent

Baseline Survey Results



Actual behaviors



Choice      Nonpolitical      Propaganda

|               |                               | Expressed preference |                               |
|---------------|-------------------------------|----------------------|-------------------------------|
|               |                               | Propaganda           | Nonpolitical<br>Entertainment |
| Actual choice | Propaganda                    | 54                   | 8                             |
|               | Nonpolitical<br>Entertainment | 14                   | 22                            |

Figure 13: Expressed preference vs actual choice  
33

Table 2: Including the Free-Choice Group: Number of Subjects and Probability of Watching Propaganda

| Treatment Group | Number of Subjects | Probability of Watching the Propaganda Movie |
|-----------------|--------------------|--|
| placebo         | 139                | 0.00   |
| free-choice     | 107                | 0.63   |
| treatment       | 116                | 1.00   |

Table 3: Including the Free-Choice Group: Emotional Response to Movies

| Treatment Group | Happiness |      | Sadness |      | Pride |      | Anger |      |
|-----------------|-----------|------|---------|------|-------|------|-------|------|
|                 | mean      | sd   | mean    | sd   | mean  | sd   | mean  | sd   |
| placebo         | 2.52      | 0.86 | 2.80    | 0.91 | 2.52  | 1.20 | 2.52  | 1.03 |
| free-choice     | 2.84      | 0.87 | 2.74    | 0.88 | 2.84  | 1.48 | 2.84  | 1.02 |
| treatment       | 2.83      | 0.95 | 2.87    | 0.88 | 2.83  | 1.02 | 2.83  | 0.90 |

Table 4: Including the Free-Choice Group: Political Opinions

| Treatment Group | Nationalism |      | Economic Perception |      | System Pride |      | Responsiveness |      | Protest |      |
|-----------------|-------------|------|---------------------|------|--------------|------|----------------|------|---------|------|
|                 | mean        | sd   | mean                | sd   | mean         | sd   | mean           | sd   | mean    | sd   |
| placebo         | -0.05       | 0.89 | -0.11               | 0.64 | -0.05        | 0.76 | -0.05          | 0.69 | -0.06   | 0.75 |
| free-choice     | -0.02       | 0.91 | 0.05                | 0.60 | -0.03        | 0.71 | -0.05          | 0.81 | 0.10    | 0.79 |
| treatment       | 0.06        | 0.92 | 0.07                | 0.77 | 0.08         | 0.79 | 0.11           | 0.76 | -0.01   | 0.78 |

Table 5: Including the Free-Choice Group: Consumption of the Propaganda Movie in the Subsequent Month

| Treatment Group | Number of Propaganda Movies Watched |      |
|-----------------|-------------------------------------|------|
|                 | mean                                | sd   |
| placebo         | 0.49                                | 1.68 |
| free-choice     | 0.53                                | 0.93 |
| treatment       | 0.55                                | 0.74 |

pattern across these groups.

### 4.3 Threats to Identification

#### 4.3.1 Compliance and Attrition

There was a certain degree of attrition in each group. Specifically, 15 participants or 12.93% of the treatment group, 20 participants or 14.02% of the placebo control group, and 14 participants or 13.08% of the free-choice group did not complete the final survey. These attrition rates are fairly balanced across treatment groups.

As part of the strategy to measure compliance, I assess participants' ability to identify the correct elements, plots, and lines from a list of options. The results indicate that more than 91.44% of respondents achieved an accuracy rate of above 60%, while more than 80.82% achieved an accuracy rate of above 80%. Furthermore, 42.46% of respondents achieved a perfect accuracy rate of 100%. These findings suggest that there is strong compliance among the participants with their assigned treatment.

The Complier Average Causal Effect (CACE), which represents the average treatment effects among those who paid attention to the film, is estimated using an instrumental variable approach. I obtain the CACE estimates using the attention score mentioned above as the measure of compliance, as shown in Appendix A.5. The overall pattern remains consistent.

#### 4.3.2 Manipulation Checks

In the endline survey, I asked participants to write a few sentences commenting on the movie they had watched. To discern whether participants had absorbed the propaganda messages from the movies, I analyzed the word clouds generated from the audience's comments. Figure 14 presents the results. The prominent words for the non-propaganda movie were "plot", "feeling", and "exciting". This suggests that viewers primarily focused on the storyline and the thrill of the film, characteristics typical of non-propaganda content. The absence of politically charged words or messages indicates that viewers were not impacted by any distinct ideological or political message from this movie.

In contrast, the comments for the propaganda film included words like "China," "patriotism," and "soldier." This implies that viewers noted the nationalistic and military-themed propaganda

messages within the film, in addition to paying attention to the storyline. The presence of these words suggests that the film successfully conveyed its ideological content to its audience.



Legendary Assassin: Comments in Chinese

Wolf Warrior: Comments in Chinese



# Legendary Assassin: English-Translated Comments

## Wolf Warrior: English-Translated Comments

Figure 14: Audience Impressions

### **4.3.3 Covariate Adjustment**

As presented in Appendix 7, covariate imbalances are observed across the groups. After accounting for these covariates, as demonstrated in Appendix A.7, the overall results remain mostly consistent. However, it is noteworthy that among individuals who expressed an aversion to propaganda, the estimated effects remain negative but decrease in absolute magnitude. For a visual representation of these changes, please refer to Appendix A.8.

### **4.3.4 Other Heterogeneous Treatment Effects**

Appendix A.12 illustrates that the treatment tends to negatively affect those initially dissatisfied with the country's overall situation, while having a positive effect on the rest of the participants. This confirms the previous finding that propaganda influences different individuals with different political attitudes in distinct ways. Appendix A.13 presents subgroup treatment effects among those who frequently consume movies and those who do not. No clear distinction is discernible from these results.

## **5 Discussion: Interpreting the Results and Their Implications**

This research reveals that propaganda blockbusters can serve as a particularly well-received and uplifting medium for political messaging. Participants generally received the propaganda film used in this study well, as shown by their high movie ratings in Appendix A.14. Contrasting with Huang (2018)'s concept of hard propaganda, wherein propaganda deteriorates subjects' opinions about their country, the popular propagandist entertainment in this case represents a softer propaganda approach. This research further shows that such well-received propaganda elicits more positive than negative emotions, with pride being the most prevalent emotion. In contrast, the experiment that Mattingly and Yao (2022) conducted with an anti-Japanese TV drama stirs feelings of anger and sadness while suppressing a sense of happiness and pride. This anti-Japanese drama likely taps into the “Century of Humiliation” (1839–1949) narrative, a common thread in Chinese propaganda to fortify Chinese nationalism. However, the new commercial propaganda film primarily provokes positive emotions, mirroring China's track as a rising power. Films that inspire positive emotions are likely more appealing as commercial entertainment than those predominantly triggering negative

emotions such as anger and sadness. While negative emotional experiences can inflame resentment toward a specific group, positive emotional experiences excel in fostering hope and shared purpose, and thus they can also be of help to propaganda.

This study demonstrates how such popular propagandist entertainment shapes public opinions. Mattingly and Yao (2022)'s experimental study on the effects of nationalistic propaganda demonstrated enduring increases in anti-foreign sentiments but found no evidence that it affects respondents' self-reported willingness to protest. This study, however, suggests that while propaganda may not directly influence willingness to protest, it can shape various opinions that bolster the regime's legitimacy. While producing popular propaganda films for authoritarian regimes presents challenges and demands substantial investment, this paper suggests that the potential payoff for the regime is also substantial. These films have the power to capture the hearts and minds of a vast majority of their viewers—an important point to consider in light of their enormous audience. For example, *Wolf Warrior* garnered an estimated viewership of over 20 million, while its sequel, *Wolf Warrior 2*, reached an astounding 100 million viewers. This highlights the crucial role these movies play in shaping public sentiment and underscores their importance for the regime.

The most pronounced effect of this propaganda film is to foster a sense of optimism about current and future economic conditions. Despite prevalent literature suggesting the difficulty in swaying economic views (Frye, 2022; Coyne and Hall, 2021; Sobolev, 2019), this research indicates that while people's economic understanding is rooted in personal experience, instilling hope can significantly reshape these perceptions. Done well, efforts to shape economic views offer a less contentious method of political messaging, making economic perceptions more malleable than political attitudes. This implies that even during economic downturns, the Chinese government might maintain its legitimacy by preserving a positive economic outlook among its people.

The magnitude of the treatment effect among individuals who did not exhibit a preexisting aversion to propaganda is significant—comparable to the effect of increasing general satisfaction by one unit. In the baseline survey, individuals could choose from five options to express their overall satisfaction with China's current economic and social conditions. A one-level boost in people's overall satisfaction carries significant meaning, given its all-encompassing nature. The fact that the treatment has a similar effect to that of a one-level increase in people's overall satisfaction suggests that the government can use propaganda to influence political opinions as a substitute for

improving the country's overall conditions.

Despite these findings attesting to the effectiveness of the propaganda, the propaganda itself is not without limitations. For one, it does not necessarily cultivate a taste for similar films. This suggests that even if the propaganda movies are initially popular, in order for them to be continuously consumed by viewers, they need ongoing promotion and support from the regime. Building on my concurrent project about the production of entertainment-based propaganda, this implies that the regime must consistently shape the market to favor such movies over nonpolitical entertainment. This has significant economic consequences, as government intervention of this nature can lead to substantial economic inefficiencies. In addition, we do not know how long-lasting the initial persuasive effects are.

For another, a small subset of viewers harbored worsened attitudes after watching the film. However, this was not due to experiencing different emotions during the movie-watching process. In fact, they tended to experience similar emotions to others, but to a lesser extent. This indicates that the effects of entertainment-based propaganda are not solely determined by the emotions it elicits; instead, the actual changes in opinions following emotional responses are influenced by the cognitive processing of political information. This processing varies among individuals with different predispositions, highlighting the role of individual differences in shaping the influence of propaganda. It implies that, for authoritarian regimes, ill-targeted propaganda might as well boomerang, deteriorating people's perception of the regime. Importantly, the decision to consume a movie depends on factors unrelated to political opinions, such as the movie's brand name and its significance in popular culture. While this may be advantageous for the authoritarian regime in terms of attracting a wide audience and fostering a pro-regime popular culture, it could also result in the movie drawing viewers who are actually repelled by the political messaging, potentially leading to backlash after viewing it.

Nonetheless, the fact that propaganda films positively influenced nearly 80% of the respondents is significant. Even if one perceives this kind of propaganda as merely preaching to the choir, the widespread acceptance it garners serves as a strong testament to its potency. After all, it remains unclear whether an authoritarian regime is truly concerned with garnering support from every single one of its citizens. Indeed, if a regime is capable of garnering passionate support from approximately 80% of its populace, it could arguably be one of the most popular regimes in history.

Backed by such an overwhelming majority, propagandist entertainment could empower the state with a substantial capacity to implement its policies or further its objectives.

## 6 Conclusion

In 2021, Wang Xiaohui, the former head of the Film Bureau, characterized the establishment of a strong atmosphere of love for the party, country, and socialism throughout the entire party and society (Wang, 2021b). This paper demonstrates that a commercialized propaganda movie can indeed influence opinions in favor of the regime among a majority of the population. The results indicate that the experimental treatment movie was well-received, generating emotional resonance—particularly a strong sense of pride—leading to an increase in nationalism, positive economic perception, pride in the system, and perceived responsiveness. The magnitude of this effect is comparable to the influence of increasing people’s general satisfaction by one unit on a 5-point Likert scale question. Considering the number of individuals who have watched similar productions in theaters, it is likely that these movies make a substantial contribution to a pro-regime popular culture in China.

However, three important caveats need to be considered. First, the treatment effects were only observed among respondents who did not express a preexisting aversion to propaganda movies, accounting for approximately 80% of all respondents. Among the remaining 20%, the estimated treatment effect might be negative, although the estimation is not precise. Second, despite the positive reception of the propaganda movie, behavioral data indicate that people do not subsequently consume more propaganda movies. The experimental site, an actual movie streaming website, offers a large variety of entertainment options, including content that cannot appear on the big screen. Behavioral data suggests that people’s preferences for entertainment are naturally diverse, and while there has been some voluntary consumption of popular propagandist entertainment products in recent years, it remains a relatively minor category compared to the wide array of diverse entertainment options available. Third, we do not know how long-lasting these effects are.

The current paper is insufficient to fully address the question of how entertainment facilitates persuasion. In future work, I plan to enhance our understanding of this question by conducting a series of experiments. In one upcoming experiment, I aim to examine how two different

mediums—comedy and serious political commentary—affect the resonance and impact of both pro-CCP messages and those opposing it. I hypothesize that comedy, while having a broader appeal and swaying more people positively, might not produce as profound changes in opinions among the susceptible audience as direct political commentary does. The results speak to why authoritarian governments or activists might choose one media approach over another.

In another upcoming experiment, I aim to investigate the varied effects of different Chinese propaganda messages embedded within entertainment products to understand the true limitations of entertainment-based propaganda. I will be comparing the effects of three categories of propaganda messages: (1) Nationalist propaganda found in action thrillers and war movies; (2) Propaganda emphasizing the state’s capacity, showcased in films about the state’s combat against natural disasters and corruption; (3) Propaganda designed to promote citizen role models, particularly those who are dedicated to advancing the state’s missions. I hypothesize that the first two types will be more persuasive to the audience than the last one. The results of the experiment could suggest a dynamic interplay between state-promoted messages and public receptivity to those messages, indicating that the state cannot simply manufacture popular narratives without considering the audience’s inclinations.

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## A Appendix

### A.1 Correlation matrices

These correlation matrices represent the correlations between the individual questions that combine to form an index for the outcome variables,

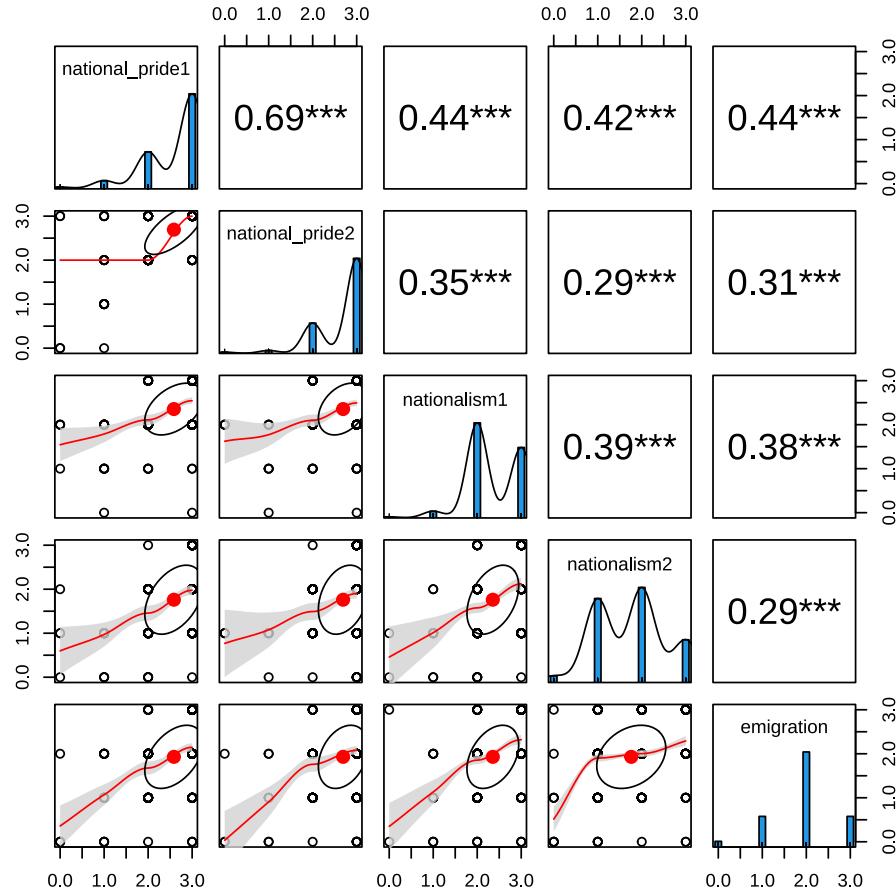


Figure 15: Correlational matrix: nationalism

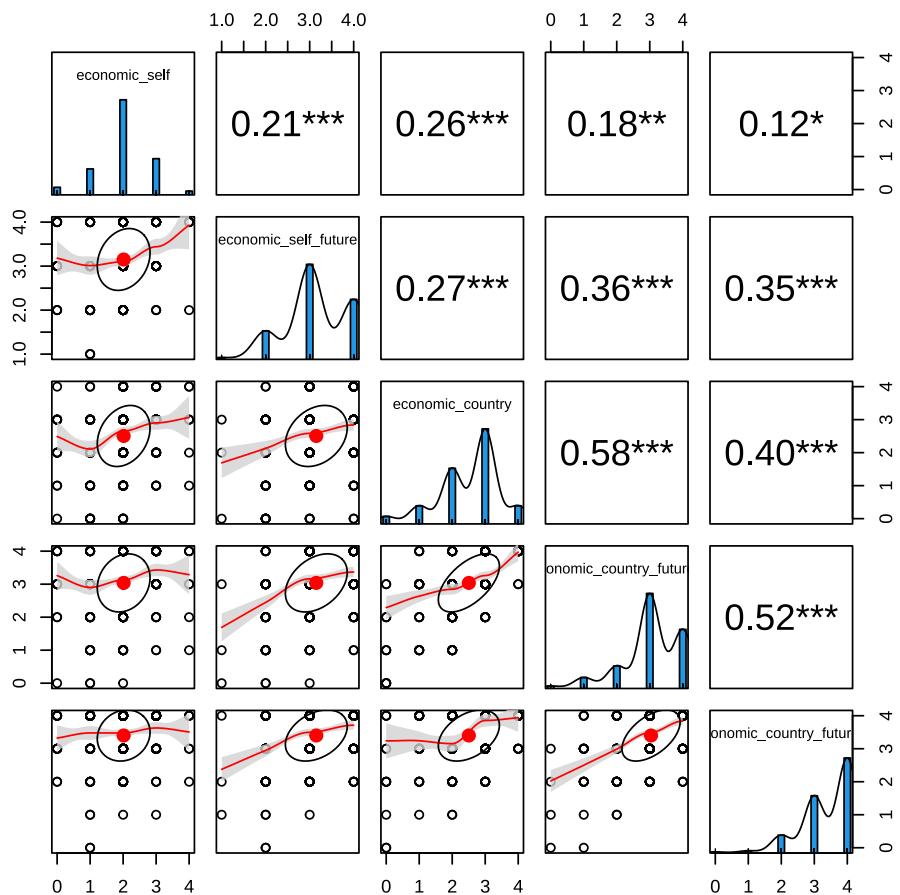


Figure 16: Correlational matrix; economic perception

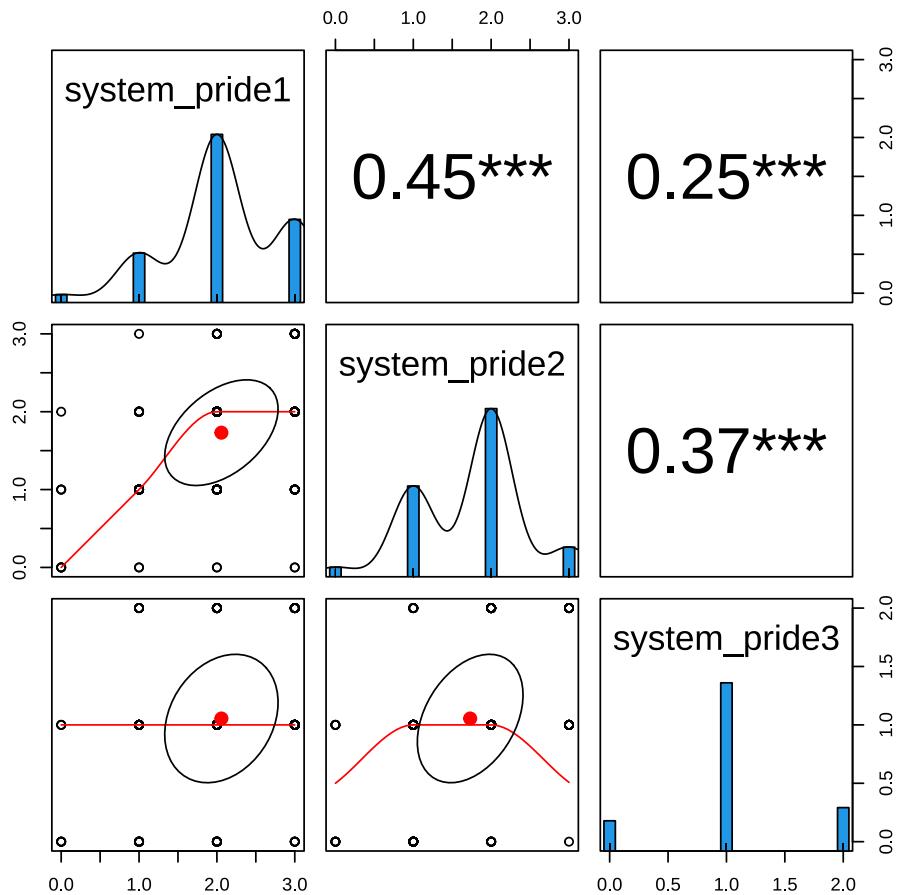


Figure 17: Correlational matrix: system pride

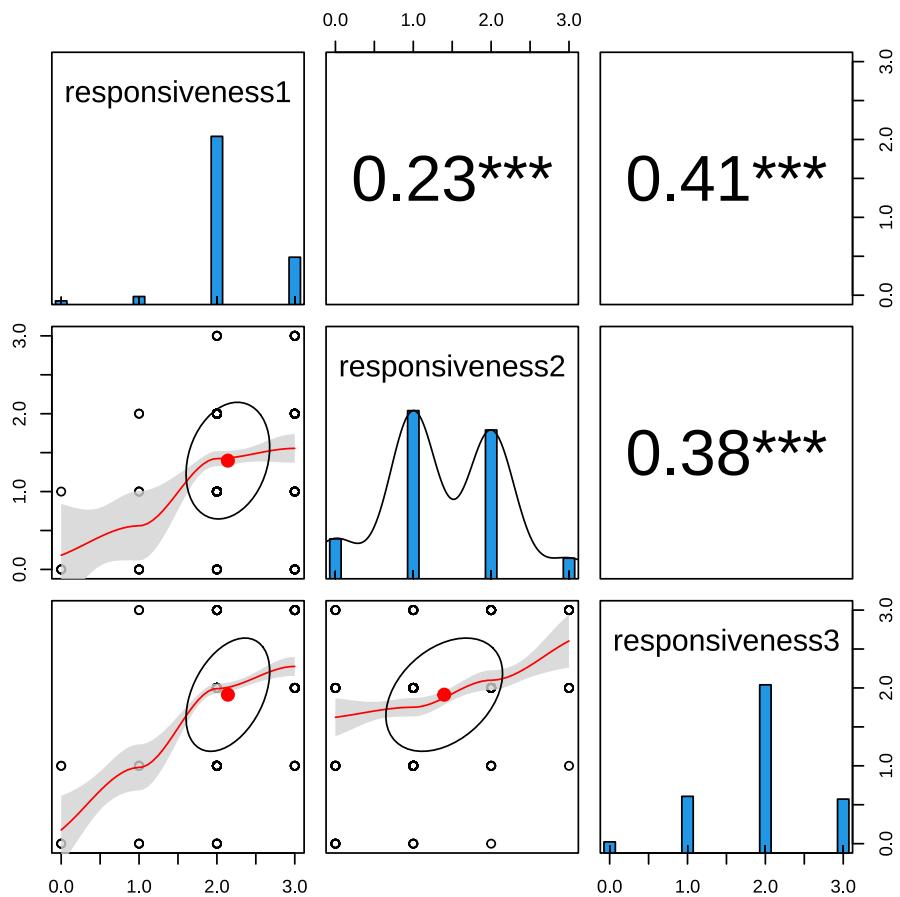


Figure 18: Correlational matrix: perceived responsiveness

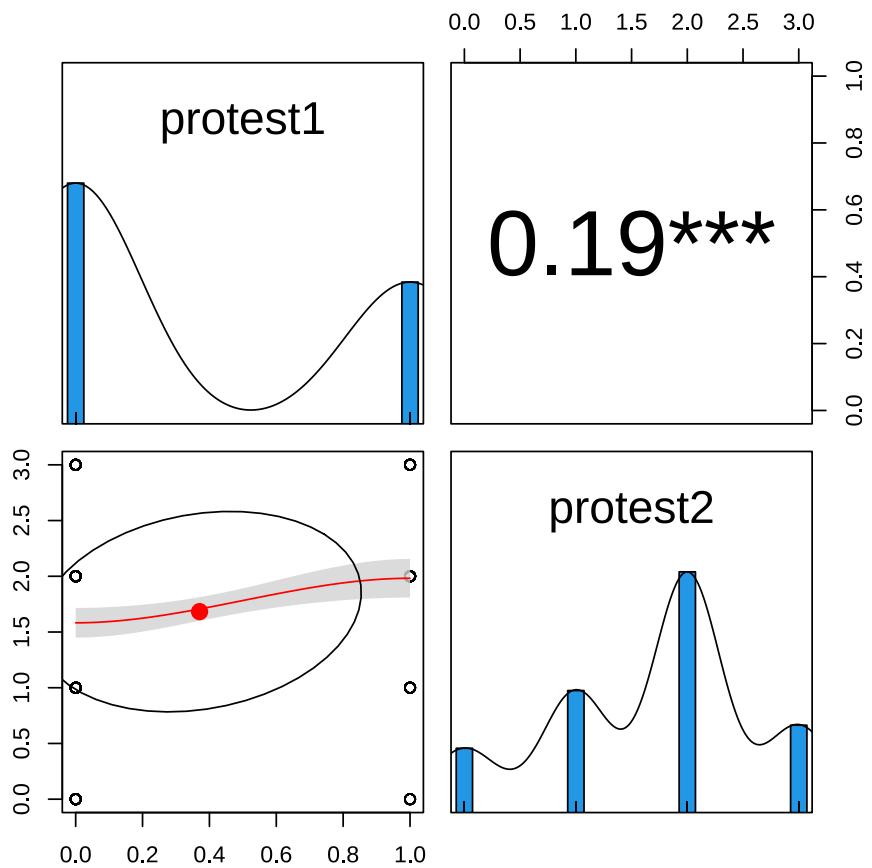


Figure 19: Correlational matrix: protest

## A.2 Characteristics and Bias of Sample

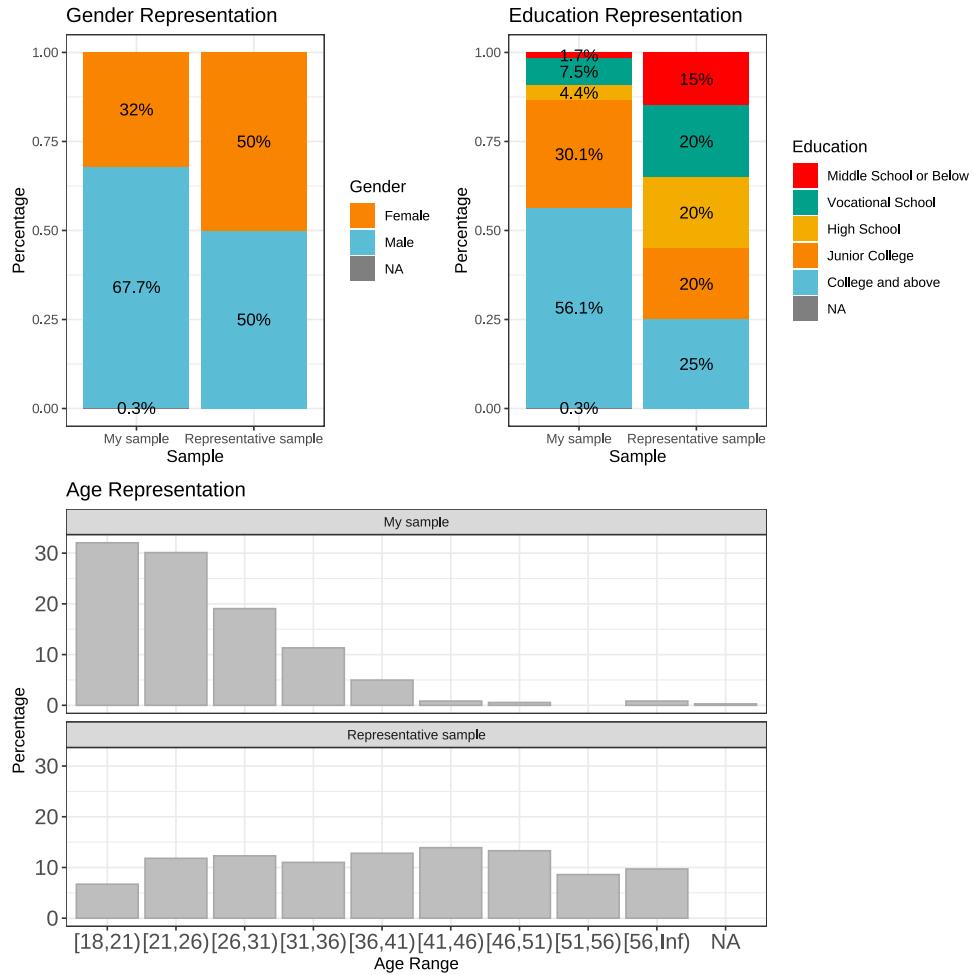


Figure 20: Characteristics and Bias of Sample

### A.3 Changes in Preferences for Propaganda Movies

The pilot round was conducted on the same platform between February 2022 and March 2022. Compared with the pilot round, the portion of people who are indifferent decreased to 62.3%. Meanwhile, the portion of people who like propaganda movies has increased from 11.3% to 14.2%, and the portion of people who dislike this genre has also increased from 19% to 23.2% (see Figure 21). The observed differences between the two rounds suggest a change in respondents' taste for propaganda movies over time.

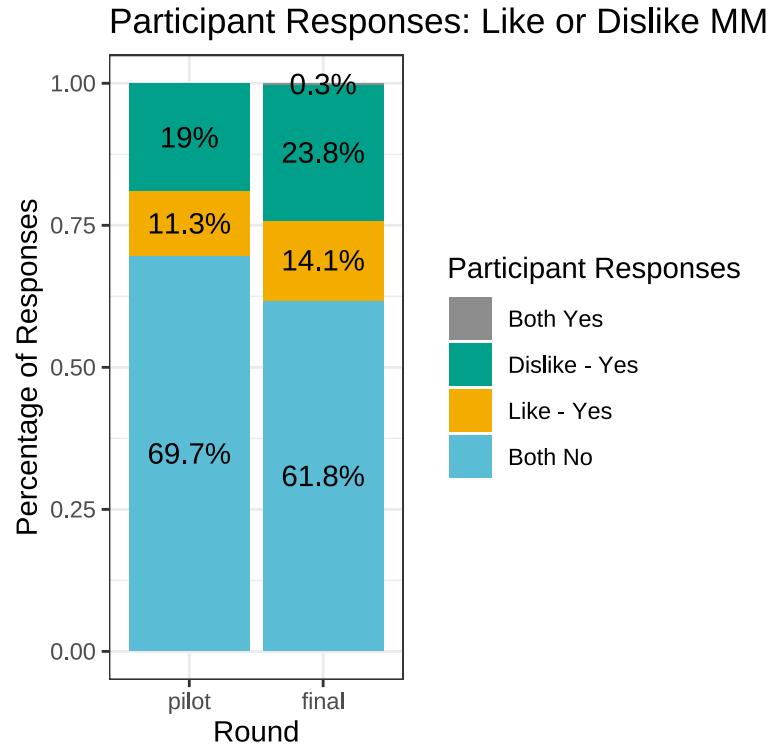


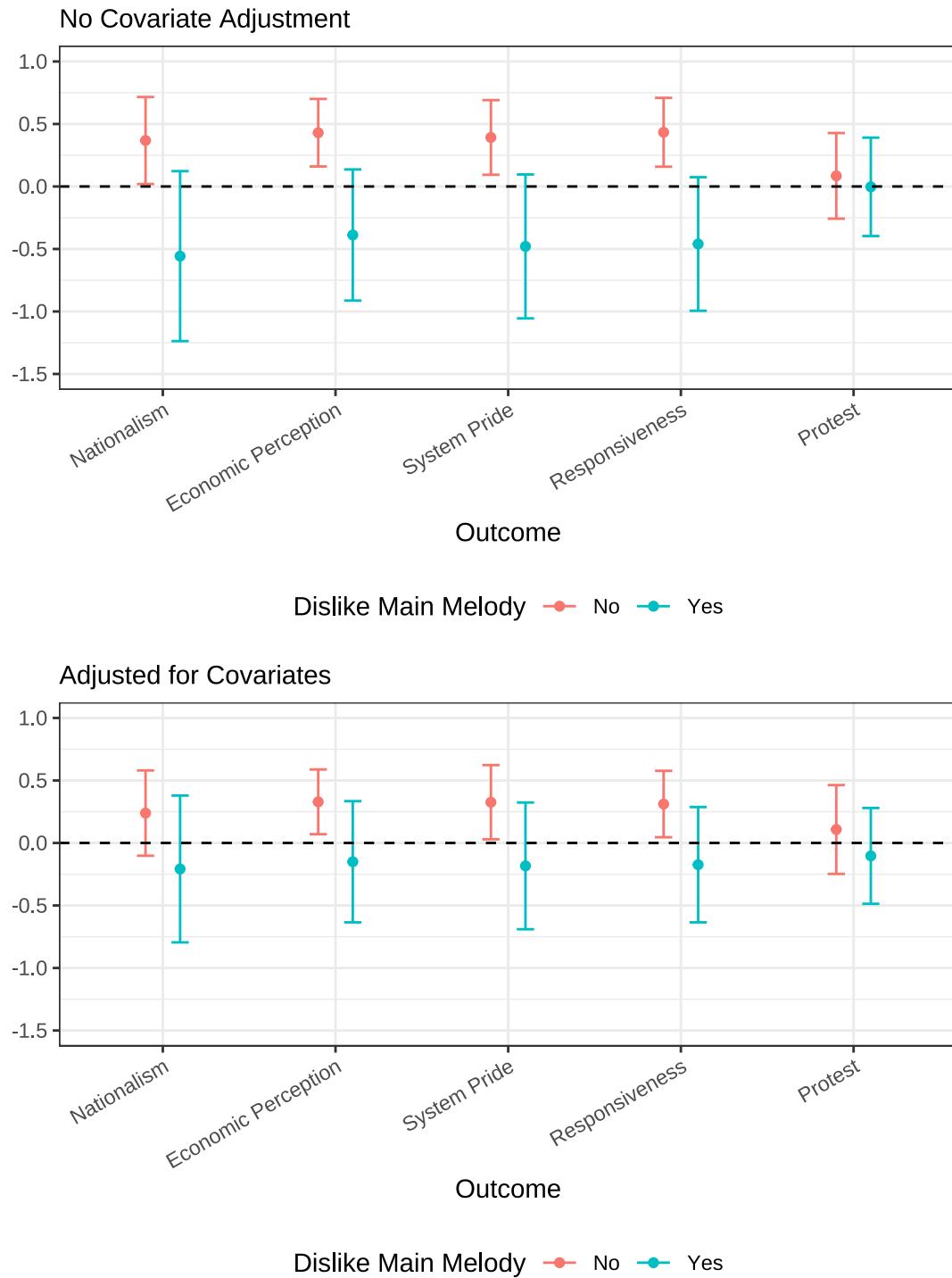
Figure 21: Changes in Preferences for Propaganda Movies

#### A.4 Who dislikes propaganda movies

Table 6: Who Dislikes Propaganda Movies?

|                      |         |
|----------------------|---------|
| (Intercept)          | 0.474*  |
|                      | (0.193) |
| Gender               | -0.026  |
|                      | (0.049) |
| Age                  | -0.002  |
|                      | (0.004) |
| Education            | -0.009  |
|                      | (0.023) |
| City                 | -0.017  |
|                      | (0.020) |
| Income               | 0.006   |
|                      | (0.005) |
| Overall Satisfaction | -0.028  |
|                      | (0.026) |
| Num.Obs.             | 360     |

## A.5 CACEs



Note: Covariates include gender, age, education, city, income, overall satisfaction.

Figure 22: Estimated CACEs

## A.6 Covariate Imbalance

Table 7: Balance of covariates

|                                  | Gender              | Age                  | Education           | City                | Income              | Party Af-filiation  | Overall Satisfac-tion |
|----------------------------------|---------------------|----------------------|---------------------|---------------------|---------------------|---------------------|-----------------------|
| <i>Panel 1: All Participants</i> |                     |                      |                     |                     |                     |                     |                       |
| (Intercept)                      | 1.302***<br>(0.040) | 24.633***<br>(0.584) | 4.309***<br>(0.092) | 2.288***<br>(0.100) | 4.813***<br>(0.401) | 2.079***<br>(0.091) | 3.266***<br>(0.078)   |
| Treatment                        | 0.046<br>(0.059)    | 0.263<br>(0.869)     | 0.099<br>(0.136)    | 0.277+<br>(0.148)   | -1.109+<br>(0.595)  | -0.123<br>(0.135)   | 0.134<br>(0.116)      |
| Num.Obs.                         | 254                 | 254                  | 254                 | 254                 | 254                 | 254                 | 254                   |
| <i>Panel 2: Dislike MM - No</i>  |                     |                      |                     |                     |                     |                     |                       |
| (Intercept)                      | 1.303***<br>(0.048) | 24.838***<br>(0.711) | 4.253***<br>(0.107) | 2.323***<br>(0.121) | 4.404***<br>(0.446) | 2.030***<br>(0.108) | 3.212***<br>(0.092)   |
| Treatment                        | 0.075<br>(0.069)    | -0.272<br>(1.030)    | 0.247<br>(0.155)    | 0.266<br>(0.175)    | -0.760<br>(0.646)   | -0.053<br>(0.156)   | 0.277*<br>(0.133)     |
| Num.Obs.                         | 189                 | 189                  | 189                 | 189                 | 189                 | 189                 | 189                   |
| <i>Panel 3: Dislike MM - Yes</i> |                     |                      |                     |                     |                     |                     |                       |
| (Intercept)                      | 1.300***<br>(0.072) | 24.125***<br>(1.008) | 4.450***<br>(0.178) | 2.200***<br>(0.174) | 5.825***<br>(0.865) | 2.200***<br>(0.173) | 3.400***<br>(0.143)   |
| Treatment                        | -0.060<br>(0.116)   | 1.955<br>(1.625)     | -0.370<br>(0.287)   | 0.280<br>(0.281)    | -1.905<br>(1.395)   | -0.320<br>(0.278)   | -0.320<br>(0.230)     |
| Num.Obs.                         | 65                  | 65                   | 65                  | 65                  | 65                  | 65                  | 65                    |

## A.7 Covariate Adjustment

Table 8: Effects of Propaganda Movie on Opinions: Adjusted for Covariates, All Participants

|                      | Nationalism         | Economic Perception | System Pride        | Perceived Responsiveness | Willingness to Protest |
|----------------------|---------------------|---------------------|---------------------|--------------------------|------------------------|
| (Intercept)          | -0.795<br>(0.500)   | -0.788*<br>(0.358)  | -0.930*<br>(0.408)  | -1.031**<br>(0.366)      | 0.588<br>(0.430)       |
| Treatment            | 0.071<br>(0.127)    | 0.137<br>(0.089)    | 0.109<br>(0.102)    | 0.131<br>(0.091)         | 0.082<br>(0.107)       |
| Gender               | 0.025<br>(0.131)    | 0.182+<br>(0.093)   | 0.103<br>(0.106)    | 0.153<br>(0.095)         | -0.107<br>(0.111)      |
| Age                  | -0.012<br>(0.010)   | -0.016*<br>(0.007)  | -0.006<br>(0.008)   | -0.012<br>(0.008)        | -0.013<br>(0.009)      |
| Education            | -0.051<br>(0.059)   | -0.061<br>(0.043)   | -0.021<br>(0.049)   | 0.000<br>(0.044)         | 0.015<br>(0.052)       |
| City                 | -0.015<br>(0.056)   | -0.017<br>(0.039)   | -0.031<br>(0.044)   | -0.033<br>(0.040)        | -0.030<br>(0.046)      |
| Income               | 0.000<br>(0.015)    | -0.002<br>(0.011)   | 0.010<br>(0.012)    | 0.002<br>(0.011)         | -0.003<br>(0.013)      |
| Party Affiliation    |                     | 0.064<br>(0.042)    | 0.001<br>(0.048)    | 0.059<br>(0.048)         | 0.013<br>(0.051)       |
| Overall Satisfaction | 0.378***<br>(0.068) | 0.303***<br>(0.048) | 0.302***<br>(0.055) | 0.308***<br>(0.049)      | -0.060<br>(0.058)      |
| Num.Obs.             | 217                 | 219                 | 219                 | 219                      | 219                    |

Table 9: Effects of Propaganda Movie on Opinions: Adjusted for Covariates, Dislike MM - No

|                      | Nationalism         | Economic Perception | System Pride        | Perceived Responsiveness | Willingness to Protest |
|----------------------|---------------------|---------------------|---------------------|--------------------------|------------------------|
| (Intercept)          | -0.488<br>(0.540)   | -0.387<br>(0.375)   | -0.520<br>(0.439)   | -0.798*<br>(0.388)       | 0.482<br>(0.531)       |
| Treatment            | 0.234<br>(0.142)    | 0.257**<br>(0.098)  | 0.247*<br>(0.115)   | 0.241*<br>(0.101)        | 0.085<br>(0.139)       |
| Gender               | -0.030<br>(0.142)   | 0.135<br>(0.098)    | 0.071<br>(0.115)    | 0.100<br>(0.101)         | -0.034<br>(0.139)      |
| Age                  | 0.003<br>(0.012)    | -0.013<br>(0.008)   | 0.004<br>(0.010)    | -0.005<br>(0.008)        | -0.018<br>(0.012)      |
| Education            | -0.091<br>(0.067)   | -0.114*<br>(0.048)  | -0.077<br>(0.056)   | -0.045<br>(0.050)        | -0.002<br>(0.068)      |
| City                 | 0.007<br>(0.060)    | -0.023<br>(0.040)   | -0.030<br>(0.047)   | -0.011<br>(0.042)        | -0.030<br>(0.057)      |
| Income               | -0.013<br>(0.020)   | 0.003<br>(0.013)    | 0.010<br>(0.015)    | 0.007<br>(0.013)         | 0.001<br>(0.018)       |
| Party Affiliation    |                     | 0.089+<br>(0.046)   | -0.013<br>(0.054)   | 0.054<br>(0.048)         | 0.041<br>(0.065)       |
| Overall Satisfaction | 0.259***<br>(0.076) | 0.241***<br>(0.053) | 0.210***<br>(0.062) | 0.257***<br>(0.054)      | -0.015<br>(0.074)      |
| Num.Obs.             | 157                 | 159                 | 159                 | 159                      | 159                    |

Table 10: Effects of Propaganda Movie on Opinions: Adjusted for Covariates, Dislike MM - Yes

|                      | Nationalism        | Economic Perception | System Pride       | Perceived Responsiveness | Willingness to Protest |
|----------------------|--------------------|---------------------|--------------------|--------------------------|------------------------|
| (Intercept)          | -0.528<br>(1.173)  | -1.151<br>(0.977)   | -1.405<br>(1.001)  | -0.477<br>(0.918)        | 1.687*<br>(0.764)      |
| Treatment            | -0.287<br>(0.261)  | -0.119<br>(0.201)   | -0.143<br>(0.206)  | -0.135<br>(0.189)        | -0.088<br>(0.157)      |
| Gender               | -0.129<br>(0.296)  | 0.117<br>(0.228)    | -0.061<br>(0.233)  | 0.069<br>(0.214)         | -0.407*<br>(0.178)     |
| Age                  | -0.027<br>(0.023)  | -0.016<br>(0.018)   | -0.015<br>(0.019)  | -0.029+<br>(0.017)       | -0.012<br>(0.014)      |
| Education            | -0.016<br>(0.120)  | 0.010<br>(0.092)    | 0.086<br>(0.095)   | 0.048<br>(0.087)         | 0.029<br>(0.072)       |
| City                 | -0.166<br>(0.125)  | -0.052<br>(0.099)   | -0.076<br>(0.101)  | -0.159+<br>(0.093)       | -0.106<br>(0.077)      |
| Income               | 0.003<br>(0.026)   | -0.013<br>(0.020)   | -0.003<br>(0.021)  | -0.008<br>(0.019)        | 0.003<br>(0.016)       |
| Party Affiliation    |                    | 0.014<br>(0.095)    | 0.042<br>(0.097)   | 0.049<br>(0.089)         | -0.077<br>(0.074)      |
| Overall Satisfaction | 0.483**<br>(0.157) | 0.392**<br>(0.121)  | 0.426**<br>(0.124) | 0.303*<br>(0.113)        | -0.213*<br>(0.094)     |
| Num.Obs.             | 60                 | 60                  | 60                 | 60                       | 60                     |

## A.8 Covariate Adjustment: Graph

The figure below presents a comparison of the estimates with and without covariate adjustment. As the treatment groups were unbalanced, the estimated effects were found to be smaller after controlling for covariates. However, the overall pattern of results remained consistent.

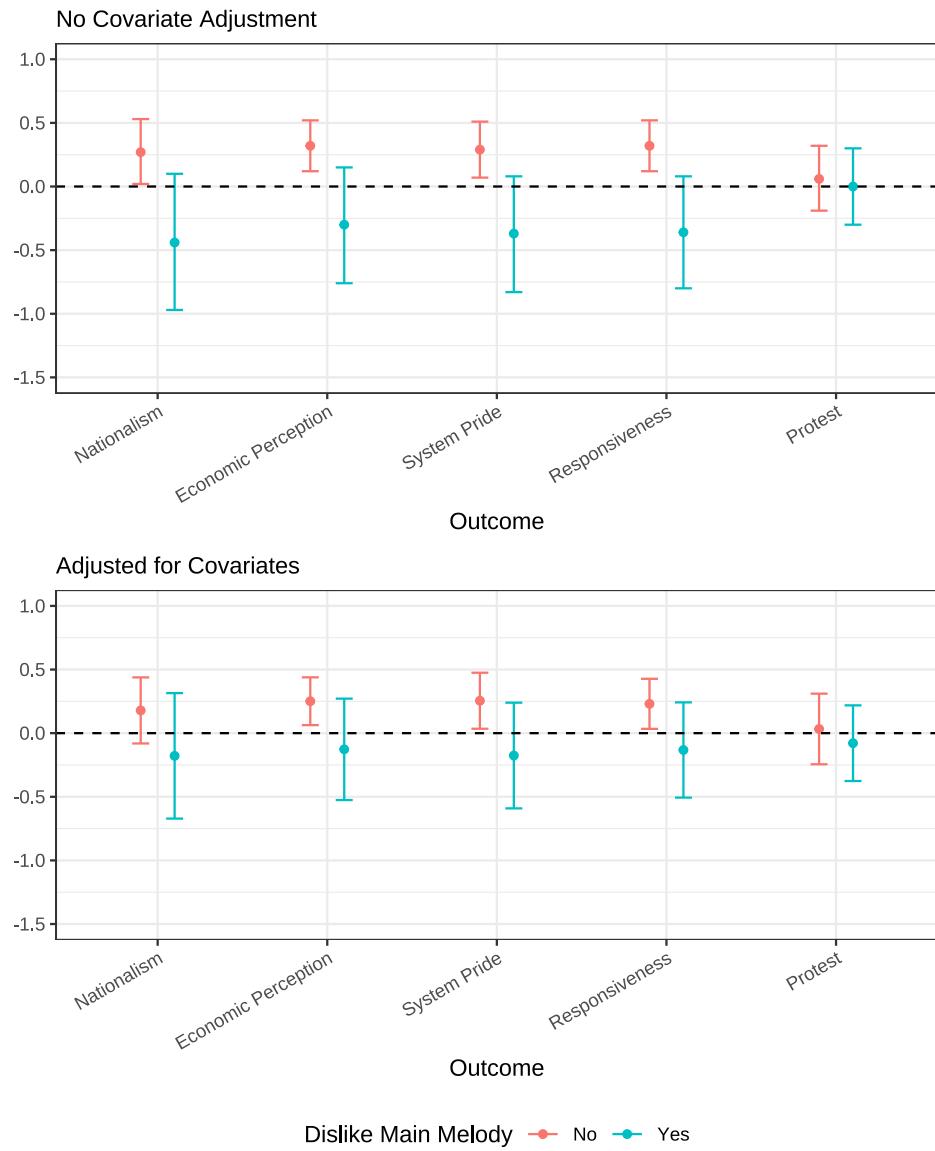


Figure 23: No Covariate Adjustment Versus Adjusted for Covariate

## A.9 Who Chooses the Propaganda Movie in the Free-choice Group

Table 11: Who Chooses the Propaganda Movie?

|                      |                   |
|----------------------|-------------------|
| (Intercept)          | 0.741<br>(0.544)  |
| Gender               | -0.097<br>(0.108) |
| Age                  | -0.010<br>(0.010) |
| Education            | 0.082<br>(0.058)  |
| City                 | -0.050<br>(0.048) |
| Income               | -0.014<br>(0.013) |
| Overall Satisfaction | 0.033<br>(0.065)  |
| Num.Obs.             | 92                |

### A.10 ITT effects

Table 12: ITT effects

| term                             | Nationalism       | Economic Perception | System Pride      | Responsiveness    | Protest           |
|----------------------------------|-------------------|---------------------|-------------------|-------------------|-------------------|
| (Intercept)                      | -0.052<br>(0.083) | -0.107+<br>(0.059)  | -0.052<br>(0.070) | -0.053<br>(0.063) | -0.062<br>(0.069) |
| Treatment:<br>Forced<br>Exposure | 0.114<br>(0.123)  | 0.175+<br>(0.097)   | 0.137<br>(0.105)  | 0.166+<br>(0.098) | 0.055<br>(0.104)  |
| Treatment:<br>Free-Choice        | 0.036<br>(0.125)  | 0.158+<br>(0.086)   | 0.026<br>(0.102)  | 0.006<br>(0.105)  | 0.160<br>(0.107)  |
| Num.Obs.                         | 309               | 311                 | 312               | 312               | 312               |

### A.11 Self-selectors and non-selectors

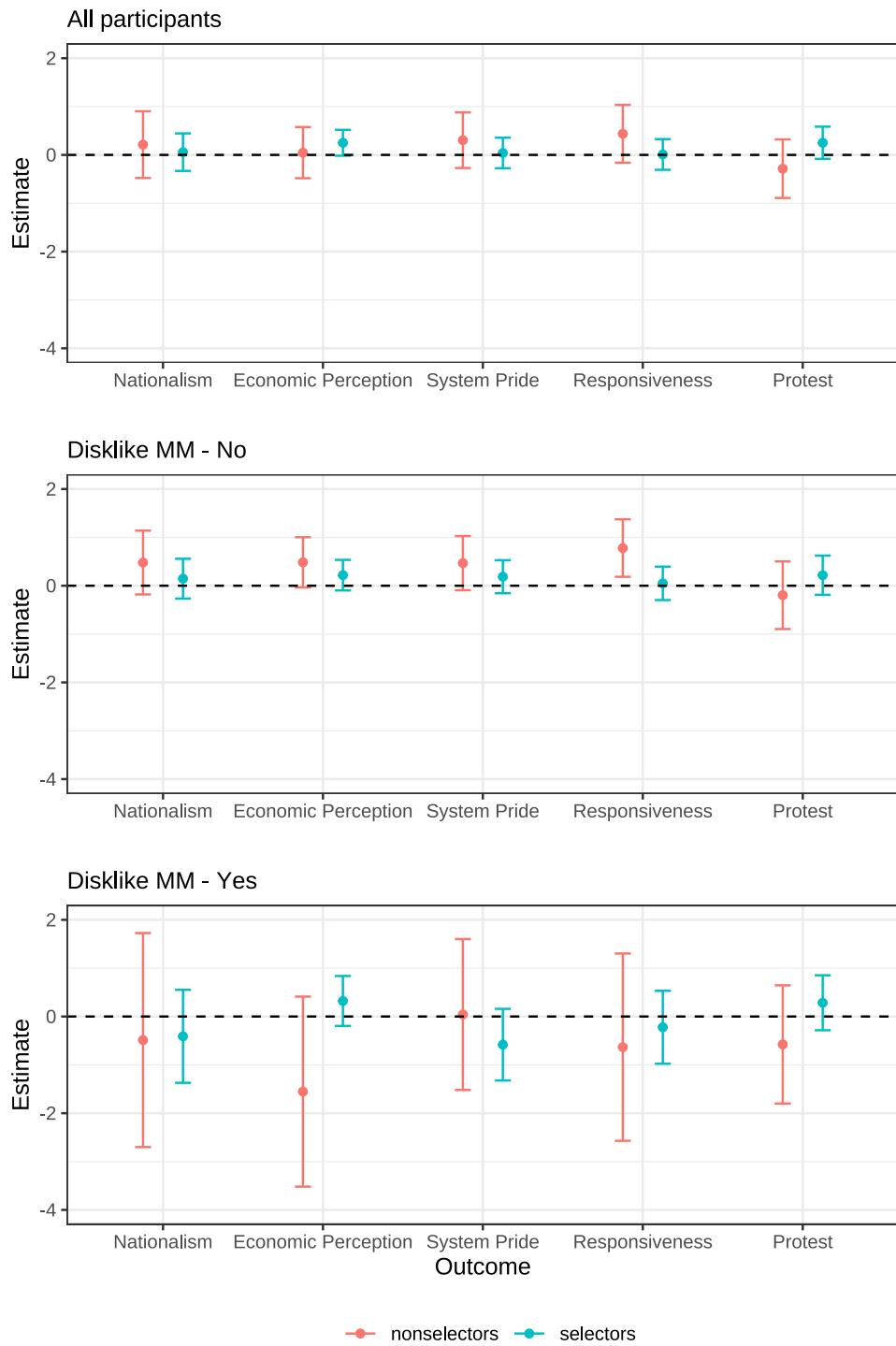


Figure 24: Estimated Treatment Effects Among Selectors and Nonselectors

#### A.12 Estimated Heterogeneous Treatment Effects By Overall Satisfaction

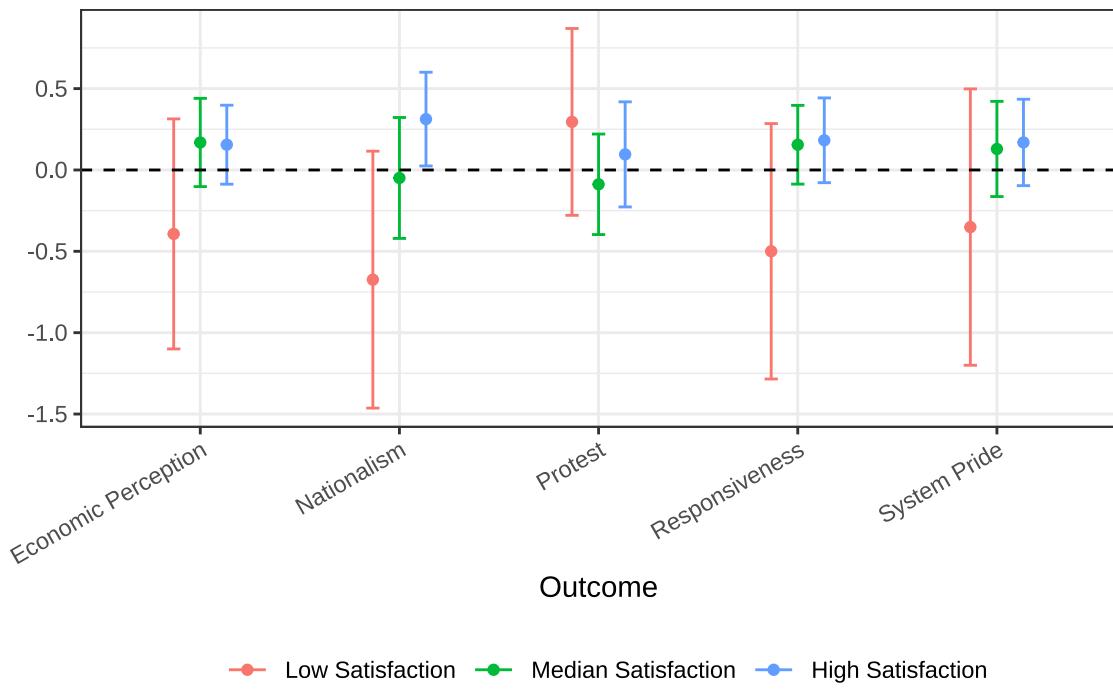


Figure 25: Estimated Heterogeneous Treatment Effects By Overall Satisfaction

### A.13 Estimated Heterogeneous Treatment Effects By Movie-Watching Frequency

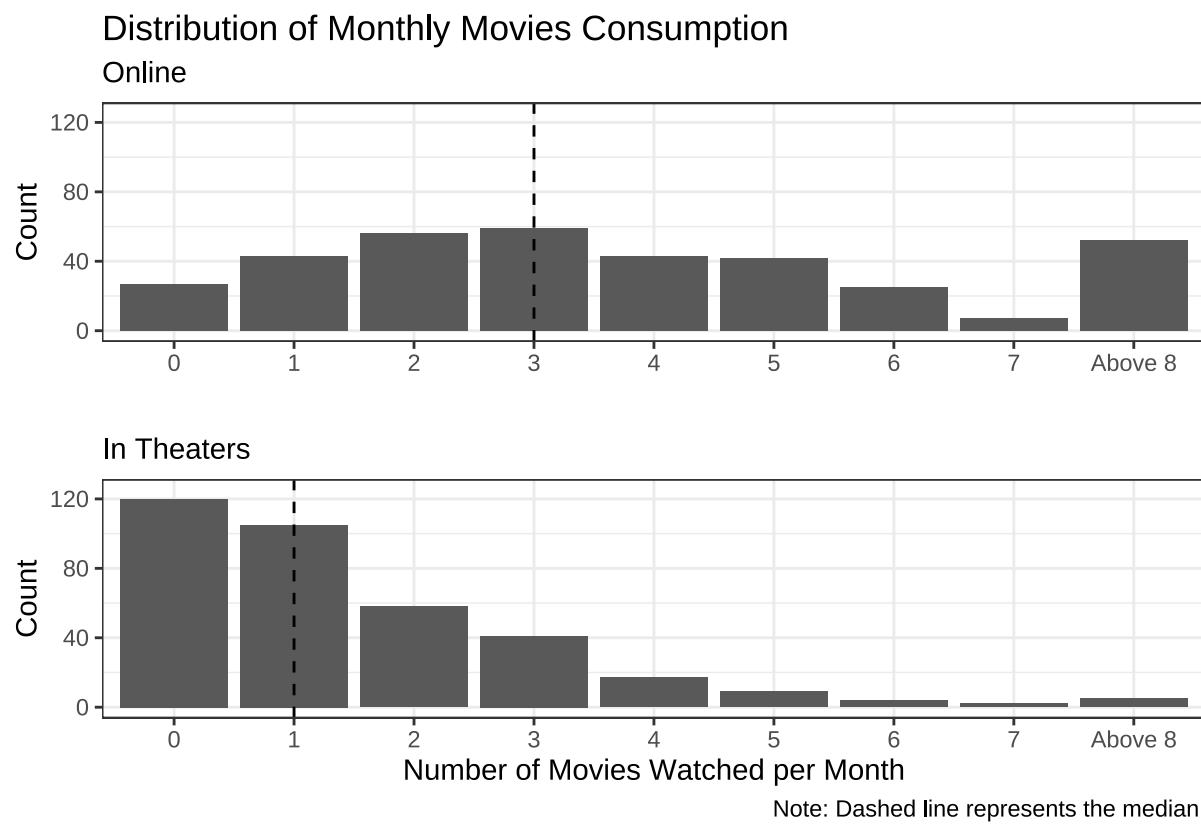


Figure 26: Distribution of Movie-Watching Frequency

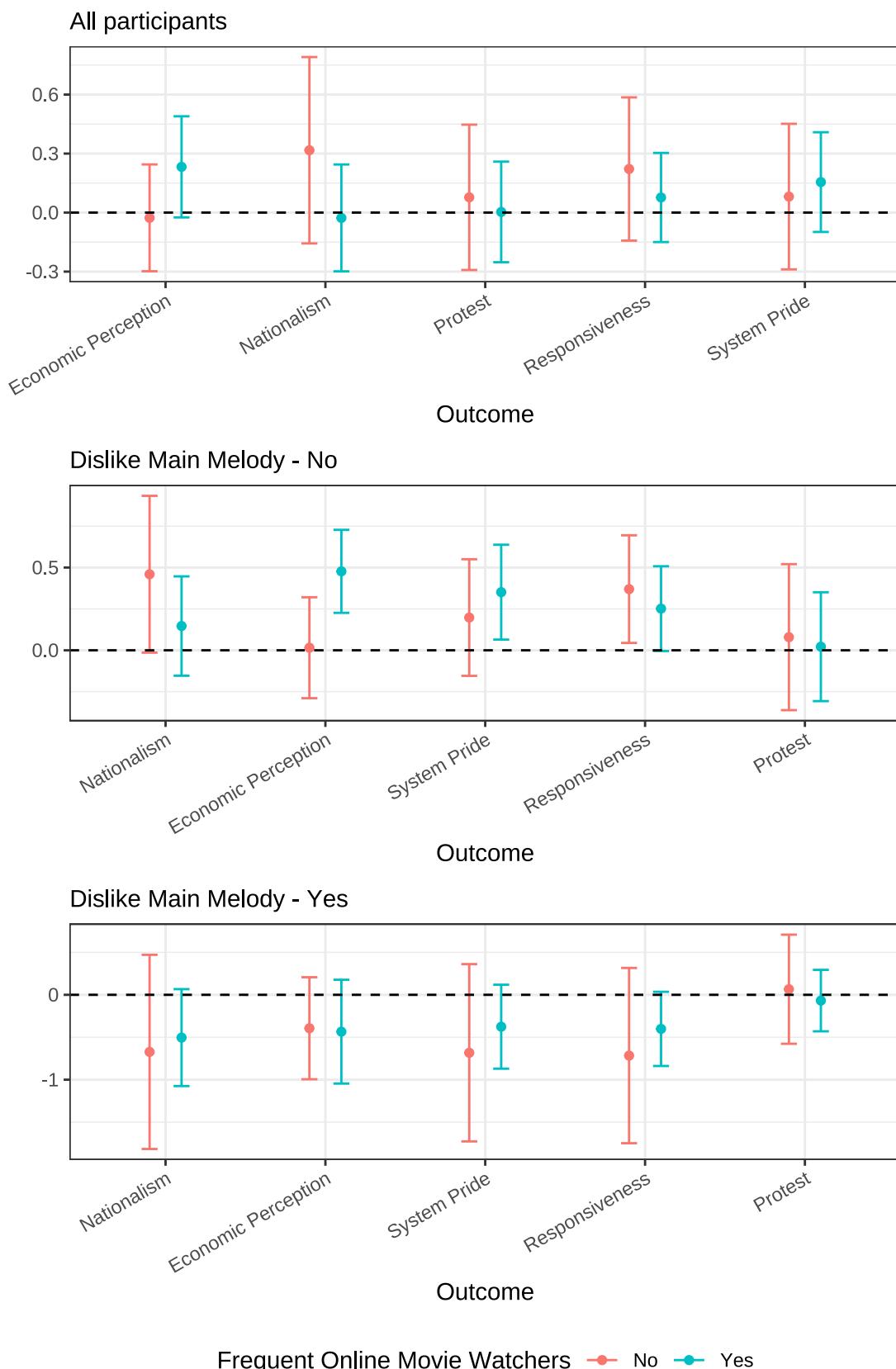


Figure 27: Estimated Treatment Effects By Online Movie-Watching Frequency  
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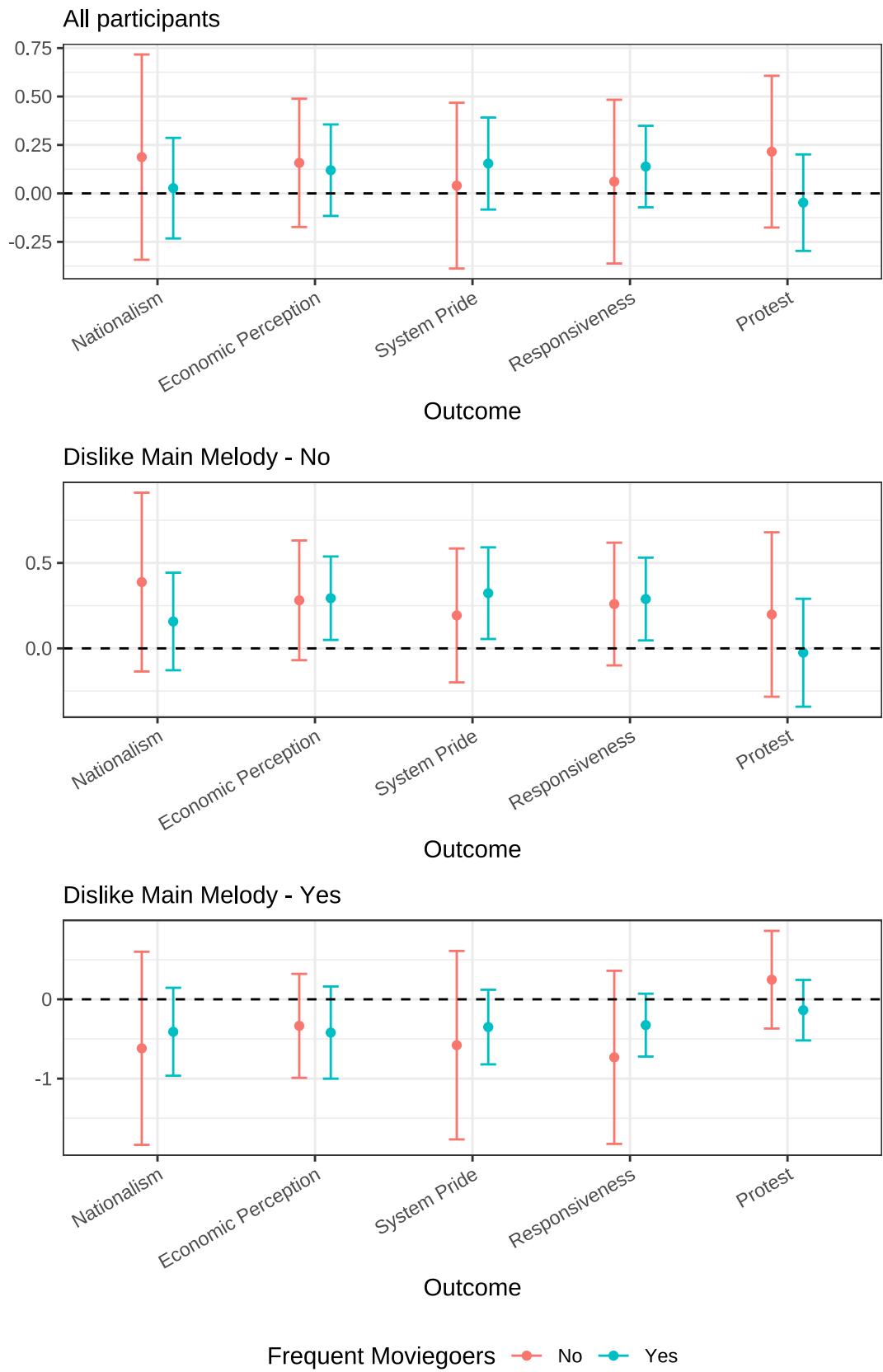


Figure 28: Estimated Treatment Effects By Movie-Going Frequency  
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#### A.14 Movie Ratings

