War and development of gender norms:

Case of Ukraine

By

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Abstract

This research explores the impact of war on gender norms in Ukrainian society, focusing on the ongoing conflict started in February 2022. The research aims to investigate whether the war has influenced people's attitudes towards gender norms, specifically examining the role of emotions and the representation of women in the military. The study utilizes a combination of web-scraping methods for analyzing attitudes in Ukrainian Telegram channels and a survey experiment distributed on Facebook. Sentiment analysis and linear regression analysis are employed to analyze the data. The findings partially support the hypotheses, indicating that specific emotions, such as anger, play a role in shaping attitudes towards gender norms during war. Additionally, the research reveals regional variations in the effects of war on gender norms, with differences observed between regions closer to the war zone and those further away. While explicit attitudes towards gender norms did not show a significant effect, implicit attitudes were influenced by the representation of women in the military. The study contributes to the understanding of the complex relationship between war and gender.

Contents

iv

List of Figures

List of Tables

1 Introduction

Given the growing importance of global security and peacekeeping, study of War becomes popular in all disciplines not necessarily closely related to the military itself. Recently, social scientists favour studying processes triggered or followed by War, as armed conflicts change all spheres of people's lives and even the world order. One of the areas that are highly influenced by War is gender norms in the society.

Because of the extensive research in the topic during past 30 years, war is already known to be a deeply gendered concept. Different concept are discussed in the interconnection of gender and war: images of masculinity and femininity in the military spheres, womenandchildren (Enloe 2014) as main victims of war, women emancipation during the civil wars and many others.

Unfortunately, these discussions are still of current interest with many wars and smaller armed conflicts happening around the world. In this work I would like to draw attention to the War in Ukraine that started in February 2022. Even though Russian aggression has started much earlier, this massive invasion was the catalyst of large social changes in the society. Bombed cities, brutal violence, endless battles and evacuations and many other shocking events undoubtedly influenced the society, militarizing it.

As each country and time interval have their own specifics, this militarization can vary drastically. My academic interest lies on the intersection of gender relations and norms, and militarization of the society. Massive foreign aggression and national war definitely has an impact on the Ukrainian society, and the gender issues are also part of it.

From the social media and news agenda it is easy to notice that women became more visible since the beginning of the war even in the international news. Even though it is not an entirely new phenomena for the local civil society, as Ukrainian women were a very strong power during the Revolution of dignity (2014), it is still impactful enough to become an important discussion both in general and especially in feminist circles. During the current war women are mobilised: many new NGOs are launched by women, fund-raising, media, data collection projects and many more are created by women to invest into the fight for the country. What less ordinary is women's active participation in the military forces, especially in combat positions.

Starting from 2015 the advocacy project called "Invisible battalion" was very active, re-

searching and documenting participation of Ukrainian women in the armed conflict against Russian troops. One result of their work is the Law of Ukraine "On Ensuring Equal Rights and Opportunities for Women and Men during Military Service in the Armed Forces of Ukraine and Other Military Formations", which was passed in 2018. This law enables women to be officially employed by Ukrainian army not only on the caring positions, but also combat ones.

Since the beginning of the massive invasion by Russian forces in Ukraine more and more women started to use the opportunity provided by this law and join the army. This could be a sign of a social change and spilled over to a shift in attitudes towards gender roles across the society. I formulate my research question for this project as:

Does war change people's attitudes towards gender norms in the society?

My theoretical expectation is that the war in Ukraine has influenced attitudes towards gender norms, making them more progressive. It will be followed by my two main hypotheses and subhypotheses:

Hypothesis 1: Experiencing certain emotions during the war leads to change in attitudes towards gender norms.

Hypothesis 1.a : Experiencing anxiety, caused by war, leads to change in attitudes towards gender norms to more progressive.

Hypothesis 1.b : Experiencing anger, caused by war, leads to conservation of attitudes towards gender norms.

Hypothesis 2. The higher representation of women in the military leads to change of attitudes towards gender norms to more progressive.

To answer my research question, I will work with theory in the fields of political behaviour and psychology, gender studies and military studies. As methods of data collection, first, I will use web-scraping for studying attitudes in Ukrainian Telegram channels, and survey-experiment, which I distributed on Facebook. Data from Telegram will be analysed through sentiment analysis, specifically dictionary methods. The results of the survey-experiment will be then processed with linear regression analysis.

The main results of the study are summarized as follows: the findings provide practical support for both hypotheses. There is empirical evidence that attitudes towards gender norms

are effected by war related emotions, even though significant support for existence of relation between anxiety and feminist attitudes were not found. But there is a proof for the theoretical assumption that anger, and anger in pair with anxiety, indeed can not only conserve the attitudes towards gender norms, but even trigger a shift in direction of more conservative perspectives.

The important finding of the research is that the effect of war varies in terms of which regions exactly is in question. The evidences for the different effect between the regions closer to the war front and further was found for both hypotheses. For the first hypothesis more conservative trends were revealed - being exposed to both anxiety and anger people from the regions that are closer to the battlefields showed more conservative attitudes towards gender norms.The opposite effect was found for the people living in the less exposed to military actions regions - these people showed raise in more feminist explicit attitudes towards gender norms.

Testing the second hypothesis showed the decrease in the explicit feminist attitudes towards gender norms in the regions, which were close to the front line. But implicit attitudes appeared to be affected by representation of women in the army and were shifted towards more progressive in the same regions.

This paper consists of five chapters: literature review, theory and hypothesis, research design, data description, and analysis. First, I review the literature on various factors influencing attitudes towards gender norms and interconnection between war and feminist attitudes. Second, I layout the theoretical framework, which is based on emotional evaluation and appraisal theories and the hypothesis that I am going to test. Third, I describe the research design, including operationalization, methodology and data collection. Fourth, I make an overview of the data and provide descriptive statistics together with manipulation and balance checks. Finally, I present and discuss the main results of analysis and conclude the paper.

2   Literature review

I will start with the addressing general classification of factors that may influence the attitudes towards gender norms. After it I will discuss the factors itself and how they can operate. Then, the interconnection between war and gender in the literature will be overviewed.

I would like to start with the classification presented by Bolzendahl and Myers (2004). They divide all the factors that influence gender attitudes into two groups: interest-based and exposure-based factors. The first group is characterized by the fact that people have those attitudes that benefit them and corresponding with their personal interests. For example, women may have more feminist attitudes because they themselves will be benefiting from the specific order. More concrete example would be equal level of salaries for women and men. The employment factor (if the woman is employed) will influence her attitudes in more progressive way because she will be the one benefiting from the equality in this sense. And this effect will not be the same for women who are not on the labor market (Davis and Robinson 1991).

Exposure-based factors are connected to any personal experience that can illuminate the social problems concerning women' position in the society. This event can be experienced by the person directly, or the one can be just a witness of the situation. As in the previous example we may also use the employment situation. If a woman works (rather than stay at home for a long time) she has higher chances to be exposed to the discrimination from the colleges of structures of management (Bolzendahl and Myers 2004). When she has this experience there are higher chances that she will appropriate more feminist attitudes, just because she has a possibility to find out that this problem exists in practice and moreover was directly exposed to it. The factors influencing attitudes towards gender norms may be the same in both approaches.

The most common predictors for change are demographic factors and age and gender are among them. Valentova (2013) in her study on Luxembourg revealed that over the years (from 1999 ro 2008) the biggest support for more egalitarian perspective on labor market had young women. Young men expressed much less enthusiasm about it, and overall, the age gap in attitudes was noticed. Even though women in general had more egalitarian views than men, in comparison with young people old people were more traditional in their sex group.

Another group of factors that matter - education and employment status. First, the process

of education may be very impactful in terms of development of critical thinking and provokes thought about gender stereotypes and gender order Rhodebeck (1996). Second, education may play the role of social lift and give a chance to build careers and have job aspirations. As for employment status that was already briefly discussed above, there are various aspects of its effect on the experience and, hence, attitudes of people. For example, Plutzer (1991) emphasizes that men in the families with working wives have more feminist attitudes than those whose spouses are homemakers. The author also notices that the marital status by itself is very important predictor of attitudes towards gender roles.

Apart from mentioned above there are two more the most frequent factors that usually have many attention in the topic - religion and pop culture. In case of religion, it can impact the attitudes both in terms of person being religious or atheist (also whether one had experience with religion in the past, and in the light of different denomination Ruiz et al. (2017).

Pop culture has influence on the perception and development of attitudes towards gender roles. On the one hand, it has a big industry of discrimination and sexism. That can be very extreme in some situation, for example the most frequently discussed fields of video games, TV series or anime cartoons Robinson (2021). Or it can be just imprudent gender stereotypes, deeply rooted in the social culture (Milestone and Meyer 2020).

Above I have discussed the most commonly mentioned factors that can be predictors for more conservative or progressive attitudes towards gender roles, but there are more of them. It can be ethnicity or cultural background, urban or rural setting, neighborhood and type of primary school, etc. There are many approaches to attempt to explain what exactly matters and why people can have such different views.

The main idea about these common factors is that the effect on attitudes they have can be characterized as routine and slow. These factors are influencing (one way or another) people's viewpoints on a daily basis, they are being incorporated to the routine and life circle of every person. So if some factors are present from the birth or being acquired during life time (like education or job) they will be influencing one's attitude slowly. But what is the situation with other type of factors, that can effect people's opinions out of sudden and more dramatically? Moreover, it can be less individual impact but rather social/collective, which can be more widespread.

In this case we can talk about events that can change lives of the society quite rapidly. It can be natural disaster, terrorist attack or started armed conflict. In the light of our topic it is important to talk about a war as a factor of change in people's political attitudes and specifically, their perception of gender roles.

The common factors of change are discussed often because they are applicable for the peace time. Despite the fact that the same factors can be important during the armed conflict too, I propose different logic of change. The condition of war may be by itself the factor of change in the attitudes towards gender roles, because the order of life for majority of people becomes dramatically different from those one before. It can reveal new approaches to the issue of change in attitudes towards gender roles.

The phenomena of defensive war could be put in the classification of Bolzendahl and Myers (2004) . On the one hand, a war may create interest in more egalitarian social order not only for women, but for many members of the society. There is a necessity to defend and overcome aggression and the chances of it become higher with the inclusion of women in this battle. As interest-based factors are usually concentrated on the present situation (Bolzendahl and Myers 2004) the war can be this factor when it is ongoing. On the other hand, it also can be exposure-based factor in the post-war period as this type of factors are concentrated more on the past. The possible situation is that people have some experience and raised awareness (exposure) during the war that will change their perception in the long-run.

The topic of interconnection of war and gender is not new. Nowadays, War is fairly taken as a gendered concept. Cynthia Enloe has extensive research on this intersection, including international politics and role of women in the armed conflicts Enloe (2000). According to Carol Cohn, culture, structure and even the language of the army are built on gender dichotomy and stereotypes (Cohn (2000)). Judith Butler dedicated their work towards studying femininity and masculinity and the way how they are constructing the nature of militaristic behaviour.

There are many examples of how the war can be gendered: the depiction of soldiers as men with quite definite behaviour which manifests the strength, bravery, reliability, etc; the opposition of soldiers in army to womenandchildren (Enloe 2014)and expectation of obvious labour division during the armed conflict. "The gendering" of war is happening on several levels –

6

it can be discourse of political elites, sensations and feelings of the citizens themselves, con-struction of legal institutions, etc. In the end, when we work with intersection of such pervasive fields as both war and gender, we will find ourselves surrounded by the vast number of various layers and topics.

In this light the issue of women in the war, their role and image even not being the new topic on the agenda is still quite appealing on the one hand, but still unexplored on the other. Some scholars are focusing on the women as main victims of the armed conflicts – sexual violence, abandonment by breadwinners who are going to the front, psychological consequences of the war experienced by their partners, etc Rittner and Roth (2012). Others focus more on women as an active part of the militarized society, their roles, rights and duties. This division echoes with the difference in the opinions of feminists on the issue of war: some of them claim that the war itself is antifeminist and women should do everything to stay away from this patriarchal creation, while others claim that military is existent part of the society and gender equality would mean inclusion of women in this sphere too.

If we are talking about the interconnection between gender and war, the topic of women as the one who suffer the most from it will appear immediately. It is mainly about different form of violence, especially sexual violence, legal perspectives and strategies for prevention of it. When men are trained to be soldiers and fight, women sometimes have to either leave the country with kids to save the family or to defend themselves in case the rival army came to the settlement, etc. "Women are often at the heart of war, but usually not as soldiers" (Merry 2011) - it signifies the main difference of women's experience of war from men's. Conventionally, women are not the usual part of army and therefore do not have experience and skills to be ready to fight back. Apart from death that is the following almost every war, women are subjected to fleeing, rape and conversion to sexual slaves (Merry 2011). This block of literature focuses a lot on the different experiences of women from war rather than men. It impact the knowledge both from the perspective of women's studies and military studies. As for the last one, the perspective of women's experience during the war leads to the creation of the concept "rape as a weapon of war" (Rittner and Roth 2012).

In their research Webster, Chen, and Beardsley (2019) discuss some possible reasons for

7

woman's emancipation during the war: militarization of the economy, changes in demography, social and political orders. The scholars found support for the fact, that war indeed may "shake up" established social and political norms and give a chance for woman's empowerment. However, this study also illuminated that this change is usually not very sustainable and does not last long, there is a backlash in the perception of gender roles in the post-war period.

Another block of scholarship discusses the consequences of the war for women in post-war time: economic inability to provide the family because of the lost of the breadwinner, loss of job because of the shortening of military production, domestic violence from the partners with PTSD, etc. Hartmann (1978).

The same time there is a body of scholarship which claim the war's ability to reinforce the conservative views on the gender roles. For example, Sjoberg (2013) discusses reproduction and strengthening of gendered understanding of power during the war and structural gender inequality. Cockburn (2013) addresses the role of masculinity in militarization of the economy and social order, looking consequently at three stages of war: preparation, ongoing conflict and post-war period. She pays specific attention to the ways the military spirit is exploiting masculinity and patriarchal norms for the purposes of war.

Overall, even though, the attention towards the change in attitudes towards gender roles and norms during the war is present, I find the explanation of the reasons for it not exhaustive. Even though Webster, Chen, and Beardsley (2019) delivered very wide explanation and testing for the possible reasons of woman's empowerment and hence the change in the perception of gender roles and norms, I think there is a vast field of mechanisms that possibly could lead to the change in the attitudes in question during the war.

The conclusion drawn by Webster, Chen, and Beardsley (2019) regarding the ephemeral nature of the changes induced by war holds significant importance. Even though the mechanisms presented by the authors are very common and will be in place in almost every armed conflict, they are rather about the external factors (such as new type of economy, new rules and routines, etc) than personal experiences. I find the gap in the literature in terms of variety of possible mechanisms and personal experiences that can lead to the increase in more feminist attitudes towards gender roles. I find it important, because there are other factors and their types that can

provoke the same process of change, but have different long-term consequences . For example, the viability of this social change in the post-war period.

3   Theory and hypotheses

To explore the topic I have chosen theoretical framework mainly from the fields of political behavior, political psychology and public policy, the reasoning for which I will provide later. Overall, my study will be focusing on the way how people make judgments and what and how exactly can effect this process. I formulate my research question as following:

Does war change people's attitudes towards gender norms in the society?

My theoretical expectation is that the change in the daily life of people caused by the war may pull the shift in their attitudes towards gender norms in the society. Following that, there should be something specific about the war that can results in this effect. Based on this assumption I will draw two hypothesis of my research, but before I will discuss the key concepts that will be used in the paper.

One of the key concepts of this research will be gender norms. By gender norms I mean behaviors, attitudes, and actions that society considers to be appropriate or inappropriate for a person based on their sex. I will be closely looking at the way how people see these gender norms, what I will refer to as attitudes towards gender norms. I will be looking at the development of the perception of gender norms as a specter, where on the one end of the specter the conservative (patriarchal, traditional) viewpoint is situated and progressive (feminist, egalitarian) on the other end. My theoretical expectation is that the war may shift the societal attitudes towards gender norms from more conservative towards more progressive.

Gender stereotypes can be defined as prevailing societal beliefs or preconceived notions regarding the inherent qualities, attributes, or expected roles associated with individuals of distinct sexes, predominantly focusing on men and women.

In exploring the underlying factors influencing individuals' attitudes towards gender norms in the context of war, an initial point of examination involves perceiving the war as a perceived threat. If we are looking at the individual experience of living through the war, we should consider the factor of emotions and specifically what happens when a person experiences threat constantly. In the connection with threat I want to draw attention to two emotions connected to it : anxiety and anger.

We will understand the anxiety as a response to an external threat, especially a personal

threat, over which the threatened person has little control (Eysenck 1992). Anger happens in response to a negative event that frustrates a personally relevant goal and it intensifies if the event caused by known agent and perceived as unjust and illegitimate ((Carver 2004) , (Lazarus 1991)).

First, we will consider two-channel theory of emotional evaluation, that were developed by Tellegan, Watson, Cacioppo and Marcus George E. Marcus (1988). According to the theory, people evaluate the situation by two channels: one is responsible for evaluation of the degree of novelty in the environment or threat of the situation; the other channel is in charge of deciding whether the execution of the familiar actions, practices and routines will lead to the success or failure. In the light of this theory it means that there is close connection between the evaluation of the level of threat and emotional response to the situation.

In general, it was noted that anxiety has an impact on political attitudes and preferences (George E. Marcus and MacKuen 1993). According to the theory by Huddy, Feldman and Casses (Huddy, Feldman, and Cassese 2007), anxiety may lead to more careful assessment of the situation, more critical evaluation of threat and risks and may lead to higher readiness to change the attitudes in question. Moreover, because anxiety is closely connected to the high levels of uncertainty, the vision of future can be difficult and blurred.

Hence, people may asses the situation of threat as new and unfamiliar, because the War is an extreme example for the people of the region. The assessment of the situation as unfamiliar situation may lead to the evaluation of the routine actions as a failure. For the sake of safety and assessing the unfamiliar situation people may start to be more critical towards the situation and reevaluate their attitudes towards gender norms. Specifically, less strict separation between women's and men's roles may become a result of this revaluation.

We may imagine an example of this process. The person evaluates the war as a threat and asses it as an unfamiliar situation (if the state of war is not common for the country in question or in the region). Then, the repetition of the familiar routine actions may appear to the person to be a failure. A person experiences anxiety because of uncertainty and becomes more critical towards the information they receive, being attentive even to the things that were considered before as undeniable truth. As a results the reevaluation of the attitudes may happen. In case

11

of war a person for the sake of safety through this process may change their attitudes towards gender norms.

However, even from the simple definition we may draw that anger can be very prevalent emotion during the war. The challenging part is that even though anxiety and anger may appear from the similar or alike situations, they have different and sometimes even opposite consequences.

We will have a closer look at the appraisal theory presented by R. Lazarus (Lazarus 1991). According to it, people feel anger when negative events are a clear and certain, so actions against them seem likely to be successful. Anger, as an opposed to anxiety, may lead to fast judgement and less careful action, underestimation of risks. As anger usually has specific target there is a sense of control of the situation, rather than frustration as in the case of anxiety.

We will also imagine the example of this process. Person experiences war as a threat and sees at as a clear and certain situation. It appraises anger directed towards specific targets (for example, army of the aggressor) and desire for action (Lerner and Keltner 2001) , (Vasilopoulos et al. 2018). Because of the certainty the evaluation system recognizes planned actions as familiar and successful, what is followed by the fast judgement and lower critical thinking. In the connection with attitudes towards gender norms, it can result in the conservation of familiar believes and the absence of change towards more progressive ones.

Overall, we may see that anger and anxiety may be caused by the same situation, but experiencing these two emotions may lead to difference consequences. In our case the effect of anxiety will produce the change of attitudes, and the effect of anger will not. In the Table 1 you can see the comparison table of components of these two emotions:

Table 1: Comparison of the anxiety and anger experience.

Emotion	Appraises in response to	Certainty	Control over situation	Critical thinking	Evaluation of situation	Result	Target
Anxiety	External threat	No	No	Yes	Failure of familiar action	Possible reevaluation of attitudes	No

Emotion	Appraises in response to	Certainty	Control over situation	Critical thinking	Evaluation of situation	Result	Target
Anger	Negative event, perceived and unjust and illegitimate	Yes	Seems like yes	No	Success of familiar action	Conservation of attitudes	Yes

In the light of the discussion above I am formulating my first hypothesis as follows:

Hypothesis 1: Experiencing certain emotions during the war may lead to the change in attitudes towards gender norms.

Hypothesis 1.a : Experiencing anxiety, caused by war, may lead to the change in attitudes towards gender norms to more progressive.

In this case the causal mechanism would look like: War (threat) -> experiencing of anxiety -> high level of uncertainty -> higher critical thinking -> shift in attitudes towards gender worms.

The relationship between the variables would look like: +DV <- +IV(1). The more anxiety people are experiencing because of the threat, the more liberal attitudes they would have.

As the effect is opposite for anxiety and anger I will consider effect of anger too:

Hypothesis 1.b : Experiencing anger, caused by war, may lead to the conservation of attitudes towards gender norms.

In that case the causal mechanism would look like: War (threat) -> experiencing of anger -> certainty and desire to act -> lower critical thinking -> conservation of attitudes towards gender norms.

In the case of the prove for this hypothesis we will see more conservative attitudes towards gender norms.

My second hypothesis will be connected to gender representation and its effect on the change of attitudes. At this point I want to draw attention to the descriptive representation. I think that it can work in two different but both impactful ways. First, it can serve as the encouraging stimuli - women on certain positions may be a role models and be the inspiration for other women to hold this type of positions. Second, it can be the instrument to fight gender bias - seeing women on a certain positions people may get used to it and do not have any stereotypes connected to

the connection between gender and occupation.

John Högström (Högström 2016) in his study revealed that overtime gender quotas in parliaments become more effective for descriptive representation. Aldrich and Daniel (2020) found an effect of gender quotas on the encouraging of diverse range of women in terms of personal, political and professional experiences Revillard and Tuffy (2022). Allen and Cutts (Allen and Cutts 2018) in their study revealed that gender quotas have the ability to change the overall perception of women politicians in a good way. In the research (Burnet 2011) we may see the evidences that gender quotas may lead to the less stereotypical perception of women in general and bring more respect towards females. Clayton (Clayton 2018) suggests that quotas is not the only political instrument, but their effect may have spill over on others spheres and fight gender bias in general.

The research on the effects of quotas may give us some important insights about representation of women on specific roles. I want to use the same logic, leaving quota topic aside. Specifically, I want to draw attention to the military sphere during the war and the possibility of women to take part in the armed forces. My theoretical expectation is that if it is more or less common for women to hold combat positions in the army or just in the armed forces in general, it can lead to higher representation of women on the position that inherently has very masculine character and is perceived as male profession. Hence, first, it may lead to encouraging of women to join army more, and second, it may have an effect of diminishing of gender bias in general.

Army is extremely masculine sphere and it is stereotypically perceived as only-male field (except medical and other care positions). But the state of war may require the exploitation of all possible resources and when women constitute half of the population it may be crucial. This case, if women start joining the army and occupy the most masculine sphere, it can lead not only to the notion that women as soldiers is a new norm, but also in general to make the gender bias weaker.

I formulate my second hypothesis as followed.

Hypothesis 2. The higher representation of women in the military may lead to the change of attitudes towards gender norms into more progressive.

The causal mechanism at this case would look like:

The relationship between the variables would look like: +DV <- +IV(2). The more women join army the more progressive attitudes towards gender norms society will have.

In this case the causal mechanism would look like this: War (threat) -> more women join army -> higher representation of women in male dominant sphere -> shift in attitudes towards gender norms in the society.

4 Research design

The research design of the study will be divided into two parts: analysis of the posts in Telegram, that has more descriptive function and the survey-experiment, which is conducted with the aim to claim some causal inference. Analysis of Telegram posts is needed to have a grasp of the situation based on the data from social media, to have an image of possible change. The survey-experiment provides the means for hypothesis testing.

4.1 Analysis of Telegram posts: war and social change.

The puzzle that interests me for this part of my study is whether such devastating event as war may have such consequence as a social change, particularly the shift in attitudes towards gender norms in the society to more progressive perspective. From the literature review and preliminary observation I have the expectation that in specific case of the Russian war in Ukraine there can be a social change connected to the perception of gender norms. Additionally, I expect the possibility to see the growing number of more liberal attitudes when the time passes, meaning the more time after the beginning of the war -> more liberal attitudes).

I decided to analyse the posts from the most popular Ukrainian channels in Telegram, which is the most popular social media right now in the country. Telegram is an important source of any political actions in the region right now. The brightest examples are mobilization of protestants in Belarus in 2020- 2021, the community initiative for people avoiding mobilization in Russia right now and local chats of the neighborhoods in Ukraine.

To analyse them I chose to execute sentiment analysis of each post in comparison with emoji that were left as reactions to this post. This method was chosen for several reasons. First, I rejected the idea to analyse comments to the posts for following reasons: all big channels have the function of commenting off, those channels who have them on are mainly bloggers who most of the time have quite strict political positions (therefore have specific type of followers). Second, currently comments are widely occupied by many bots. The issue here was to avoid analysing only the sentiments expressed by the moderators of the channels in posts. That is why I decided to use the emoji as a source of attitudes expressed by general public (followers).

My aim was to get all the posts that were published in the most popular Telegram channels

16

since one year before the Russian invasion (23.02.2021) and a bit longer than one year after (01.04.2023). To accomplish it I executed the method of web-scraping using Selenium though Python.

Overall, the aim of this part of the study is to measure any social change towards gender norms that can possibly be seen in people's attitudes expressed in Telegram. I have two units of analysis: Telegram post in the Telegram channel and emoji reactions that were left under this post by the followers.

4.2   Survey experiment.

This research project was designed as a survey-experiment. This method was chosen because it lets me to consider several factors for validity of the study. Survey-experiment allows me to systematically manipulate the variables and measure respondent's attitudes, providing valuable insights into the causal relationship between war and change in attitudes towards gender norms. Randomization and experimental design enhances internal validity of the study, whereas diverse sampling and contextual relevance may be beneficial for external validity. Moreover, survey component makes this research to be feasible and even possible in the current setting, because the state of war makes it very difficult to study current affairs.

I have chosen to conduct my research in Ukraine. First, there is an ongoing war in the country that disrupted societal structures and norms, we have an opportunity to observe how individuals and communities adapt and responds to these changes. It gives us a possibility to shed light on the impact of armed conflict on gender norms, that can be useful for further policies and social development in post-war period. Moreover, in my opinion, experience of Ukraine is crucial for understanding the social realities of the country itself and for the context of the region. Ukraine is the country from former Soviet Union block that undergoes drastic changes and rapid speed of democratization. The country has a unique political and social scene right now and I find it critically important to investigate social issues and specifically gender in this setting.

The survey experiment was created via online survey tool Qualtrics. The link for the survey was distributed via Facebook with specific target on people, who are currently living on the territories of Ukraine (official territories of the country on the moment before the beginning of

the war). The respondents could choose to fill the survey either in Ukrainian or in Russian. The data collection process took place from 15.05.2023 to 22.05.2023. In the title page of the survey apart from information about the research there was a trigger warning, explaining that there will be some questions about the ongoing war and asking those who do not feel ready to recall and share their experience to obtain from the filling it. First, respondents answered to demographic questions, second, they got the treatment and third, explicit and implicit attitudes were measured.

The exact effect of war and proposed causal mechanism of change in the attitudes towards gender norms was empirically tested by five treatments. Overall, survey-experiment consisted of six groups, including five treatment groups and one control group. Treatments had various forms, that will be discussed more carefully in dedicated part.

4.2.1 Dependent variable.

In this study, the dependent variable under scrutiny is the attitudes towards gender norms, with a particular focus on the potential changes being considered. One of the challenges of the survey-experiments is self-reported information. Even though it still gives us insights about the average mood in the society on the issue in question, it may not depict the actual believes of people.

That is why I designed two dependent variables: explicit attitudes towards gender norms and implicit attitudes towards gender norms. Both of them were measured after the treatment. Explicit attitudes were measured by two groups of questions: general questions about gender equality and set of specific questions from the method of (Long, Dawe, and Suhay 2022). Implicit attitudes were measured by the adopted to this specific research Implicit Relation Association Procedure (IRAP).

For the measurement of explicit prejudice I have chosen the method presented in the research presented by Long et al. (2022). Scholars created the system of questions to measure three different types of sexism: hostile sexism, modern sexism and belief in traditional gender roles. Hostile sexism corresponds with the general notion that women are inferior to men. Modern sexism is rather about the idea that with current institutional structure and legal system women

are not disadvantaged anymore, and even if there was discrimination in the past it doesn't exist anymore. Belief in traditional gender roles depicts that women and men are essentially created for different spheres and roles in the society and hence, there are naturally some activities that women are better in and men are.

There were nine questions that were presented in the type of statement, with which respondents should have agreed or disagreed. The level of their agreement was measured on a scale from 0 to 10, where 0 is "totally disagree" and 10 is "totally agree". In addition to this set of question three more general questions about gender equality were asked: first one was focused on the importance of the topic of discrimination from the respondent, second was dedicated to the opinion of the necessity of equal pay for women and men and third one was about the possibility of government to intervene in case of domestic violence. All three questions were also measured on a scale from 0 to 10.

For the measurement of implicit attitudes the Implicit Relation Association Procedure was chosen. The idea was to measure the attitudes or prejudice that people have, but probably are not ready to express. The better option for the topic would be Implicit Association Test, but it was not possible to conduct technically, as it is usually recreated in laboratory conditions and its transfer to online platform could be too costly, which is different for the chosen method (IRAP).

The practical application and procedure of IRAP was discussed in details in the paper of Barnes-Holmes et al. (Barnes-Holmes et al. 2010), which I used as a guide in my design. The IRAP consists of 6 blocks of questions with four types of trials in them.

Respondents were presented instructions, stimuli and replied to the stimuli. The participant was asked to state whether the couple (stimuli - target) was connected correctly or incorrect. Respondents were informed that in some parts of the procedure they will be required to respond not necessarily according to their belief, but rather according to the rules in each block.

The procedure had eight stimulus and twelve target concepts. In the group of stimulus there were words that had a direct meaning connected to either woman or man. For women they were: she, her , woman, Mrs; for men they were: he, man, his, Mr. As a target concepts, there were words signifying some qualities that are stereotypically being assigned to either men or women. For women they were: beauty, emotional, weakness, obedience, family and care; for

19

men they were: bravery, success, career, leadership, intellect and reliability. These are the closest translations to the original words in Ukrainian and Russian. Table 2 displays all stimulus and targets.

Table 2: Stimuli and targets for Implicit Relation Association procedure.

Stimuli Female	Stimuli Male	Target Female	Target Male
She	He	Beauty	Bravery
Her	His	Emotional	Success
Woman	Man	Weakness	Career
Mrs.	Mr.	Obedience	Leadership
		Family	Intellect
		Care	Reliability

These stimulus and targets constituted four different types of trials:

1) Stimili male - Target male (He - Bravery)

2) Stimuli male - Target female (He - Beauty)

3) Stimuli female - Target female (She - Beauty)

4) Stimuli female - Target male (She - Bravery)

At this point types 1 and 3 presented rather conservative attitudes towards gender norms, while types 2 and 4 presented rather progressive ones.

Respondents were presented six blocks, which had different rules of behavior. The instruction was presented before each block. Blocks 1, 3 and 5 were following conservative viewpoint: participants were shown the one trial at once, which was randomly assigned to be one of 4 types of trials. The respondent should have replied that the couple was connected correct if it was trial of type 1(Stimuli male and target male) and 3 (Stimuli female and target female), and incorrect if it was trial of type 2 (Stimuli male - Target female) and type 4 (Stimuli female - Target male). Blocks 2, 4 and 6 were following progressive viewpoint: respondents should have choose "correct" for 2 and 4 types of trials, and "incorrect" for types 1 and 3.

The instructions with new rules were shown to the participants before each block of trials. Each block had 24 trials, presenting randomly coupled words of each type. Respondents were

asked to reply as fast as it is possible and as correct as it is possible. In case of the wrong response (the one that was wrong according to the rules) the red "X" was displaced at the screen saying that the answer is wrong. In case of missing an answer the message was displaced to force a reply. First two block were test blocks, to ensure the respondents understood the rules and got used to the setting. Four other blocks were the procedure itself, the results of which were analysed later.

The IRAP designed in the way to measure the time needed for respondent to process the couple of stimuli and target and to asses whether this is right or wrong. The latencies of the responces are crucial for this analysis. The challenging part is that the need for speed makes the activity difficult, because the own attitudes can be mixed with the rules of the block. The main unit of analysis in this procedure is the time respondent spent for the correct responds: millisecond from the moment the question was displayed to the moment the correct response was pressed. The results of the IRAP will be analysed by statistical manipulation with standard deviations and means of the latency of each response. In the end of analysisof the results of IRAP I will have index of implicit attitudes for each respondent.

4.2.2 Independent variables.

I have five independent variables in this research. They are guided by two main hypothesis of this research: emotion and representation factors. Treatment groups 1, 2 and 3 are dedicated to emotional factors and treatment groups 4 and 5 received treatment connected to representation.

Emotion group of treatments consisted of four types of questions: treatment check question, the immersion to the specific emotion, certainty check, speed of judgement check. Each group from the representation treatment has got one question.

4.2.2.1 Treatment group 1: Experience of Anxiety.
In this research all treatment groups received a bit different types of treatment. Starting with first treatment group (T1), the focus of it was the emotion of anxiety. As it was discussed above there anxiety and anger are major emotions experienced by people during the war, but they are leading to totally different outcomes in terms of attitudes towards gender norms. The idea of the first treatment was to check whether recalling of specific events during the war which cause anxiety could lead to the shifts in the

21

attitudes towards gender norms. (footnote: all respondents were informed about possibility of sensitive questions concerning the war and asked to refrain from the filling of the survey).

The block of this treatment had 10 questions overall. Two questions were to measure the level of anxiety experienced at the moment of replying: first question was asked in the beginning of the block and the second question was asked in the end of the block.The questions were formulated in the following way: "Please, evaluate your level of anxiety right now.", with the range of answers from 0 ("absolutely clam") to 10 ("extremely anxious").

One question was asking to imagine the desired future in one year and how it will look like. The follow up question asked respondents to asses how difficult for them it was to imagine it. Four questions were dedicated to the feelings and emotions that people experienced from the war. One question was asking about level of felt general certainty in everyday life.

The block of questions was finalized by the question to measure the critical thinking and speed of judgement. Typical question for measuring it was introduced:

"Imagine that we are looking at a lake in which there are many water lilies. Every day the number of water lilies doubles. After 20 days, there are so many water lilies that the entire lake is covered with them. After how many days was only half of the lake covered?"

The idea of this question was to check, whether we will see any difference in the speed of judgement comparing T1 (anxiety) and T2(anger). It is part of the treatment check, to see whether theoretical expectation about difference in anxiety and anger are proved. This expectation would be that the anxiety group (T1) would show the higher levels of uncertainty and will approach the questions more carefully, and anger group will oppositely more oftem jusm to the conclusions with less thinking and have higher levels of certainty.

4.2.2.2 Treatment group 2: Experience of Anger.

Second treatment group was dedicated to the experience of anger. The idea was to check, whether thinking about the war and its specific parts that can lead to anger will make people have different gender attitudes than control group.

This block consisted of 11 questions. There were two questions for treatment check, measuring the level of anger at the moment. The questions were formulated as "State please how angry do you feel right now?". The same question was repeated in the beginning and in the end of the treatment block.

One question was asking to recall something specific from the Russian war in Ukraine that make respondents the most angry. It was followed by three couples of questions, designed in the following way. First question was asking to evaluate how much respondents agreed with the statement, where statement was provocative in terms of its content. Second question was about the level of certainty in the responds to the previous question. The idea was to present people with some statements that can be evaluated as unjust and illegitimate (e.g. "Some people believe that Putin will never go to court. Do you think it's possible?") and check their certainty about their judgement.

The next question was designed in the way to address the anger directly to the target. The question asked how much respondents liked certain people: Vladimir Putin, Vladimir Solovyev, Dmitriy Medvedev and Margarita Simonyan. These are one of the most famous figures of russian propaganda who are widely discussed in social media.

The last question in the block was created to measure the critical thinking and speed of judgement., it was the same question about water lilies from the T1 group, serving the same purpose to catch the indicators of fast judgement.

4.2.2.3 Treatment group 3: Experience of both Anxiety and anger. As people may experience several emotions the same time, even though one of them can be prevalent, I decided to create additional treatment group that will have both anxiety and anger treatment together. It was done to compare whether we can see any difference in the effect in anxiety and anger group separately and together, so to check interaction effect of the variables. To conduct it, all the questions from T1 and T2 were combined together into one separate treatment (T3).

4.2.2.4 Treatment groups 4 and 5: Representation treatment. The idea of this group of treatment was based on the notion that the more prevalent people think women are soldiers, the more progressive attitudes towards gender norms in general they will have. To check that, I decided to manipulate the experiment and to create two different treatments.

The idea bahind this treatment is the concept of "availibilty heuristic", presented by A. Tvercky and D. Kahneman (Tversky and Kahneman 1974). The authors explain it as the mental shortcut when people assess the frequencies of the class or probability of the event according to

their personal experience, how easy they can remember that something in question was happening to people they know. According to authors, instances of large classes most of the time are remembered better and faster than ones of less frequent class or events (Tversky and Kahneman 1974).

In the design of this treatment group I based on two theoretical assumptions: first, the higher representation of women on a certain position may fight general gender bias (in analogy with quota notion of Clayton Clayton (2018)); second, easy recalling will lead to the impression that the event is prevalent and in opposite more difficult recollection will lead to the impression of less prevalent event (Tversky and Kahneman 1974).

In the light of this two assumptions the same questions were created. Respondents were asked to recall stories about the heroism of women in the armed forces of Ukraine and describe them. The difference was the number of stories that we asked to be recalled: treatment group 4 was asked to recall only one story and treatment group 5 was asked to recall three different stories. The idea was that it will be easier for T4 to recall one story and hence, the respondents will have an impression that women soldiers in the armed forces is quite prevalent situation. And the result would be opposite for T5 as it would be more difficult to recall three stories and describe them. According to my expectation, T4 should show bigger effect on the attitudes towards gender norms than T5, because respondents from T4 would have impression that representation of women in the army is quite high.

4.2.3 Data collection.

4.2.3.1 Telegram web-scraping.
In the choice of the channels for my project I was directed by three criteria: top most followed channels, popularity of the channels before the war (number of views) and emoji function on each post. The channels chosen with more specific information about them can be found in Appendix B. Channels have posts both in Ukrainian and Russian languages.

I have used Selenium in Python to scrape all the channels I needed. The code for this can me found in the supporting material to this research. The program imitated the usage of the social media by a human, but with two main differences: much faster and saving the posts into dataset.

I have collected several units of information for the analysis of each post: date, text itself, the supplementary files (photos, videos, etc.), which emoji reactions were left under the posts and how many of each of them.

The program was scraping all posts that were present in the channels and in the end I ended up having 247.424 posts scraped. The number of posts scraped in each channel is: Truha channel – 44556 posts; Unian channel – 56215 posts; TCH channel – 71130 posts; Ukraine online channel – 34655 posts ; Real War channel – 40868 posts.

The data was pre-processed for the work with languages in question. For lemmatization I used UDPipe language model for both Ukrainian and Russian. I annotated the thematic dictionary and created new one with lemmas of the original words (all words should be in its first grammatical form). I also extracted stop words and converted others to lowercase.

The next step was subsetting of this big data set to leave only those posts that are related to this project - all posts that are connected to gender topic. I used dictionary methods of text mining to execute this subsetting. After very superficial manual check of the data and receiving the impression how the target posts could look like, I created two dictionaries: in Russian and Ukrainian. They are almost identical in terms of words they contain, with some minor differences.

These dictionaries contained the most popular female names both in Ukraine and Russia, female forms of words for occupations, metaphors, and allegories for women ("weak sex", "better part", "beautiful part"), adjectives that are used mainly talking about women and in its female form of word, swear and intimidating words that only women are addressed with. Apart from neutral words, the dictionaries had the groups of words that can be considered as explicitly sexist or feminist. If the scraped posts contained the words from these dictionaries, they were left to constitute the final dataset for the analysis on gender topics. It had 3882 posts in total.

4.2.3.2 Survey-experiment distribution.

The survey-experiment was designed in online survey building tool Qualtrics. This tool was choosen, because its functionality if very wide, but the same time it is very user friendly. Moreover, with Qualtrics it was possible not only to reproduce experimental setting with proper randomization, but even to replicate the Implicit Relation Assosiation procedure, which is usually build in a separate app. First, the survey was imported

in English and then translated to Russian and Ukrainian. Russian translation was performed by me and translation to Ukrainian was made by a native Ukrainian speaker.

The distribution of the survey was held through Facebook ad manager. It helped me to reach the target audience in quite a short time. I have created separate page that was called "Social survey 2023" (in Ukrainian) and put all information about the survey-experiment there : it is done for master's student thesis, shortly the topic of the survey, information about incentives and the link. There was also picture for advertisement that I created in Canva. In public space my survey-experiment was called just survey not to reveal the procedure. The topic was presented also in a broader terms as "survey about social change in Ukraine", without specification about gender norms.

After the page was designed well, I created an ad for distribution of the survey via this page. I managed the targeting according to place where people currently live right now (Ukraine) and age (18 - 65 +). The add was complemented by the suggestion to participate in the lottery. Lottery worked in the following way: only respondents who completed the survey till the end were participating in the lottery and had a chance to win a prize. There were three prices: first winner received 100 euro and second and third received 50 euro each.

Each respondent had slightly different number of questions in the survey, caused by the different treatments. To simplify, we may say that survey had two different parts - survey itself and Implicit Relational Assossiation Procedure (IRAP). Block of IRAP was the same for all the respondents, containing 6 blocks with 24 trials each (1 trial equals to one question in Qualtrics). Overall, it is 144 questions, but as the specific of this block is speed, on the average it took participants to complete it in 5-7 minutes.

All the types of surveys for treatment and control groups had the same structure: title page with the consent for filling the survey, demographic questions, treatment (if not control groups), explicit attitudes questions, IRAP, request for e-mail if the respondent wanted to participate in the lottery, gratitude for the participation. Overall,control group had 29 questions + IRAP, T1 (anxiety) - 40 questions + IRAP, T2 (anger) - 41 questions IRAP, T3 - 50 questions + IRAP, T4 and T5 had 30 questions + IRAP both. All of the surveys were filled by respondents in 20-30 minutes.

The survey was published on 15th of May and was rolling until 21st of May. It was being distributed only in Facebook and messanger. Roughly 1200 responses were collected during this time and the Facebook ad was terminated. But later, until 24th of May for the reason of survey being still online more responses were gained. The final data set contained 3146 responses.

During the campaign, two people followed the page of the survey, 426 reactions and 234 comments were left under the post with ad. There were three reactions left under the post: like, angry smile and laughing smile. All the comments can be divided to four main categories according to its content: accusation of fraud (because of the lottery), opposition to the accusation and supporting the survey, wishes to Ukraine to win the war, random comments from bots. All comments were predominantly in Ukrainian. 30 people shared the post to their personal pages or the groups. The main challenge with distribution could be the accusation in financial fraud, but as people started to defend the survey it did not interfere with the results of the data collection.

5 Data description

5.1 Telegram.

The final data for Telegram analysis contained some additional variables that were not in the dataset initially: the indexes of the sentiment analysis results and the emoji reactions indexes for each post. Below is the description of how they were calculated during data preparation phase.

Another set of two dictionaries in both languages was created for sentiment analysis. It partly uses words from the first pair of dictionaries. From the additional parts, it has names of professions but with a corresponding feminist form, more extensive vocabulary of sexist swearing words, sex-oriented diminutives etc. All these words were evaluated with scores ranging from -2 to 2, where -2 is very progressive attitude (usage of the word "abuse" or "harassment") and 2 is very conservative ("slut", "cook").

For the emoji sentiment, the analysis steps were to divide all the emojis that could evaluate the posts positively or negatively and count the final score of the emoji reaction to each post. The idea is to see how the main sentiment of the post is connected to its reactions, whether it is controversial or not. From all emojis that were present as reactions I had to ignore two – "thinking face" for its lack of informative evaluation and "dove" for its distorted meaning in the context of war and manipulation of this symbol by pro-war activists.

The results are stored in a csv table. The data had 38 variables: channel name, date of post publication, number of views, text of the post and all other variables are each for separate emoji. Each variable of emoji contains information on the number of this emojis left under each post. After pre-processing two more variables were added to the initial dataset – values of sentiment analysis and emoji count.

5.2 Survey-experiment.

Although the total number of responses was quite high by the end of data collection, after the data cleaning and removing incomplete records the total number of valid responses reached 998 observations.

From this sample, in terms of age the biggest group was people of 55-64 years old (34%). It

was followed by the group of 45-54 (23.4%), then 65+ (21.5%). The fewest amount of respondent were in the age group of 18-24 (less than 1%), followed by the group of 25-34 (6.4%) and 35-44 (13.8%). This distribution can be explained by prevalence of elder people in Facebook, while younger ones are more present in other social media.

669 (67%) respondents identified themselves as women, 321 (32%) indicated their sex as man and 8 (0,8%) people reported to be non-binary. 39.3% of respondents reported to be pensioners, 27.5% were working full-time over past year and 13% reported to be unemployed. In terms of education, the biggest group had their master's degree as their highest level of education (36%), after it there was a group with the vocational training as highest level of education (30%).

Only 39 people from 998 responded the survey reported that they served in the military since the beginning of the war. Majority of the respondents reported that they are somewhat more interested in politics rather than not. The following table provides summary statistics for numeric variables:

```
Summary statistics of numeric variables
======================================================================
Statistic                         N    Mean   St. Dev.   Min    Max
----------------------------------------------------------------------
Interest in politics              999  6.777   2.411      0      10
Anxiety before treatment(T1)      186  7.247   2.172      1      10
Level of certainty (T1)           186  4.715   2.528      0      10
Anxiety after treatment (T1)      186  6.839   2.284      1      10
Anger before treatment (T2)       152  7.507   2.637      0      10
Level of certainty 1 (T2)         152  8.263   2.228      1      10
Level of certainty 2(T2)          152  7.855   3.146      0      10
Level of certainty 3(T2)          152  8.145   3.490      0      10
Anger after treatment (T2)        152  7.599   2.760      0      10
Anxiety before treatment(T3)      152  7.171   2.134      1      10
Level of certainty (Anxiety T3)   152  4.901   2.874      0      10
Anxiety after treatment (T3)      152  6.178   2.501      0      10
Anger before treatment (T3)       152  6.171   3.130      0      10
Level of certainty 1 (T3)         152  7.941   2.420      0      10
Level of certainty 1 (T3).1       152  7.428   3.438      0      10
Level of certainty 1 (T3).2       152  0.737   2.096      0      10
Anger after treatment (T3)        152  6.664   3.143      0      10
Explicit index                    999  7.537   0.740    4.750   9.500
Implicit index                    999  -0.178  0.281   -2.259   0.522
----------------------------------------------------------------------
```

Table 3 provides summary statistics for categorical variables:

Table 3: Summary statistics of categorical variables

Variable	T1 (%)	T2 (%)	T3 (%)	T4 (%)	T5 (%)	C (%)
Age						
18-24	1.6	0.7	0.7	0.6	3.6	6.8
25-34	7	4.6	9.9	6.1	10.9	12
35-44	12.9	15.1	14.5	17.2	27	27.1
45-54	27.4	21.7	13.8	22.2	34.3	35.4
55-64	37.6	31.6	37.5	28.9	24.1	18.8
65+	13.4	26.3	23.7	25		
Sex						
Female	71.5	59.9	67.8	69.4	67.9	64.6
Male	27.4	38.8	32.2	30	31.4	33.9
Nonbinary	1.1	0.7		0.6	0.7	1.6
Other		0.7				
Employment status						
Full time	29.6	27.6	24.3	25	27.7	30.2
Part time	5.9	3.3	5.9	6.1	3.6	5.2
Unemployed	15.1	12.5	15.1	13.9	10.9	10.9
Housemaker	8.6	5.9	8.6	8.3	10.9	8.9
Student	0.5	43.4	42.1	0.6	39.4	38
Pensioner	32.8	7.2	3.9	41.7	7.3	6.8
Other	7.5			4.4		
Education						
Elementary school	1.1	0.7	0.7	12.8	0.7	1.6
Middle school	15.6	9.9	13.2	28.3	13.1	13
Vocational training	29	34.9	26.3	8.3	32.8	30.2
Incomplete higher education	10.2	6.6	10.5	9.4	6.6	9.4
Bachelors	9.1	11.2	8.6	37.8	4.4	7.8
Masters	32.8	35.5	37.5	3.3	38	34.9
PhD	2.2	1.3	3.3		4.4	3.1
FALSE						

In the Figure 1 you can see the distribution of responses in the survey according to the place where respondents were at the moment of the beginning of the war.

5.2.1 Balance check.

Survey-experiment designs involves the causal relationship claim, for which the proper randomization is crucial. Even though properly random distribution of the survey was ensured, it is still required to conduct a balance check for all groups. 192 respondents are present in

Figure 1: Distribution of responses

the control group, 186 respondents in T1, 152 respondents in T2, 152 respondents in T3, 180 respondents in T4 and 137 respondents in T5.

Balance check was conducted through t-tests for each treatment group in combination with the control group. P-values of each test's output suggest statistical significance of differences between groups. The value of 0.05 is taken as a threshold: if the p-value is lower than that, the difference is considered statistically significant and the groups are disbalanced; otherwise the difference between groups is statistically insignificant and we may consider groups to be balanced. The t-test was conducted for all demographic variables: age, gender, employment status, highest level of education, geography. Figures 2-4 display the results.

Overall, we may conclude that the groups are balanced. All groups except one overcome the p-value threshold of 0.05. Only geographical factor in the combination of T2 and control group showed slight imbalance. I will consider this factor and control for this covariate in the main analysis, to ensure that respondents' place of residence will not distort results of the experiment. Apart from that, randomization can be considered successful and groups balanced and suitable for the analysis as results of experiment.
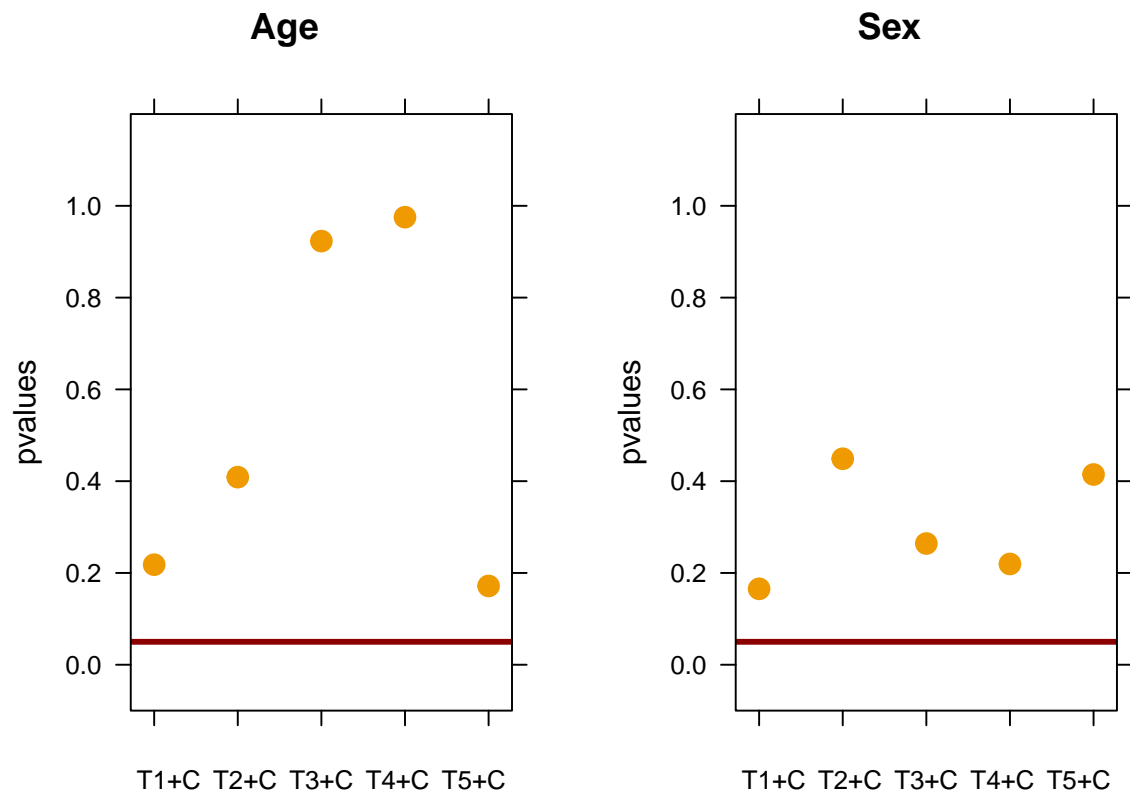
Figure 2: T-test for balance check(age and sex)
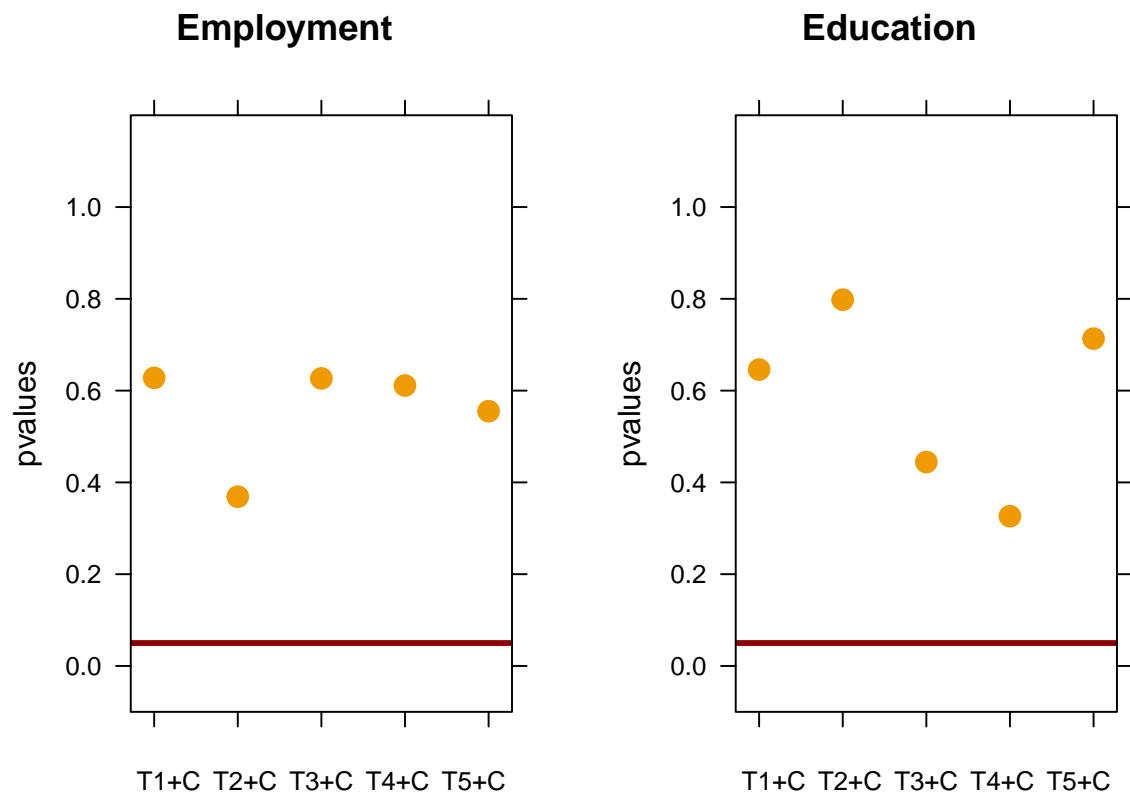
Figure 3: T-test for balance check (employment and education)
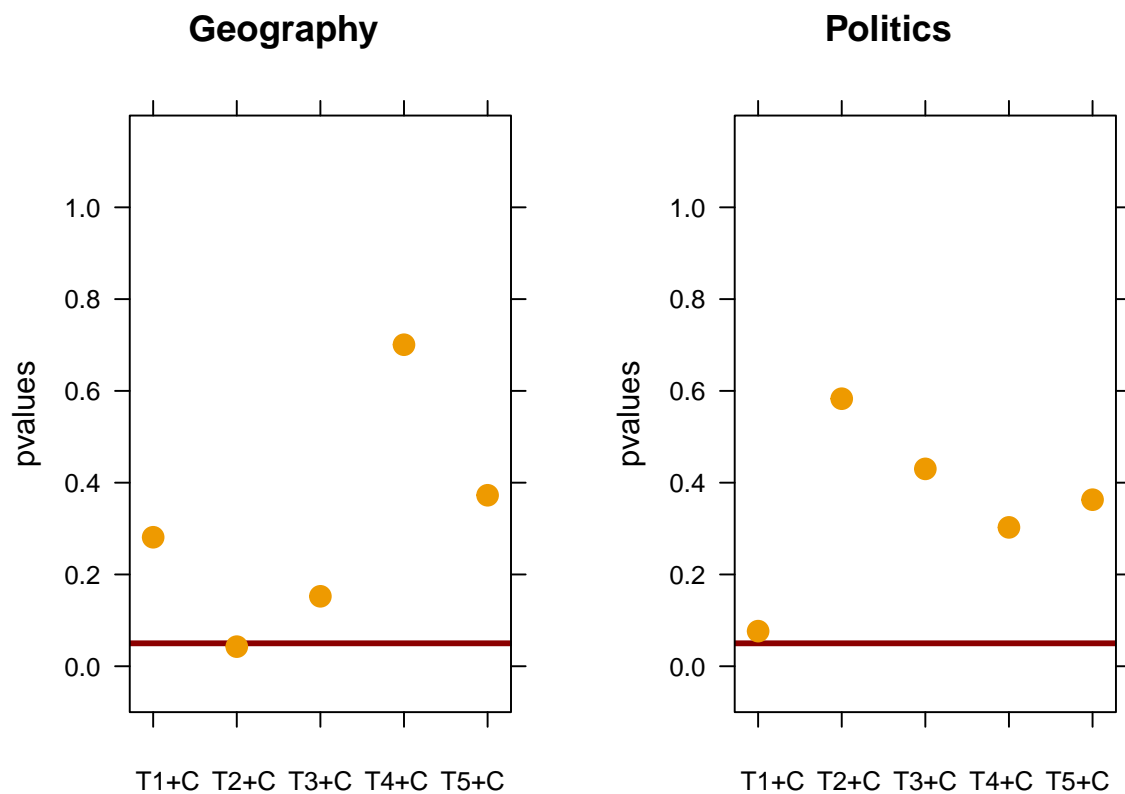
Figure 4: T-test for balance check(geography and interest in politics

5.2.2 Manipulation check.

The survey-experiment considered the necessity to conduct a manipulation check. For treatment groups 1-3 questions to measure this were provided in order to ensure that groups received a treatment and assess the size of its effect. Treatment groups one and two were asked how much anxiety and anger, respectively, they experienced before the treatment and after. Treatment group 3 had the same measurements, but for both emotions.

Figure 5 visualizes how the distribution of the treatment worked for all treatment groups for the emotions hypothesis:

Treatment effects are checked through analyzing means and standard deviations in each group. With mean we can understand the average size of the received treatment by all respondents, and with standard deviation we may consider the variance of the replies. Table 4 provides this values.

The variance of replies is higher in treatment group three, where participants received both

Treatment distribution (anxiety)

Anxiety treatment distribution

Treatment distribution (anger)

Anger treatment distribution

Treatment distribution (anxiety in mixed group)

Anxiety in mixed treatment distribution

Treatment distribution (anger in mixed g

Anger in mixed treatment distribution
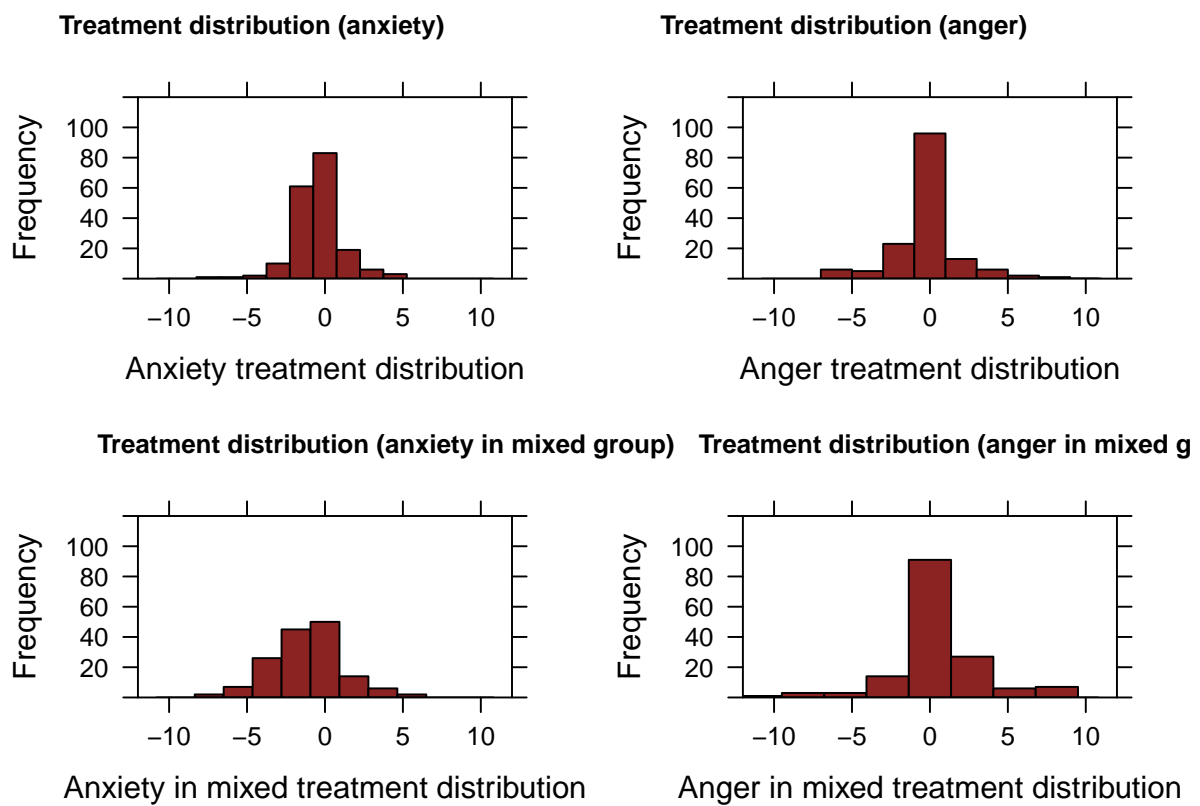
Figure 5: Distribution of the treatment

Table 4: Treatment check

Groups	Mean	SD
T1	-0.41	1.57
T2	0.09	2.07
T3_anxiety	-0.99	2.14
T3_anger	0.49	2.93

treatments (anxiety and anger) at the same time. In general, the variance is smaller for anxiety than for anger. It means that the dispersion in anger is higher than in anxiety, hence, there is higher degree of consistency among the participants in terms of anxiety. On the one hand, it may mean that the war equalizes the experience of anxiety for people, but on the other hand, it also could mean that the treatment did not work properly for the anxiety group as similar results might be suspicious.

In terms of means, we immediately can see that there is a difference in the treatment received for anger in anxiety both in individual manipulations and together. Anxiety manipulation check shows negative change (-0.41), which means that starting the treatment block of question the respondent on average felt more anxious than by the end of the block. We may see the same trend for the anxiety in the treatment group three, but the size of the manipulation effect is twice bigger (-0.99).

Anger manipulation has worked out as was expected based on the theoretical framework. Even though in individual trial the size of the effect of treatment is not very big (0.09), it is still positive, which means that people reported to be slightly angrier in the end of the block than in the beginning. The anger manipulation also appeared to be more successful in the mutual part (0.49).

Overall, the anger treatment appeared to be more successful than the anxiety treatment. Even though the effect does not seem to be very strong, we may still see some patterns. Based on theory, the reason for failure of the anxiety treatment is assumed to lie in the deep interconnection between anxiety and anger. It is possible that the treatment that was supposed to lead to rise of anxiety actually still led to rise of anger. It may come from the fact that in common part (treatment three) both effects become stronger (even though anxiety is negative) and the biggest positive effect is anger in the third treatment group. This treatment effect will be investigated further in the analysis chapter.

For the treatment groups four and five there was no possibility to provide the same treatment check. Since respondents were asked to recall one or three stories about women serving in Ukrainian defense forces, collected results are in text format. Hence, I manually checked all the texts written by the respondents and calculated how many of them actually "got the treatment",

35

meaning, recalled necessary number of stories and probably imagined women soldiers to be either more or less prevalent. The treatment is considered received if at least one story was briefly described.

In the treatment group four 33.33% of respondents did not get the treatment. People either could not recall the stories, or did not want to, or expressed the opinion that women should not be serving in the army. In the treatment group five 28% of respondent did not received a treatment for the same reasons. All those who considered as received treatment generally reported on the stories vastly covered in the media or about their relatives and friends.

5.2.3 Additional variables for the analysis.

5.2.3.1 Explicit attitudes. Several questions of explicit attitudes variable were reverse-coded. In some question values differed in terms of spectrum: even though all of them were measured from 0 to 10, as there were different ways of measurement, some of the had extreme conservative attitudes on the 10 point and some of them extreme feminist attitudes also on 10. Consequently, 6 questions from the explicit block of dependent variables were converted to the type: "0 - extreme conservative, 10 - extreme feminist".

After reverse coding, the explicit attitudes index was calculated for each respondent by the extracting means from all 12 question in the explicit attitudes block. The results were stored in the new variable called "explicit_index" and this variable will be one of two main dependent variables for the analysis.

5.2.3.2 Implicit attitudes. For the second part of dependent variable - implicit attitudes - I have also created indices for each respondent. To get this values I closely followed the processing of the results of Implicit Relation Association procedure that was described in detail in the paper of Barnes-Holms and Stewart (Barnes-Holmes et al. 2010) . Overall, the process had ten steps, from which first two were already conducted during data cleaning (excluding all incomplete and inappropriate data).

Other steps contained various calculations of time from the moment question appeared to the moment of correct answer across different types of trials and blocks. I had six blocks of questions in my procedure, first two of which were considered as test trials, to make people

understand the rules. That is why for the final calculation only blocks 3 to 6 were regarded.

I have calculated 8 standard deviations for the four types of the trials for the couples of blocks (3 and 4, 5 and 6); 16 means for each trial type in each block were calculated; 8 difference scores were calculated based on the means; 8 D-IRAP scores by dividing each difference score by corresponding standard deviation; 4 overall trial types D-scores; 2 D-IRAP scores specifically for conservative and feminist attitudes. All of these values are stored in the data set.

The final values were obtained by averaging all 8 D-IRAP scores. In the original IRAP procedure this value is called Overall relative D-IRAP, but for the sake of convenience the final results of these calculations will be stored in the variable called "implicit index". This variable is my second main dependent variable. For better understanding of the procedure of the IRAP's results calculation check Barnes-Holmes et al. (2010) .

5.2.3.3 Level of certainty.
The level of certainty is one of important factors for my analysis, so I had to create an index for it as well. According to the theory, certainty has its specific role in distinguishing between anxiety and anger. Because of the specifics of the treatment and based on theory the level of certainty was measured in slightly different ways in all three groups.

For measuring the certainty in the state of anxiety I used one question, whereas for the measurement of certainty in the state of anger three different questions were asked. To make the variables more convenient for analysis, I have decided to create the index for level of certainty in the anger group. As the scales had the same specter logic, I have calculated the mean across all three variables for each respondent. In the end I have got the index of certainty level in state of anger for both T2 and T3, which is the average level of certainty calculated from three questions.

6 Analysis

6.1 Sentiment analysis of Telegram posts.

I will start by discussing visualization of the results of sentiment analysis conducted on the data from Telegram. Even though it is a descriptive method and does not imply causal explanation, we still may see specific trends.

First, let us look at the general graph that contains information on the sentiment and emoji analysis (Figure 6). The value of post's sentiment varies from -10 to 10, where negative values represent feminist attitudes and positive values represent conservative views. The color of the circle is defined by the positive index (blue) of emoji and negative one (red). If the circle is blue, the post has more positive reaction over negative, and vice versa if it is red. The size of the circles is defined by the size of emoji index: the higher is absolute value - the bigger the circle. The vertical red line signifies the beginning of the war.

Figure 6: Sentiment and emoji indices of the Telegram posts

As we may see, emoji reactions were less popular among the channel's followers before the war started. Moreover, the reactions before 22.04.2022 were predominantly positive. After the war we see the outbreak of the reactions. We may see many negative reactions right after the

threshold; their density decreases over time.

It is important to note that if the post has a positive value (conservative attitude) then a negative reaction would be in opposition to this sentiment; hence, it is possible to assume that red circles above zero and blue circles below zero roughly express more progressive attitudes. Blue circles above zero and red circles below zero are oppositely more conservative.

Overall, we may see that from the standpoint of gender, as all posts were selected based on their relation to gender topics, there is a dramatic change between the followers' activity after war start. The beginning of the war triggered a burst of negative sentiment, which at some point can be explained by the specificity of explicit language in both Ukrainian and Russian. The majority of swearing words have female form and are also considered sexist, even when not applied to women.

To go deeply in the discussion of these parameters, two more graphs are presented below. The first one (Figure 7) depicts only values of sentiment analysis of the posts, with the average value for each month represented by the blue line. Before the beginning of the war the distribution of the posts with different sentiments was more or less equal, but the trend changes approaching the beginning of the war. The more conservative sentiment was building up since the end of 2021. It could be explained by the societal preparation for the war and beginning changes, as there are studies which capture the social change during the period of war preparation (Huddy, Feldman, and Cassese 2007).

However, since the war outbreak the average sentiment value gradually decreases, becoming more progressive over time. The first third of 2023 also is signified by growth in more conservative attitudes on average, but after some point the value started to crawl down again. We should remember that sentiment analysis was conducted on the data from the posts in Telegram channels, that are moderated by administrators. These results cannot be generalized to channels' readers, but rather just to the discourse of the channel's owners.

The next graph (Figure 8) depicts the emoji reaction function becoming extremely popular since the war outbreak. In contrast to sentiment analysis, there are no specific trends visible in the emoji results. Average values of the results are concentrated around zero, which may mean that the posts had more or less equal number of negative and positive reaction. There is just

39

Figure 7: Average sentiment index per month

a slight trend of emoji reaction being more negative during first half of 2022 and starting to be more positive towards the end of the year. Since the beginning of 2023 an increase of the average value is visible, emoji reactions become more positive.

Overall, this short visual analysis leads to two main conclusions. Firstly, the emoji reaction obviously became a popular function since the beginning of the war, and people started sharing their reactions more often. Secondly, even though no particular trends are clearly visible, there is definitely a change in the way administrators post content and people react to it. If we consider the fact that all posts presented in the graphs are gendered and were chosen only based on their connection to the gender topics, we may conclude that the war has triggered some changes in this regard. There are much more posts published touching upon gender related topics, and the feedback from people is much higher.

6.2 Hypothesis 1: emotions.

6.2.1 Level of certainty and fast judgement.

My first hypothesis was connected to investigation of effect of emotions experienced during the war by people on their explicit and implicit attitudes towards gender norms. Working with

40

Figure 8: Average emoji index per month

the theory, I have identified two factors that may be the outcomes of experiencing either anxiety or anger. These two factors are general level of certainty and speed of judgement. The theory suggests that experience of anxiety leads to lower general certainty and more careful slow judgment, whereas experience of anger leads to higher levels of general certainty and fast but less thought-through judgement.

To check the level of certainty in each group I have calculated the means of the corresponding variables. The results are presented in Table 5:

Table 5: Level of certainty in treatment groups

Treatment 1(anxiety)	4.715
Treatment 2 (anger)	8.088
Treatment 3(A+A)	7.156

The results from the survey-experiment satisfy our theoretical expectations. The lowest level of certainty is witnessed in treatment group one, where people were exposed to memories that could cause anxiety. The highest values of certainty is in the treatment group two, which had manipulation connected to anger: this value is almost two times bigger than the anxiety ones. Treatment group three, which had the mixed manipulation with both anger and anxiety (even

though the effect is less that in anger group), has still quite high level of certainty. It may lead to assumption that either anger treatment could be stronger than the anxiety one, or, in this specific case, people's experience of anger is stronger than anxiety.

Second factor was checked by identifying how many correct responses respondents from each group have to the corresponding question. The question was aimed to measure whether people take time and think about the issue or jump fast to the conclusion. For easier comparison we may look at Table 6.

Table 6: Fast judgement assessment.

Group	N correct answers	N respondents
Treatment 1(anxiety)	24	186
Treatment 2 (anger)	15	152
Treatment 3(A+A)	20	152

Here our theoretical expectation also appears to be proven. The highest number of correct answers is in treatment group one, which was supposed to be include careful and slow thinkers. The lowest number of correct answers is in the anger group; that can signify fast judgment. Treatment group three, similarly to the certainty example, has the amount of correct answers bigger than in treatment group two (anger), but smaller than treatment group one (anxiety).

Following these observations we may conclude that there are high chances that respondents in each group actually have received the treatments. There is a noticeable difference between groups for these two factors, which corresponds with the theory. Let us explore further whether the difference between treatments will also show any results in terms of causal relationships with attitudes towards gender norms.

6.2.2   Linear models.

To investigate the relationship between the both types of attitudes towards gender norms - explicit and implicit - I will conduct the linear regression analysis. First, I will check the relationship between explicit and implicit attitudes separately and the three emotions treatment groups. Second, I will control these models for covariates. Third, I will explore weather there is

a heterogeneous effects between treatment and some of the demographic factors. For the reason of convenience some of the fitted models were placed in the Appendix A.

For the beginning I have regressed the explicit attitudes index on the group of each treatment (Table 7).

Table 7: Linear regression model 1.

	Estimate	Std. Error	t value	Pr(>|t|)
Control group	7.553	0.05326	141.8	0
Treatment group 1 (explicit)	-0.01889	0.07592	-0.2488	0.8036
Treatment group 2 (explicit)	0.02885	0.08012	0.3601	0.7189
Treatment group 3 (explicit)	-0.03091	0.08012	-0.3858	0.6998

Analyzing the estimated coefficients, we may see that the effect is opposite to what we expected. The effect of treatment group one is negative, which means that the attitudes actually are less progressive in the anxiety group in comparison with control (intercept), same as the treatment group three, in which the effect is slightly higher. In anger treatment group the coefficients is positive, which may signify the increase in more feminist attitudes in this group. In general, the effect size is very small, but what is more important unfortunately for all of these coefficients statistical value is very low and is not significant. We cannot reject the null hypothesis.

Keeping in mind that the questions in the gender variable were very different and touched upon different spheres, I have fitted separate linear models for all questions in the dependent variable with explicit attitudes. In general, there is no dramatic difference, but two coefficients drew my attention. In the question "The society in Ukraine already reached the point, where women and men have equal opportunities" (which is supposed to be a modern sexism according to theoretical framework) we can see the effect of treatment group three (-0.63). Apparently, if the person received this treatment their views will be 0.63 points more conservative, than the control group. We also may see the effect of the treatment group two in the question "It is okay when a man decides to stay home to look after children and house instead of working". This question is classified as traditional gender norms in our classification. If the person received the anger treatment, they will more conservative (-0.64) than the control group. Both of these effects are statistically significant.

Even though we do not see statistically significant models in general, checking for the separate questions gave us some results. We may see that actually in terms of modern sexism and traditional gender roles (the forms that are not as explicit as hostile sexism) our treatment worked

and it did as we expected. The anger has pulled the attitudes towards gender norms towards more conservative and even mixed with anxiety we may still see this effect.

The expectation of the change in the attitudes because of war is higher for explicit than for implicit attitudes, because the latter ones are deeper in people's cognition and they need more time to noticeably change. Especially in the case when we are trying to do not the individual claims, but rather collective. We may still have a look at the results of linear regression for implicit attitudes (Table 8). We witness the same situation regressing the implicit attitudes index on the groups:

Table 8: Linear regression model 2.

	Estimate	Std. Error	t value	Pr(>|t|)
Control group	-0.1547	0.0207	-7.475	2.395e-13
Treatment group 1 (implicit)	-0.01526	0.0295	-0.5173	0.6051
Treatment group 2 (implicit)	0.008758	0.03114	0.2813	0.7786
Treatment group 3 (implicit)	-0.04777	0.03114	-1.534	0.1254

Interpreting implicit attitudes we should be careful because of the specificty of the D-IRAP score. The Implicit Relation Association procedure is analysed in the way that the higher positive score it has the more conservative attitudes and the bigger negative score it has the more feminist attitudes are. Hence, looking at linear model we should asses negative estimate coefficients as more feminist trend, and positive ones as more conservative.

In both treatment groups 1 and 3 the coefficients are negative, that can be interpreted as the effect that leads to more feminist views. Same as in the previous model the strongest estimate we have for the mixed group with both anxiety and anger. Unfortunately, this model also has very high p-value and consequently is not statistically significant. But the effect for treatment group three shows almost significant p-value, that can be the reason for the further exploration of this group.

To investigate the possible relationship further, I fitted the model for both explicit and implicit attitudes with controls. I controlled on all demographic factors data on which I have in the

data set. It is possible to find all additional models in the Appendix A.

Overall, from all the tables with controls we may see that there are some factors influencing the results. For example, interest in politics shows statistical significance influencing the explicit attitudes towards gender norms in more progressive way. In implicit attitudes we see that being male and non-binary may influence the attitudes towards more conservative. We also see negative effect on the attitudes from the factor of living in Odessa region when the war started.

With controlling more information about the behavior of the variables was gained, but we still do not see any effect of the treatments. The other way to investigate further the results is to check the heterogeneity of treatment effects. From the control analysis we have seen that there are several factors that may have the effect on attitudes, I examined the interaction between these effects and the treatment. The factors that I have examined: age, gender, geographical factor and education.

All the tables you may find in appendices. In the following tables you may see the interaction of the fitted model with geographical factor. We have significant positive results for the treatment group 3 (anxiety and anger together) and some of the regions.

If at the moment of the beginning of the war a person was in one of the regions - Cherkasy, Ternopil, Dnipropetrovsk, Kiev, Ivano-Frankivsk or Zakarpattia - and received a third treatment, they had significantly more progressive attitudes towards gender norms than the control group. We also may see negative effect for the interection between Khmelnytskyi region and treatment group 2 - oppositely to our expectations, in this case anxiety treatment vice verse lead to more conservative attitudes than the control group.

For the interaction in the implicit attitudes we may also see the heterogeneity effect for two factors: age and geography. Almost in all cases this effect will be influencing the attitudes towards gender norms in more conservative way, as the interpretation of the implicit model is reverse. If the person is aged from 35 years old and received the first treatment the attitudes will be more conservative. This trend is the same for the interaction between second and third treatment and several regions. The only exception is Zhytomyr region, where we actually can see the more progressive attitudes if the person received the third treatment.

As the interaction check has given us quite a few results in the connection with regions, I

decided to test the heterogeneity effect in a different way. As my hypothesis is based on the assumption that the emotions experienced from war may lead to the change, there is a reason for the different effect among the people who lived in different regions. There are some regions where the shelling and bombing was more intensive than in others, hence, probably such emotions as anxiety and anger could be experienced more often and deeper by people living there.

That is why I have created the dummy variable of geographical factor, which would signify whether the person lived in the regions that were uder the fire more than others or not. Regions Donetsk, Luhansk, Zaporizhia, Mykolaiv, Odessa, Sumy, Kharkiv and Kherson were supposed to be the most fired, others less. Kiev was not put in the first category for the reason the bigger safety of this region (there is still a model for the dummy variable with Kiev). You can see the results in Table 9.

Table 9: Linear regression model 3.

	Estimate	Std. Error	t value	Pr(>|t|)
Control group	7.362	0.5004	14.71	1.785e-42
Treatment group 1 (explicit)	0.09911	0.09301	1.066	0.287
Treatment group 2 (explicit)	0.1208	0.09382	1.287	0.1984
Treatment group 3 (explicit)	0.1966	0.09273	2.12	0.03437
Geography factor (proximity to war front)	0.3638	0.1312	2.773	0.005718
Age (25-34)	-0.6532	0.3476	-1.879	0.06069
Age (35-44)	-0.4802	0.3391	-1.416	0.1572
Age (45-54)	-0.3349	0.3364	-0.9955	0.3199
Age (55-64)	-0.4368	0.3342	-1.307	0.1917
Age (65+)	-0.5958	0.3367	-1.77	0.07726
Sex (Male)	-0.2407	0.06087	-3.953	8.553e-05
Sex (Own answer)	0.3703	0.2977	1.244	0.2141
Sex (Prefer not to say)	0.1268	0.7172	0.1768	0.8597
Employment status	0.01615	0.01404	1.15	0.2504
Education (high school)	-0.1747	0.2923	-0.5978	0.5502
Education (vocational training)	-0.1468	0.2883	-0.5092	0.6108
Education (incomplete higher)	-0.0971	0.2983	-0.3255	0.7449
Education (bachelors)	-0.1588	0.2989	-0.5314	0.5953
Education (masters/specialist)	-0.06522	0.289	-0.2257	0.8215
Education (PhD)	0.3818	0.3315	1.152	0.2499
Military service (no)	-0.03589	0.141	-0.2545	0.7992
Geography factor (Kyiv included)	-0.0852	0.0849	-1.004	0.316

	Estimate	Std. Error	t value	Pr(>|t|)
Interest in politics (1)	0.6663	0.3666	1.817	0.06964
Interest in politics (2)	0.5181	0.3374	1.536	0.1251
Interest in politics (3)	0.372	0.3044	1.222	0.2221
Interest in politics (4)	0.537	0.3138	1.711	0.08747
Interest in politics (5)	0.5448	0.2867	1.9	0.0579
Interest in politics (6)	0.7406	0.2938	2.521	0.01194
Interest in politics (7)	0.7483	0.2901	2.58	0.01011
Interest in politics (8)	0.7683	0.2906	2.644	0.008404
Interest in politics (9)	0.838	0.2958	2.833	0.00475
Interest in politics (10)	0.9301	0.289	3.218	0.001355
Interaction (T1 and geo dummy)	-0.3128	0.1556	-2.01	0.04481
Interaction (T2 and geo dummy)	-0.1897	0.1686	-1.125	0.261
Interaction (T3 and geo dummy)	-0.6845	0.1686	-4.061	5.487e-05

This interaction has given significant results both for explicit and implicit attitudes. For explicit attitudes we may see the negative effect of first and third treatment groups (-0.31 and -0.68 respectively) if the respondents were at the most fired regions at the beginning of the war. For the implicit attitudes we see the same effect but only for the third treatment – 0.20 which is supposed to be more conservative because of the reverse interpretation (Table 10).

Table 10: Linear regression model 4.

	Estimate	Std. Error	t value	Pr(>|t|)
Control group	-0.03312	0.2017	-0.1642	0.8696
Treatment group 1 (implicit)	-0.04679	0.03749	-1.248	0.2125
Treatment group 2 (implicit)	-0.01013	0.03782	-0.2678	0.7889
Treatment group 3 (implicit)	-0.1069	0.03738	-2.86	0.004367
Geography factor (proximity to war front)	-0.06936	0.0529	-1.311	0.1903
Age (25-34)	-0.04418	0.1401	-0.3153	0.7527
Age (35-44)	-0.0855	0.1367	-0.6255	0.5319
Age (45-54)	-0.06274	0.1356	-0.4626	0.6438
Age (55-64)	-0.0517	0.1347	-0.3838	0.7013
Age (65+)	-0.1066	0.1357	-0.7857	0.4324
Sex (Male)	-0.04853	0.02454	-1.978	0.04839
Sex (Own answer)	0.248	0.12	2.066	0.03918
Sex (Prefer not to say)	-0.2698	0.2891	-0.9334	0.351
Employment status	-0.001716	0.005658	-0.3033	0.7617
Education (high school)	0.1141	0.1178	0.9682	0.3333
Education (vocational training)	0.1176	0.1162	1.011	0.3122
Education (incomplete higher)	0.09248	0.1202	0.7691	0.4421
Education (bachelors)	0.08205	0.1205	0.6811	0.4961

	Estimate	Std. Error	t value	Pr(>|t|)
Education (masters/specialist)	0.06703	0.1165	0.5754	0.5652
Education (PhD)	0.1236	0.1336	0.9249	0.3554
Military service (no)	-0.05766	0.05684	-1.014	0.3108
Geography factor (Kyiv included)	-0.04646	0.03423	-1.357	0.1751
Interest in politics (1)	-0.1378	0.1478	-0.932	0.3517
Interest in politics (2)	0.1164	0.136	0.8556	0.3925
Interest in politics (3)	0.01027	0.1227	0.08367	0.9333
Interest in politics (4)	-0.1407	0.1265	-1.112	0.2665
Interest in politics (5)	-0.06017	0.1156	-0.5206	0.6029
Interest in politics (6)	-0.0126	0.1184	-0.1064	0.9153
Interest in politics (7)	-0.007364	0.1169	-0.06298	0.9498
Interest in politics (8)	-0.03322	0.1172	-0.2836	0.7768
Interest in politics (9)	-0.01679	0.1192	-0.1408	0.8881
Interest in politics (10)	-0.01543	0.1165	-0.1324	0.8947
Interaction (T1 and geo dummy)	0.08776	0.06272	1.399	0.1622
Interaction (T2 and geo dummy)	0.08985	0.06797	1.322	0.1867
Interaction (T3 and geo dummy)	0.2047	0.06795	3.012	0.002698

In general, even though the results of the hypothesis testing are not corresponding with the theory, I have gained very valuable indicators of statistical significance. For the explicit attitudes we see significant effect of all of three treatments in some parts of the population, even though this effect is opposite to what we expected. Talking about separate questions in the dependent variable of explicit attitudes we may definitely conclude that the war effected the attitudes in the sphere of modern sexism and traditional gender norms, but rather in negative way. People becoming more conservative because of the experiencing both anger and anxiety.

The only positive effect that we may see for the explicit attitudes is the interaction of the treatment 3 (anxiety and anger together) and the fact of living in specific regions at the moments of the beginning of the war. Respondents from the regions that were not under heavy fire showed the raise in the more progressive and egalitarian attitudes towards gender norms.

And for the regions that were exposed to the more intensive shelling it is the opposite. Both Treatment 1 and treatment 3 in the interection with this regions showed significant shift towards more conservative perspective on the gender norms. It makes us think from the other angle: maybe when the danger is too close people are not really to accept any changes and rather rely

on the familiar actions, but the same time if the danger is still present, but its is further away the strive for the victory of any cost (even if there is a need to change the values) is more prevalent. Then, probably another way of looking at it could be: the anxiety and anger may have an effect on the attitudes towards gender norms making them more progressive only when they do not reach very high levels.

In terms of implicit attitudes we only see the more conservative effect of the treatments. The anxiety only may influence people from 35 years old become rather more conservative. Anger separately triggers the development of more conservative implicit attitudes towards gender norms for some of the regions, not depending on whether they were intensively shelled or not, whereas anger mixed with anxiety has high impact on the increase in more conservative sentiments for the most fired regions.

Overall, we may conclude, that the expected results of the emotions hypothesis we see only in case of the regions who experienced the intensive war experience and direct danger the less in comparison to others. In the case of experiencing both anxiety and anger, which are the main emotions during the war and it is difficult to separate them, attitudes towards gender norms indeed can become more liberal, but only in the case if the shelling is not very close.

But the same time we may see strong opposite effects, which are not in line with our hypothesis, but the same time very significant and do not let us to reject the null hypothesis. If the war is happening not just in the country of respondents, but its scene is geographically very close physically, the effect of the experienced emotions will be opposite to what we expected. These emotions in combination with closeness to the military actions makes people to become more conservative in terms of their attitudes towards gender norms.

6.3 Hypothesis 2: representation in army.

In this part I will address the results of linear models with the aim to explore the relationship between representation of women in the Ukrainian army and the attitudes towards gender norms of respondents. The expectation was that forth treatment group will consider the presence of women in the army as more prevalent because of the easiness of recalling the stories and hence will have more feminist attitudes. The fifth group in opposite was expected to have difficulties

of recalling three instead of one stories about the women in the army and hence, thought it was less prevalent and had the less conservative attitudes. Let us examine the results.

If I regress both explicit and implicit attitudes (separately) on the treatment groups, I have similar results as in the case of emotion (Tables 11-12). For explicit attitudes representation treatment has negative effect and has too high p-value to be significant. In the results of the model for implicit attitudes we may witness negative effect for the treatment group 4 and positive impact for the treatment group 5. This is corresponding to our expectation, people who was recalling only one story had more feminist attitudes than those who was trying to recall three. But, unfortunately, in both cases the effect size is very low and not significant.

Following the strategy from the testing the first hypothesis I also have fitted the models for each of the question in explicit attitudes. You can find it in the appendices. No significant effect of the treatment was found in this analysis.

Table 11: Linear regression model 5.

	Estimate	Std. Error	t value	Pr(>|t|)
Control group	7.522	0.05952	126.4	0
Treatment 4 (explicit)	-0.0109	0.08083	-0.1349	0.8928
Treatment 5 (explicit)	-0.003622	0.08644	-0.0419	0.9666

Table 12: Linear regression model 6.

	Estimate	Std. Error	t value	Pr(>|t|)
Control group	-0.2025	0.02234	-9.064	3.493e-18
Treatment 4 (implicit)	0.00881	0.03034	0.2904	0.7716
Treatment 5 (implicit)	-0.004599	0.03244	-0.1418	0.8873

To investigate the relationship further I repeated the strategy of the previous treatment and decided to fit the model for the controls. In the table above you may see that two factors may be important for explicit attitudes in the representation hypothesis: geographical factor and interest in politics. If the person lived in Kharkiv region when the war started there is a higher possibility that their attitudes towards gender norms will be more progressive. And if the the person is highly interested in politics it also may influence the attitudes (tables can be found in

the Appendix A). But, unfortunately, it does not give us any information about the effect of the treatment.

For the implicit attitudes we may also see two factors that can effect the attitudes: level if education and geography. The models can be found in the Apendix A. The effect size suggests that the higher education the person has, the more progressive attitudes one will have. Also if the person lived in Dnipropetrovsk, Kirovohrad or Chernihiv regions there are also higher chances that the effect will be more progressive (but negative in the model because of the specificity of D-score).

As in the previous hypothesis I will check the relationship of the variables through the heterogeneity testing. Following the control check, for explicit attitudes I will discuss the education and geography factor and for implicit attitudes it will be age and geography. All the linear models you may see in the appendices.

Education factor showed a significance in interaction with the treatment group 4 for the explicit attitudes. If the person has PhD degree and had to remember only one story about women in the military their attitudes are significantly more progressive than control group.

The other significant factor for explicit attitudes in representation hypothesis is geography. If the person lived in Mykolaiv or Kherson and remembered only one story about women in the army, they has more liberal attitudes towards gender norms than control group. Moreover, if the person remembered three stories and still lived in Kherson they still had more feminist attitudes. Kiev region in interaction with remembering three stories about women in the army is oppositely gave the negative results - respondents had more conservative views in comparison with control group.

As for implicit attitudes, it is also two main factors that showed the statistical significance in interaction with treatment groups: age and geography. As we may see in the models (Apendix A), if people in the age of 25-34 and from 45 tp 65+ lived in the regions Dnipropetrovsk, Zhytomyr, Zakarpattia and Zaporizhia, respectively and the same time remembered only one story about women in the army, they had less progressive attitudes than control group.

For geography factor in interaction with treatments there is no clear sign of the specific effects from two different treatment. We may clearly see the positive effect for the people re-

ceiving the treatment four and being from Kharkiv, Chernihiv, Dnipropetrovsk and Zaporizhia. Their attitudes are more feminist than those from the control group. The same effect is for the people from Mykolaiv, but who received the fifth treatment. The negative effect appeared to be for people lived in Zhytomyr region, no matter which treatment they got.

As the most valuable results for the emotions treatment we have got through the distinguishing the more shelled regions and the less, I will conduct the same check for the representation hypothesis. These models also show statistically significant results. The manipulation with explicit attitudes shows the effect in both groups of treatment - no matter whether respondents were recalling one or three stories about women soldiers, if they were from the closest to the war scene regions their attitudes were becoming more conservative and the effect is the same size (Table 13).

Table 13: Linear regression model 7.

	Estimate	Std. Error	t value	Pr(>|t|)
Control group	7.284	0.7678	9.487	1.547e-19
Treatment group 4 (explicit)	-0.153	0.09804	-1.561	0.1193
Treatment group 5 (explicit)	-0.1257	0.1054	-1.192	0.2338
Geography factor (proximity to war front)	-0.4	0.1532	-2.612	0.00931
Age (25-34)	-0.3645	0.5394	-0.6758	0.4995
Age (35-44)	-0.09389	0.5285	-0.1776	0.8591
Age (45-54)	-0.129	0.5275	-0.2446	0.8069
Age (55-64)	-0.09595	0.5283	-0.1816	0.856
Age (65+)	-0.1349	0.5296	-0.2548	0.799
Sex (Male)	-0.266	0.07733	-3.44	0.0006382
Sex (Own answer)	-0.4373	0.5238	-0.8347	0.4043
Employment status	0.003151	0.01788	0.1762	0.8602
Education (high school)	-0.04311	0.5366	-0.08033	0.936
Education (vocational training)	0.189	0.5353	0.3532	0.7241
Education (incomplete higher)	0.3696	0.541	0.6833	0.4948
Education (bachelors)	0.07388	0.5466	0.1352	0.8925
Education (masters/specialist)	0.1897	0.534	0.3553	0.7226
Education (PhD)	0.1734	0.5634	0.3077	0.7585
Military service (no)	-0.02549	0.1759	-0.1449	0.8849
Geography factor (Kyiv included)	0.005527	0.1011	0.05468	0.9564
Interest in politics (1)	0.1251	0.3876	0.3227	0.7471
Interest in politics (2)	0.5047	0.3922	1.287	0.1988
Interest in politics (3)	0.2748	0.291	0.9444	0.3455
Interest in politics (4)	0.1917	0.3247	0.5904	0.5553
Interest in politics (5)	0.3648	0.2642	1.381	0.168
Interest in politics (6)	0.3329	0.2758	1.207	0.228
Interest in politics (7)	0.4103	0.2661	1.542	0.1238
Interest in politics (8)	0.404	0.2697	1.498	0.1349
Interest in politics (9)	0.5563	0.2833	1.963	0.05023
Interest in politics (10)	0.5303	0.2645	2.005	0.0456
Interaction (T4 and geo dummy)	0.509	0.1743	2.919	0.003688
Interaction (T5 and geo dummy)	0.4841	0.1882	2.572	0.01044

What is interesting is that in terms of implicit attitudes we have the opposite results. We do not have significant effect for the group that was recalling three stories, but the group who was recalling one story and lived in the zones that were exposed to the shelling the most showed the significant positive effect Table 14). Respondents from this group showed the change of the

implicit attitudes towards more feminist.

Table 14: Linear regression model 8.

	Estimate	Std. Error	t value	Pr(>|t|)
Control group	0.4838	0.2918	1.658	0.09799
Treatment group 4 (implicit)	0.06029	0.03726	1.618	0.1063
Treatment group 5 (implicit)	0.02235	0.04007	0.5579	0.5772
Geography factor (proximity to war front)	0.07096	0.0582	1.219	0.2234
Age (25-34)	-0.2641	0.205	-1.288	0.1983
Age (35-44)	-0.2629	0.2009	-1.309	0.1912
Age (45-54)	-0.2686	0.2005	-1.34	0.181
Age (55-64)	-0.2573	0.2008	-1.282	0.2006
Age (65+)	-0.318	0.2013	-1.58	0.1148
Sex (Male)	-0.02324	0.02939	-0.7907	0.4296
Sex (Own answer)	-0.2362	0.1991	-1.186	0.2361
Employment status	0.003969	0.006797	0.5839	0.5596
Education (high school)	-0.3883	0.2039	-1.904	0.05756
Education (vocational training)	-0.3712	0.2034	-1.825	0.06871
Education (incomplete higher)	-0.3684	0.2056	-1.792	0.07382
Education (bachelors)	-0.4886	0.2077	-2.352	0.0191
Education (masters/specialist)	-0.4335	0.203	-2.136	0.03324
Education (PhD)	-0.4661	0.2141	-2.177	0.03002
Military service (no)	-0.07615	0.06687	-1.139	0.2554
Geography factor (Kyiv included)	0.03096	0.03841	0.806	0.4207
Interest in politics (1)	0.1329	0.1473	0.902	0.3676
Interest in politics (2)	-0.07985	0.149	-0.5358	0.5924
Interest in politics (3)	0.06152	0.1106	0.5564	0.5782
Interest in politics (4)	-0.06855	0.1234	-0.5556	0.5788
Interest in politics (5)	0.02984	0.1004	0.2972	0.7664
Interest in politics (6)	0.01258	0.1048	0.1201	0.9045
Interest in politics (7)	0.03579	0.1011	0.3539	0.7236
Interest in politics (8)	0.009188	0.1025	0.08964	0.9286
Interest in politics (9)	0.02289	0.1077	0.2125	0.8318
Interest in politics (10)	0.02899	0.1005	0.2884	0.7732
Interaction (T4 and geo dummy)	-0.1471	0.06626	-2.219	0.02697
Interaction (T5 and geo dummy)	-0.08141	0.07153	-1.138	0.2557

In general, for the representation hypothesis we have significant results when the manipulation is interacted with the region where the person lived in the beginning of the war. We may see, that the location of people play crucial role whether they will be exposed to the social change or not. We clearly see the effect of representation of women in the army for the people

who were exposed to the direct danger the most - their explicit attitudes towards gender norms become more conservative. But the one outcome that corresponds with my hypothesis is change in implicit attitudes caused by higher representation of women in the military. People who were recalling only one story, hence, imagined this situation to be more prevalent, had actually an increase in implicit attitudes.

7 Conclusion

Current research was motivated by interest in interconnection between war and gender applied to the ongoing war in Ukraine. The research question was formulated to identify whether a war, aside from all terrible consequences, may bring social change in the form of a shift in people's attitudes towards gender norms. To answer this question, two types of analyses were conducted: sentiment and emoji analysis of Telegram channels for descriptive purposes and an online survey-experiment for investigation of causal relationships. The results of sentiment analysis were presented in graphs. The data from survey-experiment was analysed through linear regression models.

Before going to the main results of the study, its limitations should be addressed. The first main but obvious obstacle is the state of war in Ukraine, it definitely affected variance of the sample. Most of the respondents were older than 45 years old, which can be easily explained by the major younger part of the country being recruited to the army or engaged in other urgent activities.

Second limitation is the size of the survey-experiment. Even though it is a useful and simple tool for data collection, the need of this exact research led to a quite extensive survey. As I wanted to measure implicit attitudes as well as explicit ones, there was no other way than to extend the survey and take a risk. Even though the final data set had enough responses for the analysis, three times more responses were collected, but not finished completely. People stopped filling the survey almost always at the Implicit relation Association procedure stage.

Despite the limitations, the collected data was still enough to conduct the research and have significant results. The first hypothesis was dedicated to the impact of emotions like anger and anxiety caused by war on attitudes towards gender norms. The theoretical expectation was that anxiety will shift attitudes towards more liberal viewpoints and anger oppositely towards more conservative ones. The results of the analysis are partly corresponding to our expectations.

For both explicit and implicit attitudes towards gender norms a rather conservative shift was identified. For specific types of explicit gender prejudice – modern sexism and traditional gender roles – the effect of anxiety and anger combined and anger separately was found respectively, which goes in line with our theory. The important discovery was that the crucial part of

the effect was connected to respondents' place of residence at the beginning of the war. For the regions which were under massive military attack, a conservative shift in attitudes because of experiencing anxiety and anger together was revealed. The opposite finding was for explicit attitudes in regions that were less in danger: people had a shift towards more progressive attitudes to gender norms when experiencing both anxiety and anger.

The main assumption of this research was based on possibility of anxiety, being one of the main emotions experienced during the war, influencing attitudes towards gender norms in a more feminist way in comparison to anger and mixed emotional experience. But in fact, this research gained the valuable results rather for anger and anxiety. The statistically significant relationship between anxiety and feminist attitudes was not established, but the relation between anger and conservative ones was. This claim has even more power in respect to geography – as we have seen, the stronger conservative effect is in the areas which were close to the war front. It makes our claim about the connection between war and gender attitudes even more pronounced because people in these regions experience the war itself more intensively in comparison to other regions.

In general, it is possible to conclude that the results of the analysis supports the first hypothesis. Certain emotions experienced during the war indeed may lead to change of attitudes towards gender norms. As for sub-hypotheses, both of them can be rejected, as the support for the effect of anxiety was not found and the anger affects the attitudes, making them even more conservative rather than just maintains their pre-war state.

The analysis for the second hypothesis has also shown significant results, which also stated the importance of the respondent's location at the beginning of war. We may claim that representation of women in the army for the regions that were extensively shelled leads to deterioration of the egalitarian views. But, surprisingly, the implicit attitudes are affected in the opposite way – people who were recalling only one story about women soldiers and at the same time were from the dangerous regions showed an increase in progressive attitudes towards gender norms. Overall, the second hypothesis is partly supported by the findings of this research. Only implicit attitudes towards gender norms is affected by representation of women in the army in the way we expected. Explicit attitudes had the opposite effect.

Both hypotheses found partial confirmation. The main finding of the whole analysis that the

war may has very different effects on people from different parts of the country. In the case of current research, the factor of proximity to direct danger appeared to be crucial. The research question can be answered directly – war indeed has a potential to change the attitudes towards gender norms among people.

Overall, the employed theoretical framework appeared to be suitable for this specific research and I see a big potential for development of the topic in this direction. As we have seen through the analysis, the war indeed causes change in the perception of gender norms, and the variety of specific mechanisms that emerge during war is wide. Further research on this topic can be focused on closer exploration of the effect of anxiety on attitudes and possibly different methodological approach to shed light on this relationship. Moreover, closer attention should be paid to distinguishing between different parts of the country affected by war, and development of possible causal mechanism based on this factor promises to be very insightful.

8 References

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9   Appendix A

9.1   Suplementary linear models

1. Explicit attitudes (separate questions) for T1-T3

Table 15: Linear regression model 9.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	4.297	0.2456	17.5	7.39e-57
group_forlm_em1	-0.2324	0.3501	-0.6638	0.5071
group_forlm_em2	-0.2706	0.3694	-0.7324	0.4642
group_forlm_em3	-0.6324	0.3694	-1.712	0.08736

2. Explicit attitudes (separate questions) for T1-T3

Table 16: Linear regression model 10

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	3.771	0.2545	14.82	3.126e-43
group_forlm_em1	-0.1203	0.3628	-0.3316	0.7403
group_forlm_em2	-0.6458	0.3829	-1.687	0.0921
group_forlm_em3	-0.4485	0.3829	-1.171	0.2419

3. Controls for T1-T3 (explicit)

Table 17: Linear regression mode11.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	7.257	0.5441	13.34	6.465e-36
group_forlm_em1	-0.02735	0.07654	-0.3573	0.721
group_forlm_em2	0.0359	0.08084	0.4441	0.6571
group_forlm_em3	-0.01222	0.08008	-0.1526	0.8787
Q2_fact3	-0.473	0.3549	-1.333	0.183
Q2_fact4	-0.3112	0.3472	-0.8964	0.3704
Q2_fact5	-0.1814	0.3439	-0.5275	0.598
Q2_fact6	-0.2856	0.3415	-0.8364	0.4033
Q2_fact7	-0.439	0.3436	-1.278	0.2018
Q3_fact2	-0.2273	0.06324	-3.594	0.000351
Q3_fact4	0.3163	0.3056	1.035	0.3011
Q3_fact5	0.2906	0.7669	0.3789	0.7049
Q4…22	0.01818	0.0144	1.263	0.2071
Q5_fact4	-0.2208	0.3017	-0.7319	0.4645
Q5_fact5	-0.1725	0.2964	-0.5821	0.5607
Q5_fact6	-0.1286	0.3082	-0.4174	0.6765
Q5_fact7	-0.1993	0.3087	-0.6456	0.5188
Q5_fact8	-0.08265	0.298	-0.2773	0.7816

	Estimate	Std. Error	t value	Pr(>|t|)
Q5_fact9	0.3723	0.3425	1.087	0.2775
Q6…242	-0.0737	0.1445	-0.5102	0.6101
Q7…25_fact2	0.006914	0.2064	0.03349	0.9733
Q7…25_fact3	0.08409	0.1748	0.481	0.6307
Q7…25_fact4	-0.2551	0.2486	-1.026	0.3051
Q7…25_fact5	-0.05533	0.2071	-0.2672	0.7894
Q7…25_fact6	0.05207	0.2085	0.2498	0.8028
Q7…25_fact7	-0.006439	0.1804	-0.03568	0.9715
Q7…25_fact8	-0.06401	0.21	-0.3048	0.7606
Q7…25_fact9	-0.08238	0.165	-0.4994	0.6177
Q7…25_fact10	0.1829	0.2301	0.7949	0.427
Q7…25_fact12	0.2551	0.3315	0.7697	0.4418
Q7…25_fact13	-0.1063	0.1743	-0.6099	0.5422
Q7…25_fact14	-0.01539	0.1989	-0.07736	0.9384
Q7…25_fact15	-0.1868	0.1856	-1.006	0.3146
Q7…25_fact16	0.03398	0.1942	0.175	0.8611
Q7…25_fact17	-0.08874	0.2433	-0.3647	0.7154
Q7…25_fact18	0.2966	0.1998	1.485	0.1381
Q7…25_fact19	-0.3121	0.2663	-1.172	0.2416
Q7…25_fact20	-0.004825	0.1778	-0.02714	0.9784
Q7…25_fact21	0.1427	0.2621	0.5442	0.5865
Q7…25_fact22	0.06222	0.357	0.1743	0.8617
Q7…25_fact23	0.05211	0.2154	0.2419	0.8089
Q7…25_fact24	0.02256	0.2177	0.1037	0.9175
Q7…25_fact25	-0.2092	0.2831	-0.7389	0.4603
Q58_fact1	0.8176	0.3828	2.136	0.0331
Q58_fact2	0.6724	0.35	1.921	0.05517
Q58_fact3	0.5001	0.3129	1.598	0.1105
Q58_fact4	0.648	0.3217	2.015	0.04437
Q58_fact5	0.6459	0.2951	2.189	0.02897
Q58_fact6	0.8621	0.3029	2.846	0.004568
Q58_fact7	0.8411	0.2983	2.82	0.004952
Q58_fact8	0.8802	0.299	2.944	0.003364
Q58_fact9	0.9442	0.3049	3.096	0.002047
Q58_fact10	1.024	0.2969	3.449	0.0005993

4. Controls for T1-T3 (implicit)

Table 18: Linear regression model 12

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.05189	0.2181	0.2379	0.812
group_forlm_em1	-0.02866	0.03069	-0.9339	0.3507

	Estimate	Std. Error	t value	Pr(>|t|)
group_forlm_em2	0.01261	0.03241	0.3891	0.6973
group_forlm_em3	-0.04973	0.0321	-1.549	0.1219
Q2_fact3	-0.06293	0.1423	-0.4423	0.6584
Q2_fact4	-0.1007	0.1392	-0.7237	0.4695
Q2_fact5	-0.07767	0.1379	-0.5633	0.5734
Q2_fact6	-0.06933	0.1369	-0.5064	0.6128
Q2_fact7	-0.1211	0.1377	-0.8793	0.3796
Q3_fact2	-0.04709	0.02535	-1.857	0.06373
Q3_fact4	0.2253	0.1225	1.839	0.06636
Q3_fact5	-0.1348	0.3075	-0.4386	0.6611
Q4…22	-0.002093	0.005772	-0.3627	0.717
Q5_fact4	0.07235	0.121	0.5981	0.55
Q5_fact5	0.06508	0.1188	0.5477	0.5841
Q5_fact6	0.04701	0.1236	0.3804	0.7038
Q5_fact7	0.01872	0.1238	0.1513	0.8798
Q5_fact8	0.01158	0.1195	0.09694	0.9228
Q5_fact9	0.06695	0.1373	0.4875	0.6261
Q6…242	-0.05529	0.05791	-0.9547	0.3401
Q7…25_fact2	-0.03254	0.08276	-0.3931	0.6943
Q7…25_fact3	-0.09096	0.07009	-1.298	0.1948
Q7…25_fact4	-0.001571	0.09966	-0.01576	0.9874
Q7…25_fact5	-0.07091	0.08301	-0.8542	0.3933
Q7…25_fact6	-0.001198	0.08357	-0.01433	0.9886
Q7…25_fact7	-0.02874	0.07234	-0.3973	0.6913
Q7…25_fact8	-0.03602	0.08421	-0.4277	0.669
Q7…25_fact9	-0.09209	0.06613	-1.392	0.1643
Q7…25_fact10	-0.07505	0.09224	-0.8137	0.4161
Q7…25_fact12	0.04692	0.1329	0.3531	0.7242
Q7…25_fact13	-0.0357	0.06987	-0.511	0.6095
Q7…25_fact14	-0.08797	0.07976	-1.103	0.2705
Q7…25_fact15	-0.1667	0.07439	-2.241	0.02539
Q7…25_fact16	-0.008999	0.07785	-0.1156	0.908
Q7…25_fact17	0.06079	0.09755	0.6232	0.5334
Q7…25_fact18	-0.03731	0.08009	-0.4659	0.6414
Q7…25_fact19	-0.08377	0.1068	-0.7846	0.433
Q7…25_fact20	-0.08792	0.07127	-1.234	0.2178
Q7…25_fact21	-0.004025	0.1051	-0.0383	0.9695
Q7…25_fact22	0.01605	0.1431	0.1121	0.9108
Q7…25_fact23	-0.06989	0.08635	-0.8094	0.4186
Q7…25_fact24	-0.01957	0.08726	-0.2242	0.8227
Q7…25_fact25	-0.1662	0.1135	-1.465	0.1436
Q58_fact1	-0.1127	0.1535	-0.7342	0.4631
Q58_fact2	0.1389	0.1403	0.9898	0.3227
Q58_fact3	0.01028	0.1254	0.08198	0.9347
Q58_fact4	-0.1614	0.129	-1.251	0.2113
Q58_fact5	-0.05804	0.1183	-0.4906	0.6239
Q58_fact6	-0.0193	0.1214	-0.159	0.8738

	Estimate	Std. Error	t value	Pr(>|t|)
Q58_fact7	-0.005375	0.1196	-0.04495	0.9642
Q58_fact8	-0.03092	0.1199	-0.258	0.7965
Q58_fact9	-0.004081	0.1223	-0.03338	0.9734
Q58_fact10	-0.01371	0.119	-0.1152	0.9083

5. Interaction with geographical factor for T1-T3(explicit)

Table 19: Linear regression model 13 (continued below)

	Estimate	Std. Error	t value
(Intercept)	7.901	0.6549	12.07
group_forlm_em1	-0.3114	0.4435	-0.7021
group_forlm_em2	-0.2762	0.4518	-0.6112
group_forlm_em3	-0.6534	0.4669	-1.4
Q7…25_fact2	-0.0834	0.4544	-0.1835
Q7…25_fact3	-0.365	0.4162	-0.8771
Q7…25_fact4	-0.2422	0.5491	-0.4411
Q7…25_fact5	-0.5438	0.4422	-1.23
Q7…25_fact6	-0.2407	0.4482	-0.537
Q7…25_fact7	-0.1369	0.4167	-0.3285
Q7…25_fact8	-0.4865	0.442	-1.101
Q7…25_fact9	-0.6469	0.391	-1.655
Q7…25_fact10	-0.498	0.565	-0.8814
Q7…25_fact12	0.1805	0.5842	0.309
Q7…25_fact13	-0.5603	0.398	-1.408
Q7…25_fact14	0.02678	0.4546	0.05891
Q7…25_fact15	-0.3697	0.4201	-0.88
Q7…25_fact16	-0.4097	0.5102	-0.8029
Q7…25_fact17	0.02247	0.5507	0.04081
Q7…25_fact18	0.2958	0.445	0.6648
Q7…25_fact19	-0.7642	0.4458	-1.714
Q7…25_fact20	-0.2765	0.4065	-0.6803
Q7…25_fact21	-0.3653	0.6325	-0.5775
Q7…25_fact22	1.375	0.8081	1.701
Q7…25_fact23	-0.4746	0.417	-1.138
Q7…25_fact24	-0.4546	0.4529	-1.004
Q7…25_fact25	-0.9055	0.5691	-1.591
Q2_fact3	-0.7057	0.3667	-1.924
Q2_fact4	-0.5272	0.3574	-1.475
Q2_fact5	-0.4169	0.3568	-1.168
Q2_fact6	-0.5198	0.3527	-1.474
Q2_fact7	-0.6715	0.3546	-1.894
Q3_fact2	-0.1925	0.06583	-2.925

	Estimate	Std. Error	t value
Q3_fact4	0.3693	0.3138	1.177
Q3_fact5	-0.09775	0.877	-0.1115
Q4…22	0.01611	0.01488	1.082
Q5_fact4	-0.2689	0.3222	-0.8347
Q5_fact5	-0.271	0.3193	-0.8487
Q5_fact6	-0.2521	0.3292	-0.7657
Q5_fact7	-0.3055	0.3317	-0.9209
Q5_fact8	-0.1549	0.3209	-0.4829
Q5_fact9	0.2847	0.3661	0.7775
Q6…242	-0.04709	0.1505	-0.3129
Q58_fact1	0.8649	0.4137	2.091
Q58_fact2	0.6175	0.3649	1.692
Q58_fact3	0.4452	0.3289	1.353
Q58_fact4	0.6212	0.3363	1.847
Q58_fact5	0.6338	0.3097	2.047
Q58_fact6	0.8621	0.3181	2.71
Q58_fact7	0.8283	0.3135	2.643
Q58_fact8	0.848	0.3138	2.702
Q58_fact9	0.8975	0.3179	2.823
Q58_fact10	0.9864	0.3108	3.174
group_forlm_em1:Q7…25_fact2	0.09519	0.5736	0.166
group_forlm_em2:Q7…25_fact2	-0.2217	0.6389	-0.3469
group_forlm_em3:Q7…25_fact2	0.1196	0.6475	0.1847
group_forlm_em1:Q7…25_fact3	0.2976	0.5142	0.5788
group_forlm_em2:Q7…25_fact3	0.5633	0.5338	1.055
group_forlm_em3:Q7…25_fact3	0.8895	0.5511	1.614
group_forlm_em1:Q7…25_fact4	0.1093	0.7313	0.1495
group_forlm_em2:Q7…25_fact4	-0.2239	0.7098	-0.3154
group_forlm_em3:Q7…25_fact4	0.03776	0.7511	0.05027
group_forlm_em1:Q7…25_fact5	1.116	0.604	1.848
group_forlm_em2:Q7…25_fact5	0.188	0.571	0.3293
group_forlm_em3:Q7…25_fact5	0.7958	0.676	1.177
group_forlm_em1:Q7…25_fact6	0.1466	0.6258	0.2342
group_forlm_em2:Q7…25_fact6	0.01705	0.5721	0.0298
group_forlm_em3:Q7…25_fact6	1.376	0.6773	2.032
group_forlm_em1:Q7…25_fact7	0.01207	0.5215	0.02315
group_forlm_em2:Q7…25_fact7	0.03563	0.5657	0.06299
group_forlm_em3:Q7…25_fact7	0.3247	0.5568	0.5832
group_forlm_em1:Q7…25_fact8	-0.05466	0.6217	-0.08792
group_forlm_em2:Q7…25_fact8	0.3073	0.6682	0.4599
group_forlm_em3:Q7…25_fact8	1.049	0.5891	1.78
group_forlm_em1:Q7…25_fact9	0.4603	0.4941	0.9315
group_forlm_em2:Q7…25_fact9	0.5093	0.5053	1.008
group_forlm_em3:Q7…25_fact9	1.147	0.5103	2.247
group_forlm_em1:Q7…25_fact10	0.9393	0.801	1.173
group_forlm_em2:Q7…25_fact10	0.7643	0.6786	1.126
group_forlm_em3:Q7…25_fact10	0.8894	0.7319	1.215

	Estimate	Std. Error	t value
group_forlm_em1:Q7…25_fact12	-0.001481	0.7361	-0.002011
group_forlm_em1:Q7…25_fact13	0.6156	0.5152	1.195
group_forlm_em2:Q7…25_fact13	0.5088	0.5331	0.9545
group_forlm_em3:Q7…25_fact13	0.7158	0.5255	1.362
group_forlm_em1:Q7…25_fact14	-0.1443	0.5838	-0.2472
group_forlm_em2:Q7…25_fact14	0.2873	0.6058	0.4743
group_forlm_em3:Q7…25_fact14	-0.3889	0.6049	-0.6429
group_forlm_em1:Q7…25_fact15	0.04595	0.5453	0.08426
group_forlm_em2:Q7…25_fact15	0.2697	0.549	0.4913
group_forlm_em3:Q7…25_fact15	0.2585	0.5629	0.4593
group_forlm_em1:Q7…25_fact16	0.6499	0.6064	1.072
group_forlm_em2:Q7…25_fact16	0.114	0.6189	0.1842
group_forlm_em3:Q7…25_fact16	0.8949	0.6467	1.384
group_forlm_em1:Q7…25_fact17	-0.7014	0.7307	-0.96
group_forlm_em2:Q7…25_fact17	-0.189	0.7435	-0.2542
group_forlm_em3:Q7…25_fact17	0.2798	0.6977	0.401
group_forlm_em1:Q7…25_fact18	-0.1478	0.5612	-0.2633
group_forlm_em2:Q7…25_fact18	0.08336	0.5978	0.1394
group_forlm_em3:Q7…25_fact18	-0.1322	0.6237	-0.212
group_forlm_em1:Q7…25_fact19	0.3035	0.722	0.4203
group_forlm_em3:Q7…25_fact19	1.71	0.8891	1.923
group_forlm_em1:Q7…25_fact20	0.09033	0.5078	0.1779
group_forlm_em2:Q7…25_fact20	0.3895	0.5506	0.7075
group_forlm_em3:Q7…25_fact20	0.6	0.5551	1.081
group_forlm_em1:Q7…25_fact21	0.8581	0.7489	1.146
group_forlm_em2:Q7…25_fact21	0.4672	0.8087	0.5776
group_forlm_em3:Q7…25_fact21	-0.7331	1.005	-0.7297
group_forlm_em1:Q7…25_fact22	-1.557	0.9891	-1.574
group_forlm_em3:Q7…25_fact22	-1.551	1.005	-1.544
group_forlm_em1:Q7…25_fact23	0.7112	0.6415	1.109
group_forlm_em2:Q7…25_fact23	0.8376	0.6452	1.298
group_forlm_em3:Q7…25_fact23	1.078	0.6537	1.649
group_forlm_em1:Q7…25_fact24	0.2996	0.5951	0.5034
group_forlm_em2:Q7…25_fact24	0.7977	0.6383	1.25
group_forlm_em3:Q7…25_fact24	0.8744	0.6905	1.266
group_forlm_em1:Q7…25_fact25	0.6241	0.9505	0.6566
group_forlm_em2:Q7…25_fact25	1.043	0.8105	1.287
group_forlm_em3:Q7…25_fact25	1.083	0.7692	1.408

	Pr(>|t|)
(Intercept)	5.547e-30
group_forlm_em1	0.4829
group_forlm_em2	0.5413
group_forlm_em3	0.1622
Q7…25_fact2	0.8544

	Pr(>|t|)
Q7…25_fact3	0.3808
Q7…25_fact4	0.6593
Q7…25_fact5	0.2192
Q7…25_fact6	0.5915
Q7…25_fact7	0.7427
Q7…25_fact8	0.2715
Q7…25_fact9	0.09857
Q7…25_fact10	0.3785
Q7…25_fact12	0.7574
Q7…25_fact13	0.1597
Q7…25_fact14	0.953
Q7…25_fact15	0.3792
Q7…25_fact16	0.4223
Q7…25_fact17	0.9675
Q7…25_fact18	0.5065
Q7…25_fact19	0.08705
Q7…25_fact20	0.4966
Q7…25_fact21	0.5638
Q7…25_fact22	0.08951
Q7…25_fact23	0.2556
Q7…25_fact24	0.3159
Q7…25_fact25	0.1121
Q2_fact3	0.05483
Q2_fact4	0.1408
Q2_fact5	0.2431
Q2_fact6	0.1411
Q2_fact7	0.0588
Q3_fact2	0.003585
Q3_fact4	0.2397
Q3_fact5	0.9113
Q4…22	0.2796
Q5_fact4	0.4042
Q5_fact5	0.3964
Q5_fact6	0.4442
Q5_fact7	0.3575
Q5_fact8	0.6294
Q5_fact9	0.4372
Q6…242	0.7545
Q58_fact1	0.03699
Q58_fact2	0.09121
Q58_fact3	0.1765
Q58_fact4	0.06524
Q58_fact5	0.04114
Q58_fact6	0.006931
Q58_fact7	0.008456
Q58_fact8	0.007094
Q58_fact9	0.004923

70

	Pr(>|t|)
Q58_fact10	0.001585
group_forlm_em1:Q7…25_fact2	0.8683
group_forlm_em2:Q7…25_fact2	0.7288
group_forlm_em3:Q7…25_fact2	0.8535
group_forlm_em1:Q7…25_fact3	0.563
group_forlm_em2:Q7…25_fact3	0.2917
group_forlm_em3:Q7…25_fact3	0.107
group_forlm_em1:Q7…25_fact4	0.8812
group_forlm_em2:Q7…25_fact4	0.7525
group_forlm_em3:Q7…25_fact4	0.9599
group_forlm_em1:Q7…25_fact5	0.06519
group_forlm_em2:Q7…25_fact5	0.7421
group_forlm_em3:Q7…25_fact5	0.2396
group_forlm_em1:Q7…25_fact6	0.8149
group_forlm_em2:Q7…25_fact6	0.9762
group_forlm_em3:Q7…25_fact6	0.04262
group_forlm_em1:Q7…25_fact7	0.9815
group_forlm_em2:Q7…25_fact7	0.9498
group_forlm_em3:Q7…25_fact7	0.56
group_forlm_em1:Q7…25_fact8	0.93
group_forlm_em2:Q7…25_fact8	0.6458
group_forlm_em3:Q7…25_fact8	0.07562
group_forlm_em1:Q7…25_fact9	0.352
group_forlm_em2:Q7…25_fact9	0.3139
group_forlm_em3:Q7…25_fact9	0.02503
group_forlm_em1:Q7…25_fact10	0.2415
group_forlm_em2:Q7…25_fact10	0.2605
group_forlm_em3:Q7…25_fact10	0.2248
group_forlm_em1:Q7…25_fact12	0.9984
group_forlm_em1:Q7…25_fact13	0.2327
group_forlm_em2:Q7…25_fact13	0.3402
group_forlm_em3:Q7…25_fact13	0.1737
group_forlm_em1:Q7…25_fact14	0.8049
group_forlm_em2:Q7…25_fact14	0.6355
group_forlm_em3:Q7…25_fact14	0.5205
group_forlm_em1:Q7…25_fact15	0.9329
group_forlm_em2:Q7…25_fact15	0.6234
group_forlm_em3:Q7…25_fact15	0.6462
group_forlm_em1:Q7…25_fact16	0.2843
group_forlm_em2:Q7…25_fact16	0.8539
group_forlm_em3:Q7…25_fact16	0.167
group_forlm_em1:Q7…25_fact17	0.3375
group_forlm_em2:Q7…25_fact17	0.7995
group_forlm_em3:Q7…25_fact17	0.6885
group_forlm_em1:Q7…25_fact18	0.7924
group_forlm_em2:Q7…25_fact18	0.8891
group_forlm_em3:Q7…25_fact18	0.8322

	Pr(>|t|)
group_forlm_em1:Q7…25_fact19	0.6744
group_forlm_em3:Q7…25_fact19	0.05494
group_forlm_em1:Q7…25_fact20	0.8589
group_forlm_em2:Q7…25_fact20	0.4795
group_forlm_em3:Q7…25_fact20	0.2802
group_forlm_em1:Q7…25_fact21	0.2524
group_forlm_em2:Q7…25_fact21	0.5637
group_forlm_em3:Q7…25_fact21	0.4659
group_forlm_em1:Q7…25_fact22	0.116
group_forlm_em3:Q7…25_fact22	0.1231
group_forlm_em1:Q7…25_fact23	0.268
group_forlm_em2:Q7…25_fact23	0.1947
group_forlm_em3:Q7…25_fact23	0.09961
group_forlm_em1:Q7…25_fact24	0.6149
group_forlm_em2:Q7…25_fact24	0.2119
group_forlm_em3:Q7…25_fact24	0.2059
group_forlm_em1:Q7…25_fact25	0.5117
group_forlm_em2:Q7…25_fact25	0.1988
group_forlm_em3:Q7…25_fact25	0.1595

6. Interaction with age for T1-T3 (implicit)

Table 21: Linear regression model 14.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.5455	0.3493	1.562	0.1189
group_forlm_em1	-0.6938	0.351	-1.977	0.04853
group_forlm_em2	-0.4876	0.4224	-1.154	0.2488
group_forlm_em3	-0.06373	0.06905	-0.9229	0.3564
Q2_fact3	-0.4579	0.3169	-1.445	0.1489
Q2_fact4	-0.5998	0.312	-1.923	0.05499
Q2_fact5	-0.5687	0.3078	-1.848	0.06512
Q2_fact6	-0.5693	0.3079	-1.849	0.06493
Q2_fact7	-0.6361	0.3019	-2.107	0.03551
Q3_fact2	-0.04494	0.02547	-1.764	0.07823
Q3_fact4	0.2151	0.1233	1.745	0.08145
Q3_fact5	-0.1384	0.3096	-0.447	0.655
Q4…22	-0.0008713	0.005818	-0.1498	0.881
Q5_fact4	0.07425	0.1219	0.609	0.5427
Q5_fact5	0.06128	0.1197	0.5118	0.609
Q5_fact6	0.05193	0.1247	0.4163	0.6774
Q5_fact7	0.01198	0.1251	0.09572	0.9238
Q5_fact8	0.003956	0.1206	0.03281	0.9738

	Estimate	Std. Error	t value	Pr(>|t|)
Q5_fact9	0.06548	0.139	0.4713	0.6376
Q6…242	-0.06055	0.05828	-1.039	0.2992
Q7…25_fact2	-0.03847	0.08314	-0.4627	0.6437
Q7…25_fact3	-0.09415	0.07033	-1.339	0.1812
Q7…25_fact4	0.0122	0.1002	0.1217	0.9032
Q7…25_fact5	-0.07586	0.08434	-0.8994	0.3688
Q7…25_fact6	0.0007669	0.08443	0.009083	0.9928
Q7…25_fact7	-0.02263	0.07244	-0.3124	0.7549
Q7…25_fact8	-0.02464	0.08458	-0.2913	0.7709
Q7…25_fact9	-0.09136	0.06631	-1.378	0.1688
Q7…25_fact10	-0.06572	0.09285	-0.7078	0.4793
Q7…25_fact12	0.03824	0.1336	0.2862	0.7749
Q7…25_fact13	-0.03262	0.07011	-0.4652	0.6419
Q7…25_fact14	-0.07456	0.08025	-0.9291	0.3532
Q7…25_fact15	-0.1697	0.07495	-2.264	0.02392
Q7…25_fact16	-0.01167	0.07811	-0.1494	0.8813
Q7…25_fact17	0.0524	0.09805	0.5344	0.5933
Q7…25_fact18	-0.04204	0.0807	-0.521	0.6026
Q7…25_fact19	-0.08311	0.1077	-0.7717	0.4406
Q7…25_fact20	-0.08959	0.07162	-1.251	0.2115
Q7…25_fact21	-0.003407	0.1057	-0.03223	0.9743
Q7…25_fact22	0.01352	0.1448	0.09334	0.9257
Q7…25_fact23	-0.07273	0.08677	-0.8382	0.4023
Q7…25_fact24	-0.01765	0.0878	-0.201	0.8408
Q7…25_fact25	-0.1777	0.1147	-1.549	0.1218
Q58_fact1	-0.1111	0.155	-0.7167	0.4738
Q58_fact2	0.1672	0.1425	1.173	0.2412
Q58_fact3	0.002023	0.1265	0.01599	0.9872
Q58_fact4	-0.1557	0.1301	-1.197	0.232
Q58_fact5	-0.05751	0.1193	-0.4823	0.6298
Q58_fact6	-0.0249	0.1225	-0.2033	0.839
Q58_fact7	-0.002677	0.1207	-0.02218	0.9823
Q58_fact8	-0.02499	0.1208	-0.2068	0.8362
Q58_fact9	0.006984	0.1234	0.05661	0.9549
Q58_fact10	-0.01109	0.1198	-0.09256	0.9263
group_forlm_em1:Q2_fact3	0.557	0.3688	1.511	0.1314
group_forlm_em2:Q2_fact3	0.4692	0.442	1.061	0.2889
group_forlm_em3:Q2_fact3	-0.1909	0.1313	-1.455	0.1463
group_forlm_em1:Q2_fact4	0.5892	0.3626	1.625	0.1047
group_forlm_em2:Q2_fact4	0.5324	0.4322	1.232	0.2184
group_forlm_em3:Q2_fact4	0.09334	0.1116	0.8362	0.4034
group_forlm_em1:Q2_fact5	0.6723	0.356	1.888	0.05943
group_forlm_em2:Q2_fact5	0.4655	0.4268	1.091	0.2758
group_forlm_em3:Q2_fact5	0.04941	0.1039	0.4754	0.6347
group_forlm_em1:Q2_fact6	0.6937	0.3551	1.953	0.05122
group_forlm_em2:Q2_fact6	0.4838	0.4257	1.137	0.2562
group_forlm_em3:Q2_fact6	0.01722	0.08683	0.1983	0.8429

	Estimate	Std. Error	t value	Pr(>|t|)
group_forlm_em1:Q2_fact7	0.7131	0.3519	2.026	0.04318
group_forlm_em2:Q2_fact7	0.5478	0.4222	1.297	0.195

7. Interaction with geographical factor for T1-T3 (implicit)

Table 22: Linear regression model 15.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.1941	0.2631	0.7375	0.4611
group_forlm_em1	-0.0897	0.1782	-0.5033	0.6149
group_forlm_em2	-0.2239	0.1816	-1.233	0.2179
group_forlm_em3	-0.3179	0.1876	-1.695	0.09071
Q7…25_fact2	-0.06203	0.1826	-0.3397	0.7342
Q7…25_fact3	-0.2775	0.1672	-1.659	0.09765
Q7…25_fact4	-0.2336	0.2206	-1.059	0.2901
Q7…25_fact5	-0.1462	0.1777	-0.8226	0.4111
Q7…25_fact6	-0.2302	0.1801	-1.278	0.2017
Q7…25_fact7	-0.2819	0.1674	-1.683	0.09284
Q7…25_fact8	-0.2974	0.1776	-1.674	0.09461
Q7…25_fact9	-0.2121	0.1571	-1.35	0.1774
Q7…25_fact10	-0.3622	0.227	-1.595	0.1112
Q7…25_fact12	0.1899	0.2347	0.809	0.4189
Q7…25_fact13	-0.1849	0.1599	-1.156	0.2481
Q7…25_fact14	-0.1989	0.1827	-1.089	0.2767
Q7…25_fact15	-0.4031	0.1688	-2.388	0.01726
Q7…25_fact16	-0.2718	0.205	-1.326	0.1855
Q7…25_fact17	0.1637	0.2213	0.7399	0.4597
Q7…25_fact18	-0.3104	0.1788	-1.736	0.08312
Q7…25_fact19	-0.1841	0.1791	-1.027	0.3047
Q7…25_fact20	-0.2281	0.1633	-1.397	0.1631
Q7…25_fact21	-0.5285	0.2541	-2.08	0.038
Q7…25_fact22	0.05246	0.3247	0.1615	0.8717
Q7…25_fact23	-0.128	0.1676	-0.7637	0.4453
Q7…25_fact24	-0.08689	0.182	-0.4775	0.6332
Q7…25_fact25	-0.3185	0.2287	-1.393	0.1642
Q2_fact3	-0.01027	0.1474	-0.0697	0.9445
Q2_fact4	-0.0597	0.1436	-0.4157	0.6778
Q2_fact5	-0.01488	0.1434	-0.1038	0.9174
Q2_fact6	-0.02929	0.1417	-0.2067	0.8363
Q2_fact7	-0.07141	0.1425	-0.5011	0.6165
Q3_fact2	-0.05889	0.02645	-2.227	0.02637
Q3_fact4	0.2323	0.1261	1.842	0.06593
Q3_fact5	-0.2389	0.3524	-0.6779	0.4981

	Estimate	Std. Error	t value	Pr(>|t|)
Q4…22	-0.001782	0.00598	-0.298	0.7658
Q5_fact4	0.03437	0.1295	0.2655	0.7907
Q5_fact5	0.02697	0.1283	0.2102	0.8336
Q5_fact6	-0.01547	0.1323	-0.1169	0.907
Q5_fact7	-0.03012	0.1333	-0.2259	0.8213
Q5_fact8	-0.02638	0.1289	-0.2046	0.838
Q5_fact9	0.03244	0.1471	0.2205	0.8255
Q6…242	-0.07702	0.06047	-1.274	0.2033
Q58_fact1	-0.06792	0.1662	-0.4086	0.683
Q58_fact2	0.1512	0.1466	1.031	0.3029
Q58_fact3	0.04702	0.1322	0.3557	0.7222
Q58_fact4	-0.1324	0.1351	-0.98	0.3275
Q58_fact5	-0.04242	0.1244	-0.3409	0.7333
Q58_fact6	0.02395	0.1278	0.1874	0.8514
Q58_fact7	0.04507	0.126	0.3578	0.7206
Q58_fact8	-0.005745	0.1261	-0.04556	0.9637
Q58_fact9	-0.00496	0.1277	-0.03883	0.969
Q58_fact10	0.01946	0.1249	0.1558	0.8762
group_forlm_em1:Q7…25_fact2	-0.09152	0.2305	-0.3971	0.6914
group_forlm_em2:Q7…25_fact2	0.01847	0.2567	0.07193	0.9427
group_forlm_em3:Q7…25_fact2	0.05674	0.2602	0.2181	0.8275
group_forlm_em1:Q7…25_fact3	0.08917	0.2066	0.4315	0.6662
group_forlm_em2:Q7…25_fact3	0.2549	0.2145	1.188	0.2352
group_forlm_em3:Q7…25_fact3	0.3411	0.2214	1.541	0.124
group_forlm_em1:Q7…25_fact4	0.007094	0.2938	0.02414	0.9807
group_forlm_em2:Q7…25_fact4	0.3431	0.2852	1.203	0.2295
group_forlm_em3:Q7…25_fact4	0.4933	0.3018	1.634	0.1027
group_forlm_em1:Q7…25_fact5	0.1895	0.2427	0.7808	0.4352
group_forlm_em2:Q7…25_fact5	0.1998	0.2295	0.8707	0.3843
group_forlm_em3:Q7…25_fact5	-0.4509	0.2716	-1.66	0.09746
group_forlm_em1:Q7…25_fact6	0.08389	0.2514	0.3336	0.7388
group_forlm_em2:Q7…25_fact6	0.4272	0.2299	1.858	0.06366
group_forlm_em3:Q7…25_fact6	0.2358	0.2721	0.8666	0.3865
group_forlm_em1:Q7…25_fact7	0.1596	0.2096	0.7616	0.4466
group_forlm_em2:Q7…25_fact7	0.3681	0.2273	1.619	0.1059
group_forlm_em3:Q7…25_fact7	0.4679	0.2238	2.091	0.03696
group_forlm_em1:Q7…25_fact8	0.2328	0.2498	0.9318	0.3519
group_forlm_em2:Q7…25_fact8	0.4816	0.2685	1.794	0.07342
group_forlm_em3:Q7…25_fact8	0.4192	0.2367	1.771	0.07714
group_forlm_em1:Q7…25_fact9	-0.01098	0.1985	-0.05529	0.9559
group_forlm_em2:Q7…25_fact9	0.1145	0.203	0.5641	0.5729
group_forlm_em3:Q7…25_fact9	0.2955	0.2051	1.441	0.1501
group_forlm_em1:Q7…25_fact10	0.3232	0.3219	1.004	0.3158
group_forlm_em2:Q7…25_fact10	0.4457	0.2727	1.634	0.1027
group_forlm_em3:Q7…25_fact10	0.2568	0.2941	0.8731	0.383
group_forlm_em1:Q7…25_fact12	-0.2857	0.2958	-0.966	0.3345
group_forlm_em1:Q7…25_fact13	0.07959	0.207	0.3844	0.7008

	Estimate	Std. Error	t value	Pr(>|t|)
group_forlm_em2:Q7…25_fact13	0.2737	0.2142	1.278	0.2018
group_forlm_em3:Q7…25_fact13	0.2301	0.2111	1.09	0.2762
group_forlm_em1:Q7…25_fact14	-0.1049	0.2346	-0.4472	0.6549
group_forlm_em2:Q7…25_fact14	0.1927	0.2434	0.7918	0.4288
group_forlm_em3:Q7…25_fact14	0.3434	0.2431	1.413	0.1582
group_forlm_em1:Q7…25_fact15	0.235	0.2191	1.073	0.2839
group_forlm_em2:Q7…25_fact15	0.2738	0.2206	1.241	0.2151
group_forlm_em3:Q7…25_fact15	0.4201	0.2262	1.858	0.06376
group_forlm_em1:Q7…25_fact16	0.1931	0.2437	0.7926	0.4284
group_forlm_em2:Q7…25_fact16	0.3793	0.2487	1.525	0.1277
group_forlm_em3:Q7…25_fact16	0.3606	0.2599	1.388	0.1657
group_forlm_em1:Q7…25_fact17	-0.1978	0.2936	-0.6736	0.5009
group_forlm_em2:Q7…25_fact17	-0.108	0.2987	-0.3615	0.7178
group_forlm_em3:Q7…25_fact17	-0.08446	0.2804	-0.3012	0.7633
group_forlm_em1:Q7…25_fact18	0.2274	0.2255	1.009	0.3136
group_forlm_em2:Q7…25_fact18	0.3313	0.2402	1.379	0.1684
group_forlm_em3:Q7…25_fact18	0.5122	0.2506	2.044	0.04144
group_forlm_em1:Q7…25_fact19	-0.1345	0.2901	-0.4634	0.6432
group_forlm_em3:Q7…25_fact19	-0.004308	0.3573	-0.01206	0.9904
group_forlm_em1:Q7…25_fact20	-0.02361	0.2041	-0.1157	0.9079
group_forlm_em2:Q7…25_fact20	0.2195	0.2212	0.9921	0.3216
group_forlm_em3:Q7…25_fact20	0.3618	0.2231	1.622	0.1053
group_forlm_em1:Q7…25_fact21	0.6498	0.3009	2.159	0.03127
group_forlm_em2:Q7…25_fact21	0.6771	0.325	2.084	0.03765
group_forlm_em3:Q7…25_fact21	0.1116	0.4037	0.2765	0.7823
group_forlm_em1:Q7…25_fact22	-0.1182	0.3974	-0.2973	0.7663
group_forlm_em3:Q7…25_fact22	-0.02154	0.4037	-0.05335	0.9575
group_forlm_em1:Q7…25_fact23	-0.1051	0.2578	-0.4079	0.6835
group_forlm_em2:Q7…25_fact23	0.09498	0.2592	0.3664	0.7142
group_forlm_em3:Q7…25_fact23	-0.1163	0.2627	-0.4426	0.6582
group_forlm_em1:Q7…25_fact24	-0.1454	0.2391	-0.6079	0.5435
group_forlm_em2:Q7…25_fact24	0.1368	0.2565	0.5335	0.5939
group_forlm_em3:Q7…25_fact24	0.2428	0.2775	0.8752	0.3818
group_forlm_em1:Q7…25_fact25	0.03792	0.3819	0.09927	0.921
group_forlm_em2:Q7…25_fact25	0.3156	0.3257	0.969	0.333
group_forlm_em3:Q7…25_fact25	0.213	0.3091	0.6892	0.491

8. Controls for T4-T5 (explicit)

Table 23: Linear regression model 16.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	6.958	0.8226	8.458	4.593e-16

	Estimate	Std. Error	t value	Pr(>|t|)
group_forlm_rep4	-0.02601	0.08348	-0.3116	0.7555
group_forlm_rep5	-0.01475	0.09043	-0.1632	0.8705
Q2_fact3	-0.1777	0.5601	-0.3173	0.7512
Q2_fact4	0.1088	0.551	0.1975	0.8435
Q2_fact5	0.04868	0.5492	0.08864	0.9294
Q2_fact6	0.07566	0.5483	0.138	0.8903
Q2_fact7	0.007017	0.5496	0.01277	0.9898
Q3_fact2	-0.2824	0.07983	-3.538	0.0004486
Q3_fact4	-0.3817	0.6006	-0.6355	0.5255
Q4…22	0.0009932	0.01877	0.05291	0.9578
Q5_fact4	-0.03731	0.5639	-0.06617	0.9473
Q5_fact5	0.2145	0.5633	0.3808	0.7035
Q5_fact6	0.3602	0.5694	0.6326	0.5274
Q5_fact7	0.06073	0.5732	0.106	0.9157
Q5_fact8	0.2264	0.5624	0.4026	0.6875
Q5_fact9	0.2839	0.5925	0.4792	0.632
Q6…242	-0.1124	0.1811	-0.6203	0.5354
Q7…25_fact2	0.1683	0.2813	0.5982	0.55
Q7…25_fact3	0.1435	0.213	0.6739	0.5007
Q7…25_fact4	0.127	0.2877	0.4414	0.6591
Q7…25_fact5	0.2815	0.3013	0.9344	0.3506
Q7…25_fact6	0.3814	0.2701	1.412	0.1587
Q7…25_fact7	0.00191	0.2332	0.008189	0.9935
Q7…25_fact8	0.2956	0.2656	1.113	0.2664
Q7…25_fact9	0.1589	0.2017	0.7878	0.4313
Q7…25_fact10	0.3041	0.2593	1.173	0.2415
Q7…25_fact12	0.256	0.4727	0.5415	0.5885
Q7…25_fact13	0.1082	0.2106	0.5136	0.6078
Q7…25_fact14	-0.07618	0.2354	-0.3237	0.7463
Q7…25_fact15	-0.03784	0.2405	-0.1574	0.875
Q7…25_fact16	0.07946	0.2518	0.3155	0.7525
Q7…25_fact17	-0.03408	0.2867	-0.1189	0.9054
Q7…25_fact18	-0.09833	0.2537	-0.3876	0.6985
Q7…25_fact19	0.4471	0.3209	1.393	0.1643
Q7…25_fact20	0.3748	0.2176	1.722	0.08575
Q7…25_fact21	0.402	0.2829	1.421	0.156
Q7…25_fact22	0.05551	0.2777	0.1999	0.8417
Q7…25_fact23	0.01646	0.3535	0.04658	0.9629
Q7…25_fact24	0.07689	0.3444	0.2233	0.8234
Q7…25_fact25	0.1094	0.3249	0.3367	0.7365
Q58_fact1	0.03166	0.4029	0.07858	0.9374
Q58_fact2	0.4758	0.4081	1.166	0.2444
Q58_fact3	0.2825	0.3039	0.9297	0.3531
Q58_fact4	0.1909	0.3383	0.5642	0.5729
Q58_fact5	0.3898	0.2756	1.414	0.1581
Q58_fact6	0.2875	0.2897	0.9922	0.3217
Q58_fact7	0.4378	0.2772	1.579	0.115

	Estimate	Std. Error	t value	Pr(>|t|)
Q58_fact8	0.3846	0.2809	1.369	0.1717
Q58_fact9	0.5058	0.2936	1.723	0.08566
Q58_fact10	0.5164	0.2757	1.873	0.06174

9. Controls for T4-T5 (Implicit)

Table 24: Linear regression model 17.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	0.6365	0.3105	2.05	0.04099
group_forlm_rep4	0.01196	0.03151	0.3797	0.7043
group_forlm_rep5	0.0009276	0.03413	0.02718	0.9783
Q2_fact3	-0.2658	0.2114	-1.257	0.2093
Q2_fact4	-0.2616	0.2079	-1.258	0.2091
Q2_fact5	-0.2633	0.2073	-1.27	0.2046
Q2_fact6	-0.2453	0.2069	-1.185	0.2366
Q2_fact7	-0.3004	0.2074	-1.448	0.1483
Q3_fact2	-0.01626	0.03013	-0.5396	0.5898
Q3_fact4	-0.07678	0.2267	-0.3387	0.735
Q4…22	0.00322	0.007085	0.4546	0.6497
Q5_fact4	-0.4491	0.2128	-2.11	0.03543
Q5_fact5	-0.4404	0.2126	-2.071	0.03895
Q5_fact6	-0.4391	0.2149	-2.043	0.04163
Q5_fact7	-0.5559	0.2163	-2.57	0.01053
Q5_fact8	-0.5179	0.2123	-2.44	0.01509
Q5_fact9	-0.5883	0.2236	-2.631	0.008828
Q6…242	-0.05418	0.06837	-0.7925	0.4285
Q7…25_fact2	0.05353	0.1062	0.5043	0.6143
Q7…25_fact3	-0.151	0.08038	-1.879	0.06099
Q7…25_fact4	-0.08796	0.1086	-0.8102	0.4183
Q7…25_fact5	-0.1478	0.1137	-1.3	0.1942
Q7…25_fact6	-0.02167	0.1019	-0.2126	0.8317
Q7…25_fact7	-0.03464	0.08802	-0.3935	0.6942
Q7…25_fact8	-0.0799	0.1002	-0.797	0.4259
Q7…25_fact9	-0.04726	0.07611	-0.6209	0.535
Q7…25_fact10	-0.1633	0.09787	-1.668	0.096
Q7…25_fact12	0.1495	0.1784	0.838	0.4025
Q7…25_fact13	-0.0551	0.07948	-0.6932	0.4886
Q7…25_fact14	-0.1064	0.08883	-1.197	0.2319
Q7…25_fact15	-0.07729	0.09075	-0.8517	0.3949
Q7…25_fact16	-0.09199	0.09504	-0.9678	0.3337
Q7…25_fact17	-0.03892	0.1082	-0.3597	0.7193
Q7…25_fact18	-0.0289	0.09574	-0.3019	0.7629

	Estimate	Std. Error	t value	Pr(>|t|)
Q7…25_fact19	-0.1323	0.1211	-1.092	0.2753
Q7…25_fact20	-0.0563	0.08214	-0.6854	0.4935
Q7…25_fact21	-0.102	0.1068	-0.9558	0.3397
Q7…25_fact22	-0.01487	0.1048	-0.1419	0.8872
Q7…25_fact23	-0.1592	0.1334	-1.194	0.2333
Q7…25_fact24	-0.2514	0.13	-1.935	0.05373
Q7…25_fact25	0.0164	0.1226	0.1337	0.8937
Q58_fact1	0.1477	0.1521	0.9711	0.3321
Q58_fact2	-0.07514	0.154	-0.4878	0.626
Q58_fact3	0.06137	0.1147	0.535	0.5929
Q58_fact4	-0.08578	0.1277	-0.6718	0.5021
Q58_fact5	0.03834	0.104	0.3685	0.7127
Q58_fact6	0.01469	0.1093	0.1343	0.8932
Q58_fact7	0.02071	0.1046	0.198	0.8432
Q58_fact8	0.008179	0.106	0.07716	0.9385
Q58_fact9	0.03341	0.1108	0.3016	0.7631
Q58_fact10	0.019	0.1041	0.1826	0.8552

10. Interaction with age for T4-T5 (implicit)

Table 25: Linear regression model 18.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.026	0.375	2.735	0.006507
group_forlm_rep4	-0.7203	0.4124	-1.747	0.08142
group_forlm_rep5	-0.005425	0.06823	-0.0795	0.9367
Q2_fact3	-0.7244	0.3045	-2.379	0.01782
Q2_fact4	-0.5795	0.3006	-1.928	0.05454
Q2_fact5	-0.5842	0.2994	-1.951	0.0517
Q2_fact6	-0.6331	0.2962	-2.137	0.03319
Q2_fact7	-0.6847	0.2972	-2.304	0.02174
Q3_fact2	-0.01507	0.03026	-0.498	0.6187
Q3_fact4	-0.09911	0.2267	-0.4371	0.6623
Q4…22	0.003169	0.007092	0.4469	0.6552
Q5_fact4	-0.4646	0.2153	-2.158	0.03151
Q5_fact5	-0.4733	0.2152	-2.199	0.02844
Q5_fact6	-0.483	0.2179	-2.217	0.02719
Q5_fact7	-0.6139	0.2189	-2.805	0.005271
Q5_fact8	-0.5589	0.2149	-2.601	0.009642
Q5_fact9	-0.6226	0.2257	-2.759	0.006066
Q6…242	-0.06246	0.06857	-0.9109	0.3629
Q7…25_fact2	0.05243	0.1065	0.4926	0.6226
Q7…25_fact3	-0.1505	0.08031	-1.874	0.06161

	Estimate	Std. Error	t value	Pr(>|t|)
Q7...25_fact4	-0.08765	0.1092	-0.8026	0.4227
Q7...25_fact5	-0.1383	0.1141	-1.212	0.226
Q7...25_fact6	0.01297	0.1031	0.1259	0.8999
Q7...25_fact7	-0.02898	0.08802	-0.3292	0.7421
Q7...25_fact8	-0.0601	0.1003	-0.5995	0.5492
Q7...25_fact9	-0.0355	0.07613	-0.4663	0.6412
Q7...25_fact10	-0.1533	0.09797	-1.565	0.1184
Q7...25_fact12	0.164	0.1789	0.9167	0.3598
Q7...25_fact13	-0.05639	0.07958	-0.7086	0.479
Q7...25_fact14	-0.0902	0.08905	-1.013	0.3117
Q7...25_fact15	-0.07017	0.09132	-0.7683	0.4427
Q7...25_fact16	-0.0978	0.09601	-1.019	0.309
Q7...25_fact17	-0.01886	0.1084	-0.1739	0.862
Q7...25_fact18	-0.04553	0.09688	-0.4699	0.6387
Q7...25_fact19	-0.1145	0.1217	-0.9405	0.3475
Q7...25_fact20	-0.06518	0.08204	-0.7946	0.4273
Q7...25_fact21	-0.1011	0.107	-0.9448	0.3453
Q7...25_fact22	-0.007934	0.1055	-0.07523	0.9401
Q7...25_fact23	-0.1642	0.1334	-1.231	0.2189
Q7...25_fact24	-0.2324	0.1305	-1.782	0.07555
Q7...25_fact25	0.02636	0.1238	0.2129	0.8315
Q58_fact1	0.1888	0.1535	1.23	0.2194
Q58_fact2	-0.06084	0.1538	-0.3955	0.6927
Q58_fact3	0.07332	0.1155	0.6347	0.5259
Q58_fact4	-0.06821	0.1282	-0.5321	0.5949
Q58_fact5	0.0512	0.1043	0.491	0.6237
Q58_fact6	0.03866	0.1105	0.3499	0.7266
Q58_fact7	0.05136	0.1054	0.4872	0.6264
Q58_fact8	0.02989	0.1062	0.2814	0.7786
Q58_fact9	0.05725	0.1112	0.5151	0.6068
Q58_fact10	0.04291	0.1045	0.4108	0.6815
group_forlm_rep4:Q2_fact3	0.8836	0.4294	2.058	0.04027
group_forlm_rep5:Q2_fact3	0.1979	0.1662	1.191	0.2343
group_forlm_rep4:Q2_fact4	0.6557	0.4228	1.551	0.1217
group_forlm_rep5:Q2_fact4	-0.08346	0.1175	-0.7102	0.478
group_forlm_rep4:Q2_fact5	0.698	0.4177	1.671	0.09549
group_forlm_rep5:Q2_fact5	-0.09679	0.1046	-0.9249	0.3555
group_forlm_rep4:Q2_fact6	0.7211	0.4156	1.735	0.0835
group_forlm_rep5:Q2_fact6	0.07424	0.08893	0.8348	0.4043
group_forlm_rep4:Q2_fact7	0.7763	0.4174	1.86	0.06365

11. Interaction with geographical factor for T4-T5 (implicit)

Table 26: Linear regression model 19. (continued below)

	Estimate	Std. Error	t value
(Intercept)	0.3442	0.3402	1.012
group_forlm_rep4	0.2291	0.1565	1.464
group_forlm_rep5	0.1236	0.1783	0.6934
Q7…25_fact2	-0.01739	0.1788	-0.0973
Q7…25_fact3	0.07817	0.1394	0.5607
Q7…25_fact4	0.1749	0.2005	0.8724
Q7…25_fact5	-0.6003	0.1985	-3.025
Q7…25_fact6	-0.02896	0.1959	-0.1478
Q7…25_fact7	0.2048	0.1426	1.436
Q7…25_fact8	0.06708	0.1494	0.4489
Q7…25_fact9	0.08749	0.1257	0.6962
Q7…25_fact10	-0.09796	0.1801	-0.5439
Q7…25_fact12	0.1169	0.2129	0.5492
Q7…25_fact13	0.04466	0.1306	0.3421
Q7…25_fact14	0.1365	0.1536	0.8887
Q7…25_fact15	0.008959	0.1452	0.06172
Q7…25_fact16	0.06411	0.1538	0.4169
Q7…25_fact17	0.05158	0.1664	0.31
Q7…25_fact18	0.1645	0.1716	0.959
Q7…25_fact19	-0.1822	0.295	-0.6176
Q7…25_fact20	0.1104	0.1445	0.7637
Q7…25_fact21	-0.4513	0.2961	-1.524
Q7…25_fact22	0.04876	0.2256	0.2161
Q7…25_fact23	-0.2462	0.1935	-1.273
Q7…25_fact24	0.01566	0.2116	0.07401
Q7…25_fact25	0.03789	0.1987	0.1907
Q2_fact3	-0.1454	0.2232	-0.6512
Q2_fact4	-0.196	0.218	-0.8993
Q2_fact5	-0.1756	0.2176	-0.8069
Q2_fact6	-0.1893	0.2172	-0.8715
Q2_fact7	-0.2292	0.2176	-1.053
Q3_fact2	-0.006287	0.03092	-0.2033
Q3_fact4	0.07984	0.2503	0.319
Q4…22	0.003221	0.007431	0.4335
Q5_fact4	-0.303	0.2245	-1.35
Q5_fact5	-0.2923	0.2246	-1.302
Q5_fact6	-0.3151	0.2263	-1.392
Q5_fact7	-0.4226	0.2301	-1.836
Q5_fact8	-0.3592	0.2245	-1.6
Q5_fact9	-0.4167	0.236	-1.766
Q6…242	-0.04681	0.07139	-0.6558
Q58_fact1	0.04911	0.1557	0.3154
Q58_fact2	-0.2186	0.1603	-1.363
Q58_fact3	0.005182	0.1172	0.04422
Q58_fact4	-0.1677	0.1318	-1.272

81

	Estimate	Std. Error	t value
Q58_fact5	-0.01772	0.1068	-0.1659
Q58_fact6	-0.04449	0.112	-0.3973
Q58_fact7	-0.01161	0.107	-0.1086
Q58_fact8	-0.0473	0.1097	-0.4313
Q58_fact9	-0.02305	0.1136	-0.203
Q58_fact10	-0.03641	0.1066	-0.3415
group_forlm_rep4:Q7…25_fact2	0.007955	0.2424	0.03281
group_forlm_rep5:Q7…25_fact2	0.2276	0.2766	0.8226
group_forlm_rep4:Q7…25_fact3	-0.3446	0.1942	-1.775
group_forlm_rep5:Q7…25_fact3	-0.2987	0.2072	-1.442
group_forlm_rep4:Q7…25_fact4	-0.4893	0.2612	-1.873
group_forlm_rep5:Q7…25_fact4	-0.1953	0.291	-0.6711
group_forlm_rep4:Q7…25_fact5	0.6699	0.2632	2.546
group_forlm_rep5:Q7…25_fact5	0.5897	0.2884	2.044
group_forlm_rep4:Q7…25_fact6	-0.03622	0.2495	-0.1452
group_forlm_rep5:Q7…25_fact6	-0.01726	0.2699	-0.06395
group_forlm_rep4:Q7…25_fact7	-0.4408	0.2049	-2.152
group_forlm_rep5:Q7…25_fact7	-0.3264	0.2254	-1.448
group_forlm_rep4:Q7…25_fact8	-0.1407	0.27	-0.5209
group_forlm_rep5:Q7…25_fact8	-0.2592	0.2393	-1.083
group_forlm_rep4:Q7…25_fact9	-0.2483	0.1751	-1.418
group_forlm_rep5:Q7…25_fact9	-0.1509	0.1995	-0.7565
group_forlm_rep4:Q7…25_fact10	-0.1161	0.2311	-0.5024
group_forlm_rep5:Q7…25_fact10	-0.09874	0.2639	-0.3742
group_forlm_rep4:Q7…25_fact13	-0.2545	0.181	-1.406
group_forlm_rep5:Q7…25_fact13	0.0008232	0.2086	0.003947
group_forlm_rep4:Q7…25_fact14	-0.2544	0.212	-1.2
group_forlm_rep5:Q7…25_fact14	-0.4118	0.2252	-1.829
group_forlm_rep4:Q7…25_fact15	-0.2176	0.2038	-1.068
group_forlm_rep5:Q7…25_fact15	-7.918e-06	0.2462	-3.216e-05
group_forlm_rep4:Q7…25_fact16	-0.2577	0.2223	-1.159
group_forlm_rep5:Q7…25_fact16	-0.2482	0.2403	-1.033
group_forlm_rep4:Q7…25_fact17	-0.1865	0.2336	-0.7983
group_forlm_rep5:Q7…25_fact17	-0.1385	0.3508	-0.3949
group_forlm_rep4:Q7…25_fact18	-0.3276	0.2205	-1.486
group_forlm_rep5:Q7…25_fact18	-0.2055	0.2713	-0.7575
group_forlm_rep4:Q7…25_fact19	-0.05523	0.3419	-0.1615
group_forlm_rep5:Q7…25_fact19	0.1013	0.3654	0.2772
group_forlm_rep4:Q7…25_fact20	-0.3598	0.1927	-1.868
group_forlm_rep5:Q7…25_fact20	-0.05279	0.2168	-0.2435
group_forlm_rep4:Q7…25_fact21	0.3092	0.3341	0.9257
group_forlm_rep5:Q7…25_fact21	0.3683	0.3544	1.039
group_forlm_rep4:Q7…25_fact22	-0.139	0.2768	-0.5023
group_forlm_rep5:Q7…25_fact22	-0.08239	0.2869	-0.2872
group_forlm_rep4:Q7…25_fact23	0.1366	0.2955	0.4622
group_forlm_rep5:Q7…25_fact23	0.4589	0.3668	1.251
group_forlm_rep4:Q7…25_fact24	-0.614	0.3351	-1.833

	Estimate	Std. Error	t value
group_forlm_rep5:Q7…25_fact24	-0.3278	0.2938	-1.116
group_forlm_rep4:Q7…25_fact25	0.01229	0.3044	0.04039
group_forlm_rep5:Q7…25_fact25	-0.01329	0.2889	-0.04601

	Pr(>|t|)
(Intercept)	0.3124
group_forlm_rep4	0.144
group_forlm_rep5	0.4885
Q7…25_fact2	0.9225
Q7…25_fact3	0.5753
Q7…25_fact4	0.3835
Q7…25_fact5	0.00266
Q7…25_fact6	0.8826
Q7…25_fact7	0.1518
Q7…25_fact8	0.6538
Q7…25_fact9	0.4867
Q7…25_fact10	0.5868
Q7…25_fact12	0.5832
Q7…25_fact13	0.7325
Q7…25_fact14	0.3748
Q7…25_fact15	0.9508
Q7…25_fact16	0.677
Q7…25_fact17	0.7567
Q7…25_fact18	0.3382
Q7…25_fact19	0.5372
Q7…25_fact20	0.4455
Q7…25_fact21	0.1283
Q7…25_fact22	0.829
Q7…25_fact23	0.2039
Q7…25_fact24	0.941
Q7…25_fact25	0.8488
Q2_fact3	0.5153
Q2_fact4	0.3691
Q2_fact5	0.4202
Q2_fact6	0.384
Q2_fact7	0.2929
Q3_fact2	0.839
Q3_fact4	0.7499
Q4…22	0.6649
Q5_fact4	0.178
Q5_fact5	0.1938
Q5_fact6	0.1646
Q5_fact7	0.0671
Q5_fact8	0.1103
Q5_fact9	0.07828

	Pr(>|t|)
Q6…242	0.5124
Q58_fact1	0.7526
Q58_fact2	0.1736
Q58_fact3	0.9648
Q58_fact4	0.2041
Q58_fact5	0.8684
Q58_fact6	0.6914
Q58_fact7	0.9136
Q58_fact8	0.6665
Q58_fact9	0.8393
Q58_fact10	0.7329
group_forlm_rep4:Q7…25_fact2	0.9738
group_forlm_rep5:Q7…25_fact2	0.4113
group_forlm_rep4:Q7…25_fact3	0.0767
group_forlm_rep5:Q7…25_fact3	0.1502
group_forlm_rep4:Q7…25_fact4	0.0618
group_forlm_rep5:Q7…25_fact4	0.5026
group_forlm_rep4:Q7…25_fact5	0.0113
group_forlm_rep5:Q7…25_fact5	0.04163
group_forlm_rep4:Q7…25_fact6	0.8846
group_forlm_rep5:Q7…25_fact6	0.949
group_forlm_rep4:Q7…25_fact7	0.03207
group_forlm_rep5:Q7…25_fact7	0.1485
group_forlm_rep4:Q7…25_fact8	0.6027
group_forlm_rep5:Q7…25_fact8	0.2794
group_forlm_rep4:Q7…25_fact9	0.157
group_forlm_rep5:Q7…25_fact9	0.4499
group_forlm_rep4:Q7…25_fact10	0.6157
group_forlm_rep5:Q7…25_fact10	0.7085
group_forlm_rep4:Q7…25_fact13	0.1605
group_forlm_rep5:Q7…25_fact13	0.9969
group_forlm_rep4:Q7…25_fact14	0.2308
group_forlm_rep5:Q7…25_fact14	0.06827
group_forlm_rep4:Q7…25_fact15	0.2864
group_forlm_rep5:Q7…25_fact15	1
group_forlm_rep4:Q7…25_fact16	0.2471
group_forlm_rep5:Q7…25_fact16	0.3025
group_forlm_rep4:Q7…25_fact17	0.4252
group_forlm_rep5:Q7…25_fact17	0.6932
group_forlm_rep4:Q7…25_fact18	0.1382
group_forlm_rep5:Q7…25_fact18	0.4492
group_forlm_rep4:Q7…25_fact19	0.8718
group_forlm_rep5:Q7…25_fact19	0.7818
group_forlm_rep4:Q7…25_fact20	0.06259
group_forlm_rep5:Q7…25_fact20	0.8078
group_forlm_rep4:Q7…25_fact21	0.3552
group_forlm_rep5:Q7…25_fact21	0.2994

84

	Pr(>|t|)
group_forlm_rep4:Q7…25_fact22	0.6157
group_forlm_rep5:Q7…25_fact22	0.7741
group_forlm_rep4:Q7…25_fact23	0.6442
group_forlm_rep5:Q7…25_fact23	0.2117
group_forlm_rep4:Q7…25_fact24	0.06767
group_forlm_rep5:Q7…25_fact24	0.2653
group_forlm_rep4:Q7…25_fact25	0.9678
group_forlm_rep5:Q7…25_fact25	0.9633

10 Appendix B.

10.1 Information about the data scraped for Telegram analysis

Channel	Posts scraped	Post left after subsetting
Unian	56215	1146
ukOnline	34655	273
Truha	44556	881
RealV	40868	330
TCH	71130	802

11 Appendix C.

11.1 Advertisement in Facebook

1. This is the logo created in Canva

2. This is the text that was located under the picture with advertisement:

This page was created to publish a survey on social changes in Ukraine in 2023. Its results will be used to write the master's thesis of a student at the Central European University in Vienna, Austria (Central European University). This survey includes 4 blocks of questions and should take approximately 20 minutes. If you complete this survey, you have the opportunity to participate in a raffle with three cash prizes: €100, €50 and €50.

All other materials that were produced and executed during this research can be found in the supplementary materials to this paper.