

# Shamed to Death: Social Image Concerns and War Participation\*

Anna Becker<sup>†</sup>

May 25, 2022

**Preliminary Draft**

[Please click here for the latest version.](#)

## **Abstract**

Can social image concerns cause people to take costly actions benefiting their community? Using newly collected data, I study the impact of public shaming on voluntary recruitment during World War I in England and Wales. At the time, young women in many towns and cities handed out white feathers to men in civilian clothes, marking them out as cowards. This was intended to encourage volunteering. I reconstruct a panel of “White Feather Girls” activity from local newspaper articles and exploit the staggered spread of the movement in an event study framework. Following episodes of public shaming, recruitment increased significantly: Volunteering surged by a third during the 10 days after the first mention of the White Feather Girls in the news. Confounding factors such as reporting of wartime events are unlikely to account for these patterns. These results suggest that public image concerns can have first-order effects on costly altruistic behavior that benefits the group.

**Keywords:** Social Image Concerns, Public Shaming, World War I

---

\*I thank seminar audiences at UCL and the University of Zurich for comments and suggestions, and especially Steffen Huck and Attila Lindner for helpful advice. Bruno Caprettini and Hans-Joachim Voth provided detailed feedback and shared some of their data.

<sup>†</sup>University College London, Department of Economics, Drayton House, 30 Gordon St, London WC1H 0AX, United Kingdom. E-mail: [anna.becker.14@ucl.ac.uk](mailto:anna.becker.14@ucl.ac.uk)

# 1 Introduction

Most people care about what others think of them. In his *Theory of Moral Sentiments*, Adam Smith already argued that our ideas of both right and wrong as well as our actions reflect our nature as social beings. Recent theoretical work by Bénabou and Tirole (2006) emphasizes the importance of public perceptions, motivating people to engage in “honorific” actions. That social image concerns can shape decisions from education and voting to charitable giving has also been demonstrated empirically in several recent studies (Bursztyn, Egorov, and Jensen 2019; DellaVigna, List, and Malmendier 2012; Gerber, Green, and Larimer 2008). However, the stakes in most of these studies are relatively low. While it seems abundantly clear that people care about their image to some extent, it is an open question *how much* they care and whether such concerns can help to sustain large-scale cooperation in human societies (Gintis 2000; Grimalda, Pondorfer, and Tracer 2016).<sup>1</sup> Are social image concerns mostly minor, and only of empirical consequence in low-stakes settings, or are people willing to take major risks to preserve and enhance their public standing?

In this paper, I use newly-collected data from Britain during World War I to show that public shaming can lead to a particularly risky decision – volunteering for wartime service. Britain had an all-volunteer army until 1916, with 2.5 million men joining. As part of the recruitment effort, young women would approach men not wearing a uniform in the streets and present them with a white feather, a symbol of cowardice, in an attempt to make them join the Army (e.g. Gullace 2002). Using detailed newspaper reports on the activities of the “White Feather Brigade” and highly granular data on local military recruitment, I show in a difference-in-difference analysis that public shaming led to big increases in volunteering. These findings strongly suggest that social image concerns induced by the actions of complete strangers can lead to highly costly, altruistic behavior in a real-world setting.

The White Feather Girls, an informal movement of young women, emerged soon after the

---

1. Ager et al. (Forthcoming) argue that **personal rivalry** can induce risky actions. While also a form of public image concern, their setting is specific to closely knit groups of peers.

outbreak of World War I. The movement spread across the country and white feathers were handed out in all parts of the UK. There are no official records on the activity of the movement and no precise information on the number of members or incidents. Contemporary witnesses argue that the “idea [of the white feather] spread like a virulent disease” and that receiving a white feather caused “pain and acute embarrassment”.<sup>2</sup> Because many men followed the call of the White Feather, several companies in war-relevant industries gave out badges to their employees, seeking to protect them from the shame of receiving a feather.<sup>3</sup> I compile the first comprehensive panel on the daily activities of the White Feather Girls, using newspaper records. I combine these data with newly-digitized historical records on daily recruitment in 121 cities in England and Wales during the first months of World War I, August 1914 to May 1915.

I examine the effect of the White Feather Girls on recruitment by exploiting the staggered reporting on the movement across cities, using an event-study design. In order to meet recent concerns regarding the standard implementation of event study designs using ordinary least squares, the approach is implemented using the imputation strategy proposed by Borusyak, Jaravel, and Spiess (2021). For each recruiting city, I look at the effect of the *first* mention as the point in time when the movement initially reached a city. I find a significant effect on volunteering in the ten days after a mention of the White Feather Brigade in the local newspapers. The effect is of considerable size. Volunteering is on average 36.6%<sup>4</sup> higher in the 10 days following the first mention of the White Feathers. The effect is not reversed in the subsequent weeks, i.e. it does not turn negative after the positive effect following treatment. This suggests that the White Feather Girls increased the total number of volunteers rather than making those who would have enlisted anyway bring their decision forward.

---

2. IWM letter. Imperial War Museum staff, “Great War Index to Letters of Interest,” n.d., Imperial War Museum, London.

3. See also Gullace (2002) for more details on the introduction of badges to protect workers. Figure C.4, Panel (b), in the Appendix shows a newspaper article discussing the practice for workers from the R.A.F. (Royal Aircraft Factory) in December 1914. Figure B.3 in the Appendix shows how the idea to introduce badges was discussed in the House of Commons in March 1915.

4. The standard error of this estimate is 0.135.

A key assumption in such a difference-in-differences style estimation is that in the absence of the reporting about the White Feather movement recruitment would have evolved in the same way in treated and untreated cities. I test the credibility of this assumption by showing that there are no significant deviations between the treated and the control cities prior to treatment – suggesting that the parallel trends assumption is satisfied. This suggests that the spread of the White Feather Movement was not a response to local volunteering trends. I can furthermore show that the results are robust to the inclusion of several important controls. First, I control for the daily number of casualties in each recruiting city. Second, I control for regional differences that might have influenced the decision to enlist in the Army, such as the share of self-employed and the share of those in paid employment as well as the share of females. The results remain largely unchanged. Including demographic controls, average recruiting is increased by 45%<sup>5</sup> in the ten days after activity of the White Feather Girls in comparison to average recruitment in the ten days before.

I also control for region-specific time-varying news coverage as a potential confound. For instance, the mention of the White Feather movement in the local newspaper might coincide with differences in war reporting. To deal with this concern I apply textual analysis to a large corpus of 250,000 randomly selected articles covering the time period studied. I compute two measures for news coverage. First, I apply the Latent Dirichlet Allocation (LDA) to train a topic model on five topics. In addition, I compute a measure for negative sentiment using a lexicon that provides information on the emotional annotation of words. I compute the share of all articles in the vicinity of each recruiting city that refer to the different topics determined by the LDA as well as a measure for negative news sentiment. The inclusion of both of these controls does not alter the results. The overall effect on recruiting is still statistically significant and slightly higher than in the base specification.

Finally, I also show that the results are robust to alternative implementations of the event study. In particular, I show that excluding cities that were treated considerably later than

---

5. The standard error of this estimate is 0.1415.

the majority does not change the results. Lastly, I also re-estimate the results using the Generalized Synthetic Control Approach (Xu 2017) which allows me to relax the assumption of parallel trends but find results similar to the difference-in-differences approach.

The White Feather Girls anticipated that they would hit a nerve with young men in early 20th century Britain. But why was this shaming strategy so successful? As shown by Fehr and Gächter (2000) altruistic punishment can increase levels of cooperation in the public goods game. Individuals are willing to punish defectors even if this yields no personal benefits and is costly for themselves (Fehr and Gächter 2002; Fehr, Gächter, and Kirchsteiger 1997). Giving out white feathers to punish young men not yet enlisted was indeed a costly action for these women. The public did not approve of the method deeming it not seemly and the girls also had to fear immediate retaliation by resentful men. These would often react violently to the receipt of a feather. Fehr and Gächter (2002) argue that negative emotions towards the defectors can explain why individuals are willing to pay a personal cost. Bowles and Gintis (2005) and also Gintis (2004), on the other hand, discuss the reactions of the defectors who receive the punishment. They present evidence suggesting that punishment functions as a signal of social disapproval which evokes emotions of shame in the defectors and which they seek to avoid by cooperating. By signaling their disapproval the White Feather Girls diverted the young men's focus away from the pride associated with joining the army to the shame of not serving their country.

War participation is strongly linked to traditional norms of masculinity. The narrative of the male war hero fighting for the country, receiving female adoration in return, is arguably as old as storytelling itself. Evolutionary psychologists believe that the greater variance in terms of reproductive success among men as compared to women has enhanced intra-sexual competition in men and can explain differences in physical aggressiveness between the sexes (Vugt, Cremer, and Janssen 2007). At the same time, men have incentives to form coalitions. In such a setting, a combination of intra-group cooperation and inter-group aggression, also

known as “parochial altruism”, may be an adaptive trait.<sup>6</sup> A potential explanation for the success of the White Feather Girls is therefore that they took advantage of men’s primal instincts (Hart 2010).<sup>7</sup> In this sense, this study can be thought of as “existence result”, offering empirical support for anthropological theories arguing that males signal their fitness through war participation, and are perceived as sexually more attractive by females when they return as war heroes (Rusch, Leunissen, and van Vugt 2015).

This paper makes several contributions to the existing literature. First, I exploit a unique natural experiment to show that individuals care about their social image even when the stakes are extremely high. Previous research has shown that social image concerns can shape our behavior in many areas of life. These include for example education (Bursztyn and Jensen 2015; Bursztyn, Egorov, and Jensen 2019), career choices (Bursztyn, Fujiwara, and Pallais 2017), and credit card take-up (Bursztyn et al. 2017).<sup>8</sup> In these settings, however, the outcomes considered are typically relatively low cost. Here, I show that people would go as far as putting their lives on the line to maintain a positive social image and can thus demonstrate the power of social image concerns.

Second, this study provides important new insights on the functionality of social image concerns. The observation that people are willing to pay an extremely high personal cost raises questions about why humans have evolved to put so much weight on others’ opinions – Adam Smith’s question in the *Theory of Moral Sentiments*. Previous studies have shown that individuals are willing to take costly actions for the benefit of the group when they care about their relative standing among their peers. Ager et al. (Forthcoming), for example, study the behavior of German fighter pilots during WWII and find that pilots are more successful, but also run a greater risk of death, when a former peer received an honorable mention. Cantoni et al. (2019), Bursztyn et al. (2021) and Enikolopov, Makarin, and Petrova (2020) show that

---

6. See e.g. Choi and Bowles (2007) and Bowles (2009).

7. In *The Mystery of Courage*, Miller (2002) argues: “With courage comes embedded a theory of manhood. In a significant number of cultures, as chastity was to women, so courage was to men: the virtue at the center of their gendered identity.”

8. For an overview see also Bursztyn and Jensen (2017).

protest participation in Hong Kong and Russia is affected by the behavior of friends and other peers. There currently is no observational evidence suggesting that social image concerns can foster pro-social behavior outside tightly-knit small groups. Results from both laboratory (e.g. Gächter and Fehr 1999; Grimalda, Pondorfer, and Tracer 2016) and field experiments (Gerber, Green, and Larimer 2008; Dellavigna et al. 2016; DellaVigna, List, and Malmendier 2012) suggest a relationship between social image concerns and altruistic behavior between strangers. The external validity of this existing evidence can be questioned because stakes are often low. This paper analyzes a unique real-world setting with high stakes to show that public image concerns can be important even in front of total strangers, leading to risky, altruistic actions.

The rest of this paper is structured as follows. In the next section, I will provide an overview over the historical background of WWI in the United Kingdom, the recruiting efforts and the White Feather movement. I will also introduce the data and the possibilities it provides for the analyzes as well as the limitations it sets. In Section 3, I introduce the empirical approach in detail and discuss the main findings as well as their robustness. Section 4 concludes.

## 2 Historical Background and Data

On the 4th of August, 1914 the UK declared war on Germany. It did so after Germany violated Belgian neutrality. At the outbreak of the war, the British Army was composed of 250,000 regulars. Half of them were serving overseas, and the Royal Navy absorbed much of the country's defense spending. The Army was much smaller than that of many other European countries. The French Army, for example, counted 1.3 million soldiers at the time, the German Army entered the war with a total strength of 1.9 million. Britain also exclusively relied on professional soldiers at the time. Conscription was only introduced in 1916. During the initial months of World War I, the United Kingdom therefore stepped up its efforts to recruit volunteers.

The Secretary of State for War, Herbert Kitchener, called for 200,000 volunteers in the first month of the war. The response was overwhelming: his call to arms was answered by around 250,000 volunteers in August and almost 400,000 in September. Figure 1 shows the number of volunteers per month from the beginning of the war until the introduction of conscription in January 1916. In the initial months, 2.5 million men enlisted voluntarily in the army; many of these joined during the first eight weeks of the war. As casualties mounted, the number of volunteers began to decline (see Figure 1, right axis). Nonetheless, “Kitchener’s Army” consistently attracted around 100,000 volunteers each month between October 1914 and November 1915.

[Figure 1 about here.]

## 2.1 Why did British men enlist?

Why did British men volunteer in such large numbers? For many years, the idea that a wave of “war enthusiasm” swept the country following the declaration of war was common. It has more recently been questioned by historians (see e.g. Gregory 2008; Ferguson 1998). Whether the British public really thought that “the war would be over by Christmas” is equally doubtful. Hallifax (2010) identifies the huge amounts of money given to distress relief funds as one of several indicators suggesting that a rather long and destructive war was widely anticipated.

If it was not generalized nationalist feelings or false beliefs about the risks of joining the war, what can explain the large recruiting numbers? Ferguson (1998) suggests five motives. First, the efforts of the Parliamentary Recruiting Office (PCR), using all the tools of modern propaganda, might have had the intended effect on recruitment numbers. However, this cannot explain the surge in numbers right after the start of the war as the office only became operational from September onwards. Second, Ferguson highlights the importance of peer pressure. So-called “Pals” Battalions are considered important in getting friends and neighbors to join the army. The first of those, however, was also only founded in



late August. Third, economic reasons and pressure from employers might have drawn men in. Some companies guaranteed jobs and pensions for volunteers. This may have boosted recruitment. However, Dewey (1984) shows that low wages are, if anything, negatively related to enlistment. Ferguson further highlights impulse as a potential driver. He cites Offer (1995) who suggests that a number of new recruits decided to join the war due to myopic preferences, perceiving the train ride to the depot as a substitute for holidays.

Finally, Ferguson suggests that female pressure may have been important for the high recruiting numbers. Women were involved in the war effort in a variety of ways (Ward 2001), from fund-raising to volunteering as nurses. The decision whether or not to enlist increasingly became a matter of honor. Who would be better suited to put male self-esteem to the test than the opposite sex? The government later instrumentalized public image concerns in front of women to push men into the armed forces. Official recruiting posters proclaimed “Women of Britain say - GO!”, or had the “women of London” ask: “Is your best boy wearing khaki? ...if your young man neglects his duty to King and Country, the time may come when he will neglect you.”<sup>910</sup>

The original idea to use female pressure as a means to increase recruitment numbers, however, was introduced by Admiral Fitzgerald only weeks after the start of the war. It turned into a movement that spread quickly throughout the country.

## 2.2 The White Feather Girls

The White Feather movement was launched on August 30, 1914 when Admiral Charles Penrose Fitzgerald mounted the bandstand at Folkstone. Not satisfied with the recruitment efforts at the time and a convinced conscriptionist himself, he recruited about thirty women to hand out white feathers to mostly young men not wearing a uniform (for a detailed discussion of the phenomenon see e.g. Kilday and Nash (2017), Gullace (1997), and Gullace

---

9. See Stevens (2016).

10. The latter poster can be found at: <https://www.iwm.org.uk/collections/item/object/28305>, accessed 31st of October, 2021.

(2002)).

In England, the white feather has been a symbol of cowardice since the late eighteenth century. The association is most likely related to cockfighting as cockerels with white feathers in their tails were considered a crossbreed inferior to pure-bred game cocks who do not exhibit such. In the 1902 novel “The Four Feathers” by A.E.W. Mason, a young military officer resigns from the army. Three of his comrades thereupon send white feathers to him. His fiancé also ends the engagement after confronting him with his cowardice, breaks a white feather from her fan, and hands him a fourth feather. Chastised, he returns to the army, fights in Sudan, and becomes a hero saving his unit from destruction. Thereupon, his fiancé takes him back.

The white feathers that Admiral Fitzgerald exhorted his followers to hand out were intended to do the same as Mason’s fictitious feathers – to shame young men and humiliate them publicly, in front of females. Numerous women responded to his call and many more women all over the country imitated the original campaign in Folkstone. The movement, often referred to as the “White Feather Brigade” or “The Order of the White Feather”, continued to exist long after conscription was introduced in 1916.

In **March 1915**, the practice was discussed for the first time in Parliament as concerns over the safety of non-military personnel were raised.<sup>11</sup> While no decision was reached at the time, the suggestion to distribute badges to individuals signaling that they are employed in industries of “national importance” and relevant for the war was later widely adopted to protect men not in uniform from being publicly shamed with a white feather. Men in civilian occupations would also receive letters and postcards with feathers, threatening them with making their “cowardice” public. The movement spread throughout the Empire (Stevens 2016).

There is no written evidence of how the movement was organized or how many members it counted. Nevertheless, its magnitude and effect must have been significant. A collection

---

11. See Figure B.3 in Appendix for a transcription of the discussion in the House of Commons.

of letters archived at the Imperial War Museum in London bears witness to the campaign's impact. In 1964, the BBC issued a call in the national newspapers for "cowards" to step forward. They were looking for men who received a white feather as a symbol of cowardice in WWI as part of their research for a documentary about the Great War. More than 150 men replied with a letter to the BBC, sharing their memories fifty years after the war. The letters clearly show that a white feather did not leave the recipient cold. Instead, the men report how they reacted with great anguish and at times violence towards the White Feather Girls. Some men explicitly stated that receiving a white feather convinced them to go to the recruiting office the next day. Others provided detailed accounts of what prevented them from joining the army to explain why the white feather was unjustified in their case. There can be no doubt that the threat of receiving such a symbol of cowardice weighted heavily on the minds of some young men at the time:<sup>12</sup>

Any young man who was not in Service uniform got a very cold shoulder from the women folk. Songs like "I don't want to lose you, but we think you ought to go" ... were rendered by women vocalists throughout the land... someone got the idea of the White Feather ... The idea spread like a virulent disease... But thank goodness, that tragic emblem of cowardice, the horrible white feather, never came my way.

What is unclear is whether these recruiting efforts through public shaming had any effect. The same man quoted above said in his letter to the BBC that "it is doubtful if it [the white feather campaign] ever gained a recruit". Some historians have shared this skepticism. Robb (2014) considers the White Feather Girls "a minor patriotic outburst in the early months of the war", and argues that it failed because such public action was considered "too unlady-like". The movement was also criticized at the time for harassing men and increasing cleavages in society. The famous playwright George Bernard Shaw publicly criticized the white feather girls as early as September 1914. In order to accurately assess the impact of the

---

12. From the letter from the BBC collection.

white feather girls, we require quantitative data on their activities at high frequency.

### **2.3 Quantifying the White Feather Movement: News from Home and from the Front**

Since the White Feather Girls were not a centrally organized movement, there are no official records of members and campaigns. While there are recollections of individuals and diary entries providing details of specific events, we have no complete list of the dates, places or number of incidents. However, news of the White Feather Girls and their activities spread quickly throughout the United Kingdom. Local and regional newspapers reported their activities. They tracked incidents not only at the beginning, when the first feathers were handed out, but also during later months of the war as Figure 2 shows. The movement was discussed in letters to the editor and in various comment sections. Cartoons were published ridiculing the women involved in the movement and entire pages were dedicated to discussions of whether a decent woman would engage in such behavior. Other reports on the movement were more positive (see e.g. the newspaper article shown in Figure C.4 in the Appendix). In total, I found 597 articles which cover the White Feather Movement between August 1914 and May 1915, the time period this study covers. About one third of the articles were published in September 1914, right after the movement was initiated in Folkstone. Afterwards, around 50 articles were published each month.

[Figure 2 about here.]

During the war, newspapers were the main source of information. The first radio station started broadcasting only after the war. The local and regional papers played a special role as they provided a form of contact with the loved ones at the front. In the early years of the war, extracts from letters home from soldiers at the front were published in the local papers. In addition, the local papers provided detailed accounts of the number of casualties and were therefore highly anticipated by the local population and read with great care.

## 2.4 Data on Recruitment and White Feathers

To analyze the effect the White Feather Girls had on recruiting in England and Wales at the beginning of WWI, this study draws mainly on two data sources. First, I use data on daily recruitment in 121 recruiting cities in England and Wales. The data was digitized from original recruitment records kept at the National Archives (Kew).<sup>13</sup> <sup>14</sup> The daily data covers voluntary recruitment between August 1914 and May 1915.

As there is no official account on the number of White Feather incidents, I use information from local newspapers. For that purpose, I extracted all relevant articles in the British Newspaper Archive (BNA). The British Newspaper Archive works in partnership with the British Library to digitize their large collection of local and regional newspapers. All articles found relating to the White Feathers were carefully read and checked for relevance. The articles were then located using the publishing place of the newspaper. In total, the BNA has digitized articles from 253 local newspapers in England and Wales for the time. Out of these 253 newspapers, 181 have published one or more articles on the White Feather movement. The left panel of Figure 3 shows the locations of newspapers that reported on the activities of White Feather Girls.<sup>15</sup> The right panel shows the aggregate recruiting numbers in the 121 recruiting cities in England and Wales for which daily data is available. The number of volunteers is normalized by the number of available recruits in the different cities. This information is obtained from the national census of 1911. The information is available at the level of parishes. To create a meaningful reference for the different recruiting cities, each parish in the data was aggregated according to its closest recruiting city.

[Figure 3 about here.]

To control for general sentiment in the news I also use a representative sample of articles

---

13. An example for an original statistical table from the archives can be found in Figure A.2 in the Appendix.

14. While the data do not cover all volunteers who signed up in England and Wales at the time it follows the same trend as overall recruiting numbers (see Figure A.1 in the Appendix).

15. Figure C.5 in the Appendix shows in addition which newspapers publish articles on the White Feather Girls and where most articles on White Feather Girls are published.

from the British Newspaper Archives. The articles were randomly chosen from the available newspapers taking the **periodicity of newspapers into account and ensuring that a similar number of articles was sampled for each week** covered by the available recruitment data. The text of the scanned newspaper articles has been digitized using optical character recognition (OCR) by the BNA and is therefore available in a machine-readable format. This allows me to create a data set combining the place and date of publication with the text of each article.

## 3 Empirical Strategy and Results

### 3.1 Treatment Assignment

To show the effect of the White Feather Movement on recruitment in England and Wales I make use of a difference-in-differences design with staggered adoption of treatment, exploiting both the regional variation in the publication of White Feather articles and the variation over time.

Using daily data, I look at a high-frequency outcome for recruitment. I assign treatment in a way that allows me to study the most immediate effect of articles covering the White Feather Movement on volunteering to fight. This assignment represents the most conservative way of assigning articles to recruiting cities, in the absence of circulation information for local newspapers.

[Figure 4 about here.]

Figure 4 shows the locations of newspapers and the locations of recruiting cities in the left panel. Since there is no information on either the circulation or on the area of distribution for the newspapers, I assign each article published on the White Feather to the *closest* recruiting city. The idea is that a man reading about the White Feather Girls would go to the nearest recruiting city in the data set to join the Army. A city is then considered treated when the

first White Feather article has been published. Untreated or control cities are hence those cities that have never been closest to any newspaper location publishing an article on the White Feathers.

[Table 1 about here.]

The right panel of Figure 4 shows the resulting pattern of treated and control cities for the sample. In total, there are 67 cities that receive treatment whereas the remaining 54 cities remain in the control group (never-treated). The majority of cities received treatment in the first half of September 1914, with only 10 cities subsequently being treated. Table 1 shows that the treated and control cities are strongly balanced in terms of observable characteristics. The difference in the share of females is significant on the 10% level but smaller than 0.2% of the mean in the control group. The difference in the share of people employed as “crafts and related trades workers” is significant but small in magnitude, too.

Apart from the regional variation in exposure to news about the White Feather Girls, the empirical strategy also exploits the staggered publication of these articles. As Figure 5 below shows, the majority of cities were treated right when the movement began, i.e. in the first half of September 1914. Only four cities received treatment according to the definition applied here in 1915.

[Figure 5 about here.]

### 3.2 Estimation Approach

To identify the causal effect of the White Feather movement on volunteering at the beginning of WWI, I rely on a difference-in-differences approach. This approach looks at the effect on the first days after initial treatment separately. More specifically, I assume that the outcome of interest, the volunteering share  $V_{it}$ , can be described by the following equation:

$$V_{it} = \alpha_i + \alpha_t + \tau_{it}D_{it} + \varepsilon_{i,t}. \quad (1)$$

The volunteering share  $V_{it}$  is defined as the daily number of recruits in city  $i$  at day  $t$  divided by the number of eligible men in and around a recruiting city. The number of recruits has been digitized from archival data as described in Section 2.4 and the number of eligible men has been calculated from 1911 census data. Eligible men comprise all non-disabled native-born men who are at least 13 and at most 50 years old. Census data is available at the level of parishes. To obtain relevant numbers for the recruiting cities in the data, every parish has been assigned to the nearest recruiting city. The volunteering share  $V_{it}$  is defined in percent.

In the equation above,  $\alpha_i$  describes city fixed effects,  $\alpha_t$  captures time fixed effects.  $D_{it}$  indicates treatment with  $D_{it} = 1[t \geq E_i]$  where  $E_i$  is the day when a city receives treatment and  $\varepsilon_{i,t}$  is the error term with  $E[\varepsilon_{i,t} | \alpha_i, \alpha_t, D_{it}] = 0$ . We are interested in the treatment effect  $\tau_{it}$  which captures the impact of initial reporting on the White Feathers on volunteering. The approach assumes parallel trends, i.e. that treated and untreated cities would have followed the same volunteering trend in the absence of treatment.

In a conventional approach, the above would be estimated using an event-study design in which the outcome is regressed on time and unit fixed effects as well as both leads and lags of the treatment using ordinary least squares. As recently shown by Chaisemartin and D’Haultfoeuille (2020), Goodman-Bacon (2021) and Strezhnev (2018), however, the estimands of such an approach are not reliable and do not provide the causal effects of interest even under random assignment of treatment.<sup>16</sup> The bias is driven by comparisons of earlier-treated with later-treated units when there are heterogeneous treatment effects.<sup>17</sup> In the setting considered here, a bias could for example arise if individuals treated later have a better understanding regarding the risks of participating in the war, e.g. by observing the outcome of large battles. This study therefore uses an imputation estimator which takes the bias into account.

---

16. See also Sun and Abraham (Forthcoming), Callaway and Sant’Anna (2020), Imai and Kim (2021), Borusyak and Jaravel (2017) and Athey and Imbens (2018).

17. See Baker, Larcker, and Wang (2021), for a survey of the literature.



Several robust estimators have been proposed to deal with this bias (see for example Chaisemartin and D’Haultfoeuille (2020), Sun and Abraham (Forthcoming) and Callaway and Sant’Anna (2020))<sup>18</sup>. This study makes use of the imputation estimator as proposed by Borusyak, Jaravel, and Spiess (2021). Their estimator is constructed in three steps. First they estimate the unit and day fixed effects from equation 1 using only untreated observations. The estimates are then used in the second step to obtain unbiased estimates of the treatment effects  $\hat{\tau}_{it} = V_{it} - \hat{\alpha}_i - \hat{\alpha}_t$ . While these day-unit treatment effects cannot be estimated consistently, they show that consistent estimates can be obtained for averages of many observations. In the final step the average

$$\hat{\tau}_h = \frac{1}{|I_h|} \sum_{i \in I_h} \hat{\tau}_{i, E_i + h} \quad (2)$$

is therefore computed for the  $h$  days since treatment where  $I_h$  is the set of cities observed in period  $E_i + h$ .

Their approach is particularly appealing in this setting since the application is straightforward and allows for a flexible inclusion of both time-variant and time-invariant control variables which speaks to the available data. It also allows easy assessment of whether the identifying assumption of parallel trends holds. Unlike in a conventional event study approach, pre-trends are not estimated together with the treatment effects but separately by estimating the following regression for untreated observations only:

$$V_{it} = \alpha_i + \alpha_t + \sum_{p=-P}^{-1} \gamma_p 1[t = E_i + p] + \varepsilon_{it} \quad (3)$$

where  $1[t = E_i + p]$  are variables indicating if a unit is treated 1 to  $P$  days later. The pre-trend coefficients can be computed simultaneously with the treatment effects although the effects are estimated separately rather than jointly which has further attractive properties.<sup>19</sup>

---

18. See also Cengiz et al. (2019) for an example of a stacked regression approach.

19. For a detailed discussion of the approach and an application to school closures on the transmission of COVID-19 see Von Bismarck-Osten, Borusyak, and Schönberg (2021).

### 3.3 Main Results

The articles collected on the White Feathers record either concrete incidents or report on the movement more generally. In cases where events are reported it must have taken at least one day before the report of the event can be found in the local news. To take this into account, the treatment indicator is redefined to switch from zero to one **two days before treatment.**

Figure 6 shows the results from the estimation of the treatment effects as defined in equations 1 and 2 (blue dots) and the results from the estimation of the pre-trends as defined by equation 3 (red squares). The shaded areas indicate the 95% confidence level around the estimated coefficients.

[Figure 6 about here.]

The pre-trend coefficients are all close to zero and statistically insignificant. They do not exhibit a clear upward or downward trend. The F-test accepts the hypothesis that the pre-trend coefficients are jointly equal to zero with a p-value of 0.07. This supports the identifying assumption of parallel trends.

The treatment effects are significantly different from zero on the 5% level and positive on days three, four, seven to eleven and fourteen after treatment. This therefore suggest that the White Feathers increased the volunteering rates during the early days of the war. The average volunteering rate in the 10 days before treatment is 0.163%. The effect is largest on day four or – keeping in mind that the treatment indicator switches to from zero to one two days before the date of publication of an article – two days after article publication. On that day, the increase in the volunteering share due to reporting on the White Feathers Girls is 0.155 percentage points. **This implies that two days after a local paper reports on the movement, the volunteering share almost doubles in the treated cities.**

The average treatment effect over the first ten days after publication of an article is 0.06 percentage points. This implies that in comparison to the ten days before treatment the

average daily volunteering share increases in the treated cities by 36.6% for about ten days after an article is published.<sup>20</sup> This corresponds to **approximately 33,000 soldiers which is equivalent to 6.26% of the recruits who have in total signed up in August, September and October 1914.**<sup>21</sup>

Note that the effect is not reversed on subsequent days and in subsequent weeks. Figure D.6 in the Appendix shows the treatment effect in the two months after treatment and also indicates no reversal over this longer period. This suggests that the men who volunteered because of the White Feather Girls would not have done so otherwise, i.e. this suggests the White Feather Girls did not just bring the decision to volunteer of these men forward.

## **3.4 Robustness**

### **3.4.1 Including Controls**

In this section, I make use of a number of control variables that I have not taken into account in the previous analysis. The previous estimation takes into account constant characteristics of locations that could be relevant for recruitment. A potential concern could be that fixed characteristics of the cities have a time-varying component that affects volunteering. To meet this concern I use time-invariant information from the 1911 census and include the variables as interactions with period dummies. I include the share of females to deal with any potential concerns arising from the small but statistically significant difference between the treated and the control group as seen in Table 1. Furthermore, I include the share of the population born in another country as national identity might be an important determinant in the decision to go to war as well as a measure for the share of young individuals in the population. To control for economic factors that might impact volunteering rates, I include the share of self-employed, the share of farmers, and the share of those in paid employment.

As Figure 1 suggests recruitment might be (negatively) related to casualties. I therefore

---

20. The standard error for this estimate is 0.1350.

21. These numbers are based on a back-of-the-envelope calculation.

control for the number of dead soldiers. Since I have information on the date of death and the residence of those soldiers I can assign them to the recruiting cities in the data. The results using census controls and a control variable on the number of casualties are reported in Figure 7. The left panel shows results including the above mentioned information from the 1911 census, the right panel controls for casualties in addition to that.

As the figure shows, the results are robust to the inclusion of those controls. Again, none of the pre-trend coefficients is significantly different from zero and they do also not indicate a clear trend suggesting that the parallel trend assumption continues to hold. The general pattern for the daily treatment effects is also largely similar to the main results discussed in the previous section. The effect of White Feather Girls activity on volunteering is significantly different from zero on days three and four as well as on days seven to twelve and fourteen after treatment when census controls are included as in Panel (a) of Figure 7. The effect is slightly larger and estimated with more precision. On average, the volunteering share is 0.06 percentage points higher in the 11 days after there has been an article on the White Feather Girls. In comparison to the average in the ten days before treatment, recruitment was therefore 45%<sup>22</sup> higher. Adding the number of soldiers who died (in logs) as a further control does not change the results notably as shown in Panel (b) of Figure 7.

[Figure 7 about here.]

### 3.4.2 Controlling for News Sentiment

A further concern could be that the articles on the White Feather movement are just picking up other trends of war reporting in the newspapers. Using the random sample of articles from the BNA corpus, I therefore compute two measures to control both for the topics covered by the news as well as for the sentiment of the news.

I have obtained approximately 250,000 articles from the British Newspaper Archive covering the period at the beginning of WWI for which I have information on recruitment. They were

---

22. The standard error of this estimate is 0.1415. Average recruiting in the eleven days before is 0.159%.

randomly selected from the overall BNA corpus making sure that the different periodicity of the newspapers is reflected. In a first step, I create a topic model. The idea of topic modeling is to classify documents or, as is the case here, articles into natural groups in an unsupervised way. One of the most common algorithms used for topic modeling is the Latent Dirichlet Allocation (LDA). It assumes that **every document is a mixture of topics and that every topic is a mixture of words**. The LDA estimates both the mixture of words and the mixture of topics at the same time. In a first step, I have trained the algorithm on a 50% random sample of articles of the 250,000 articles in the data set on a five-topic model.

The five topics with the 25 most important terms by topic can be found in Figure 8 below. The y-scale depicts the **per-topic-per-word probabilities,  $\beta$ , from the model**. As was expected, the war plays an important role in newspaper reporting during the time. Topic 1 appears to be a representation of reporting from the front and recent war events with the most important words being “german”, “enemi” and “war” itself.<sup>23</sup> The war is also important in topic 4 but unlike in topic 1 it is rather a subject of politics as the topic features terms such as “committee”, “council”, “state” and “govern” otherwise. Topics 2 and 3 are unrelated to the war. The second topic does not show a relation to war topics but covers the economy featuring words such as “good”, “price”, “sale” and “market”. The third topic cannot easily be characterized.

Topic 5 indirectly relates to the war covering the reporting of casualties with words like “church”, “death” and several common names such as “john” and “william” among the most important words. Including a control for topic 5 can thereby also cover potential concerns that it is not the date of the casualties which matters for enlistment but the day when the casualties are reported in the news. For strategic reasons and potential delays in news transmission during the war, more or less time might have passed between those dates. I can therefore provide an alternative approach to account for the effect of casualties on volunteering in the estimation.

---

23. Word stems were used in the analysis and are also shown here.

[Figure 8 about here.]

In a second step, I have then used the remaining half of articles in the data set and applied the algorithm to classify the articles into one of the five topics. For each article, I have computed the probabilities to fall into each of the five topics and assigned it to the topic it is most likely to belong to. For every recruiting city and every day the data covers I have then looked at the articles published by newspapers within a radius of 50km. Finally, I have computed the share of articles falling into each of the five topics.

[Figure 9 about here.]

Apart from the topics covered by the news, it is also possible that the news sentiment contributed to the decision to volunteer. The tone with which the news is spread could potentially matter just as much as the content or at least shape how the content is perceived. To characterize the news in terms of their sentiment, every word in every article was categorized using the NRC Word-Emotion Association Lexicon. The lexicon consists of a list of English words and their association with eight basic emotions which are anger, fear, disgust, surprise, anticipation, sadness, joy and trust. The annotations were done manually using crowdsourcing (for details see Mohammad and Turney (2013)).

Rather than using all eight categories, I have categorized words according to whether they were annotated with a **negative sentiment (anger, fear, disgust, sadness)** or with a **positive sentiment (surprise, anticipation, joy and trust)**. This has been done to avoid considerable miss-classification as many words are associated with more than one emotion. For each recruiting city, I have pooled the articles published with a radius of 50 km each day and computed the number of words with a negative sentiment as a share of all words. This serves as an indicator for negative news sentiment in the vicinity of each recruiting city.

Figure 9 shows the imputation results including the controls both for the topics covered as well as for the sentiment of the news. In general, the results are very similar to the specification without controls depicted in Figure 6. The pre-trend coefficients are all close

to zero and statistically insignificant. As before, we see a positive treatment effect in the days after treatment which is similar in magnitude to the previously estimated effect. The average effect over the ten days after a White Feather article has been published is 0.06 percentage points which implies that volunteering increased on average by 36.6%.<sup>242526</sup>

### 3.4.3 Excluding the Late Treated

While the majority of recruiting cities have been treated soon after the White Feather movement was initiated, some cities are treated only later. To test whether the results are in some way driven by these late treated units, I restrict the sample in two steps. First, I exclude all cities that were treated in 1915 only and in a second step I also exclude cities that have been treated after September 1914. The results are depicted in Figure 10 in the left panel for the sample comprising only cities treated in 1914 and in the right panel for cities treated in August and September 1914. In both cases, the treatment effects are not different from those estimated based on the full sample. We see that the pre-trend coefficients are estimated with less precision but still insignificant on the 95%-level.

[Figure 10 about here.]

### 3.4.4 Generalized Synthetic Control Approach

The previous results strongly indicate that the assumption of parallel trends in the difference-in-differences approach is satisfied and that the estimated treatment effects therefore are identified. Nevertheless, I present results based on the Generalized Synthetic Control (GSC) method which allows me to relax this assumption. The Generalized Synthetic Control method proposed by Xu (2017) and Liu, Wang, and Xu (2020) uses the control group data in a first step to estimate an interactive fixed effect model where unit-specific intercepts

---

24. The standard error for this estimate is 0.1356.

25. The effect is 0.1 percentage points larger than in the baseline specification which is not using any additional controls.

26. Figure D.7 in the Appendix shows the results including census controls, controls for the number of soldiers who died and controls for news sentiment. Again, news sentiment does not change results much in comparison to those presented in Figure 7.

are interacted with time-varying coefficients. The latter, also referred to as latent factors, are then used to compute factor loadings for each treated unit by using only pre-treatment outcomes. In the final step, the treated counterfactuals are imputed based both on the estimated factors and the factor loadings. The GSC approach can thus generalize the synthetic control approach as it allows for multiple treated units and variable treatment periods.<sup>27</sup>

Figure 11 shows the estimated treatment effects using GSC which support our previous findings. There are no significant differences in the pre-trends prior to treatment with an exception in day 9 before treatment occurs. The effect is then statistically significant and positive in the first 11 days after treatment. The overall effect is of very similar magnitude as the results from the imputation method proposed by Borusyak, Jaravel, and Spiess (2021). The generalized synthetic control method hence further confirms our previous findings.

[Figure 11 about here.]

## 4 Conclusion

This study uses newly-collected data on WWI volunteering in 121 cities in England and Wales to examine the effect of public shaming on volunteering rates. Using information from local newspapers, I build a measure for the activity of the White Feather Girls and examine how volunteering rates change after a city receives the first news about the movement. In a difference-in-difference design with staggered treatment I find that the White Feather Girls had a significantly positive impact on volunteering in the ten days after the news was received.

The results highlight a new aspect of social image concerns: even concerns evoked by strangers have the power to induce potentially fatal decisions. In particular, I find that men take extreme actions when they see their masculinity questioned. As pointed out by

---

<sup>27</sup>. For specific weights, the GSC approach coincides with the approach of Borusyak, Jaravel, and Spiess (2021).



Virginia Woolf<sup>28</sup> “[e]xternal observation would suggest that a man still feels it a peculiar insult to be taunted with cowardice by a woman in much the same way that a woman feels it a peculiar insult to be taunted with unchastity by a man.” The White Feather Girls tapped directly into these emotions. By publicly humiliating men in civilian clothes, young women also suggested that their chances for finding a mate would be low. While many psychologists consider shame a dysfunctional emotion at the individual level (e.g. Dickerson, Gruenewald, and Kemeny 2004), it might act as an important driver of moral and pro-social behavior, and hence be useful on the group level (Beall and Tracy 2020). Experimental evidence suggests that public shaming can successfully alter pro-social behavior in settings with low stakes such as charitable giving and tax compliance (DellaVigna, List, and Malmendier 2012; Perez-Truglia and Troiano 2018). This paper thus also provides evidence on the functionality of shame in a real-world setting with extremely high stakes and underlines the importance of social emotions in inducing altruistic behavior.<sup>29,30</sup>

Later in the war, the British government itself utilized women and also children to shame men into volunteering.<sup>31</sup> As this study shows, public shaming *can* be highly effective in inducing altruistic behavior. However, it remains to be studied under which conditions shaming achieves its desired outcome. It is also possible that some individuals react defiantly when shamed in public. This study raises the question about the morality of “nudging” and other forms of exploiting feelings as a matter of public policy, trying to enforce the law or to establish norms (e.g. Nussbaum 2009).

---

28. Virginia Woolf, *Three Guineas* (1938), <https://gutenberg.net.au/ebooks02/0200931h.html>.

29. The role of shame in shaping social norms has been studied theoretically (Bénabou and Tirole 2006). Using a structural approach and experimental data, Butera et al. (Forthcoming) analyze the welfare effects of shame.

30. Recent findings suggest that shame is a universal system and part of our cooperative biology rather than a product of cultural evolution (Sznycer et al. 2018).

31. Figure E.8 in the Appendix shows examples of official recruitment posters used by the government.

## References

- Ager, Philipp, Leonardo Bursztyn, Lukas Leucht, and Hans-Joachim Voth. Forthcoming. “Killer Incentives: Rivalry, Performance and Risk-Taking among German Fighter Pilots, 1939-45.” *The Review of Economic Studies*.
- Athey, Susan, and Guido Imbens. 2018. *Design-based Analysis in Difference-In-Differences Settings with Staggered Adoption*.
- Baker, Andrew, David F Larcker, and Charles CY Wang. 2021. *How Much Should We Trust Staggered Difference-In-Differences Estimates?* Technical report, ECGI Working Paper. ECGI.
- Beall, Alec T., and Jessica L. Tracy. 2020. “The Evolution of Pride and Shame.” In *The Cambridge Handbook of Evolutionary Perspectives on Human Behavior*, edited by Lance Workman, Will Reader, and Jerome H. Barkow, 179–193. Cambridge Handbooks in Psychology. Cambridge University Press.
- Bénabou, Roland, and Jean Tirole. 2006. “Incentives and Prosocial Behavior.” *American Economic Review* 96, no. 5 (December): 1652–1678.
- Borusyak, Kirill, and Xavier Jaravel. 2017. *Revisiting Event Study Designs, with an Application to the Estimation of the Marginal Propensity to Consume*. Technical report, Working Paper.
- Borusyak, Kirill, Xavier Jaravel, and Jann Spiess. 2021. *Revisiting Event Study Designs: Robust and Efficient Estimation*. Technical report, Working Paper.
- Bowles, Samuel. 2009. “Did Warfare Among Ancestral Hunter-Gatherers Affect the Evolution of Human Social Behaviors?” *Science* 324 (5932): 1293–1298.
- Bowles, Samuel, and Herbert Gintis. 2005. “Prosocial Emotions.” In *The Economy as an Evolving Complex System, III: Current Perspectives and Future Directions*, edited by Lawrence E. Blume and Steven N. Durlauf, 339–366. Oxford University Press, October.
- Bursztyn, Leonardo, Davide Cantoni, David Y. Yang, Noam Yuchtman, and Y. Jane Zhang. 2021. “Persistent Political Engagement: Social Interactions and the Dynamics of Protest Movements.” *American Economic Review: Insights* 3, no. 2 (June): 233–50.
- Bursztyn, Leonardo, Georgy Egorov, and Robert Jensen. 2019. “Cool to be Smart or Smart to be Cool? Understanding Peer Pressure in Education.” *The Review of Economic Studies* 86 (4): 1487–1526.

- Bursztyn, Leonardo, Bruno Ferman, Stefano Fiorin, Martin Kanz, and Gautam Rao. 2017. “Status Goods: Experimental Evidence from Platinum Credit Cards\*.” *The Quarterly Journal of Economics* 133, no. 3 (December): 1561–1595.
- Bursztyn, Leonardo, Thomas Fujiwara, and Amanda Pallais. 2017. “‘Acting Wife’: Marriage Market Incentives and Labor Market Investments.” *American Economic Review* 107, no. 11 (November): 3288–3319.
- Bursztyn, Leonardo, and Robert Jensen. 2015. “How Does Peer Pressure Affect Educational Investments? \*.” *The Quarterly Journal of Economics* 130, no. 3 (May): 1329–1367.
- . 2017. “Social Image and Economic Behavior in the Field: Identifying, Understanding, and Shaping Social Pressure.” *Annual Review of Economics* 9 (1): 131–153.
- Butera, Luigi, Robert Metcalfe, William Morrison, and William Taubinsky. Forthcoming. “Measuring the Welfare Effects of Shame and Pride.” *American Economic Review*.
- Callaway, Brantly, and Pedro H.C. Sant’Anna. 2020. “Difference-in-Differences with multiple time periods.” *Journal of Econometrics*.
- Cantoni, Davide, David Y Yang, Noam Yuchtman, and Y Jane Zhang. 2019. “Protests as Strategic Games: Experimental Evidence from Hong Kong’s Antiauthoritarian Movement\*.” *The Quarterly Journal of Economics* 134, no. 2 (January): 1021–1077.
- Cengiz, Doruk, Arindrajit Dube, Attila Lindner, and Ben Zipperer. 2019. “The Effect of Minimum Wages on Low-Wage Jobs\*.” *The Quarterly Journal of Economics* 134, no. 3 (May): 1405–1454.
- Chaisemartin, Clément de, and Xavier D’Haultfoeuille. 2020. “Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects.” *American Economic Review* 110, no. 9 (September): 2964–96.
- Choi, Jung-Kyoo, and Samuel Bowles. 2007. “The Coevolution of Parochial Altruism and War.” *Science* 318 (5850): 636–640.
- DellaVigna, Stefano, John A. List, and Ulrike Malmendier. 2012. “Testing for Altruism and Social Pressure in Charitable Giving \*.” *The Quarterly Journal of Economics* 127, no. 1 (January): 1–56.

- Dellavigna, Stefano, John A. List, Ulrike Malmendier, and Gautam Rao. 2016. "Voting to Tell Others." *The Review of Economic Studies* 84, no. 1 (October): 143–181.
- Dewey, P. E. 1984. "Military Recruiting and the British Labour Force during the First World War." *The Historical Journal* 27 (1): 199–223.
- Dickerson, Sally S., Tara L. Gruenewald, and Margaret E. Kemeny. 2004. "When the Social Self Is Threatened: Shame, Physiology, and Health." *Journal of Personality* 72 (6): 1191–1216.
- Enikolopov, Ruben, Alexey Makarin, and Maria Petrova. 2020. "Social Media and Protest Participation: Evidence From Russia." *Econometrica* 88 (4): 1479–1514.
- Fehr, Ernst, and Simon Gächter. 2000. "Cooperation and Punishment in Public Goods Experiments." *American Economic Review* 90, no. 4 (September): 980–994.
- . 2002. "Altruistic punishment in humans." *Nature* 415 (6868): 137–140.
- Fehr, Ernst, Simon Gächter, and Georg Kirchsteiger. 1997. "Reciprocity as a Contract Enforcement Device: Experimental Evidence." *Econometrica* 65 (4): 833–860.
- Ferguson, Niall. 1998. *The Pity of War - 1914–1918*. London: The Penguin Press.
- Gächter, Simon, and Ernst Fehr. 1999. "Collective action as a social exchange." *Journal of Economic Behavior & Organization* 39 (4): 341–369.
- Gerber, Alan S., Donald P. Green, and Christopher W. Larimer. 2008. "Social Pressure and Voter Turnout: Evidence from a Large-Scale Field Experiment." *American Political Science Review* 102 (1): 33–48.
- Gintis, Herbert. 2000. "Strong Reciprocity and Human Sociality." *Journal of Theoretical Biology* 206 (2): 169–179.
- . 2004. "The genetic side of gene-culture coevolution: internalization of norms and prosocial emotions." *Evolution and Altruism, Journal of Economic Behavior & Organization* 53 (1): 57–67.
- Goodman-Bacon, Andrew. 2021. "Difference-in-differences with variation in treatment timing." *Journal of Econometrics*.

- Gregory, Adrian. 2008. "British 'War Enthusiasm' in 1914: a Reassessment." In *Evidence, History and the Great War: Historians and the Impact of 1914-18*, 1st ed., 67–85. Berghahn Books.
- Grimalda, Gianluca, Andreas Pondorfer, and David P. Tracer. 2016. "Social image concerns promote cooperation more than altruistic punishment." *Nature Communications*.
- Gullace, Nicoletta F. 1997. "White Feathers and Wounded Men: Female Patriotism and the Memory of the Great War." *Journal of British Studies* 36 (2): 178–206.
- . 2002. *The Blood of Our Sons": Men, Women, and the Renegotiation of British Citizenship During the Great War*. New York: Palgrave MacMillan.
- Hallifax, Stuart. 2010. "'Over by Christmas': British popular opinion and the short war in 1914." *First World War Studies* 1 (2): 103–121.
- Hart, Peter J. 2010. "The White Feather Campaign: A Struggle with Masculinity During World War I." *Inquiries Journal* 2 (02).
- Imai, Kosuke, and In Song Kim. 2021. "On the Use of Two-Way Fixed Effects Regression Models for Causal Inference with Panel Data." *Political Analysis* 29 (3): 405–415.
- Kilday, Anne-Marie, and DS Nash. 2017. *Shame and modernity in Britain*. Springer.
- Liu, Licheng, Ye Wang, and Yiqing Xu. 2020. *A Practical Guide to Counterfactual Estimators for Causal Inference with Time-Series Cross-Sectional Data*. Technical report.
- Miller, William Ian. 2002. *The mystery of courage*. Harvard University Press.
- Mohammad, Saif M., and Peter D. Turney. 2013. "Crowdsourcing a Word-Emotion Association Lexicon." *Computational Intelligence* 29 (3): 436–465.
- Nussbaum, Marta C. 2009. *Hiding from Humanity: Disgust, Shame, and the Law*. Princeton University Press.
- Offer, Avner. 1995. "Going to War in 1914: A Matter of Honor?" *Politics & Society* 23 (2): 213–241.
- Perez-Truglia, Ricardo, and Ugo Troiano. 2018. "Shaming tax delinquents." *Journal of Public Economics* 167:120–137.

- Robb, George. 2014. *British Culture and the First World War*. Macmillan International Higher Education.
- Rusch, Hannes, Joost M. Leunissen, and Mark van Vugt. 2015. "Historical and experimental evidence of sexual selection for war heroism." *Evolution and Human Behavior* 36 (5): 367–373.
- Stevens, Kimberly Elisa. 2016. "Flight of the white feather: The expansion of the white feather movement throughout the World War One British Commonwealth." *MA Thesis, U of Southern Georgia*.
- Strezhnev, Anton. 2018. "Semiparametric weighting estimators for multi-period difference-in-differences designs."
- Sun, Liyang, and Sarah Abraham. Forthcoming. "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects." *Journal of Econometrics*.
- Szyncer, Daniel, Dimitris Xygalatas, Elizabeth Agey, Sarah Alami, Xiao-Fen An, Kristina I. Ananyeva, Quentin D. Atkinson, et al. 2018. "Cross-cultural invariances in the architecture of shame." *Proceedings of the National Academy of Sciences* 115 (39): 9702–9707.
- Von Bismarck-Osten, Clara, Kirill Borusyak, and Uta Schönberg. 2021. *The Role of Schools in Transmission of the SARS-CoV-2 Virus: Quasi-Experimental Evidence from Germany*. Technical report, CReAM Discussion Paper 22/20.
- Vugt, Mark Van, David De Cremer, and Dirk P Janssen. 2007. "Gender differences in cooperation and competition: The male-warrior hypothesis." *Psychological science* 18 (1): 19–23.
- Ward, Paul. 2001. "'Women of Britain Say Go': Women's Patriotism in the First World War." *Twentieth Century British History* 12 (1): 23–45.
- Xu, Yiqing. 2017. "Generalized Synthetic Control Method: Causal Inference with Interactive Fixed Effects Models." *Political Analysis* 25 (1): 57–76.

## Tables

Table 1: Sample Balancing.

	Full sample mean	Control mean	Treated mean	Difference
<b>Demographics</b>				
Age	28.69 (1.500)	28.86 (1.191)	28.56 (1.708)	0.293 (1.07)
Share of females in population	0.51 (0.021)	0.51 (0.022)	0.52 (0.020)	-0.00845* (-2.21)
Share of foreigners in population	0.01 (0.011)	0.01 (0.013)	0.01 (0.009)	0.000988 (0.49)
Share young (less than 14yo) in population	0.30 (0.024)	0.30 (0.019)	0.30 (0.027)	-0.00547 (-1.24)
Share old (more than 65yo) in population	0.06 (0.015)	0.06 (0.013)	0.06 (0.016)	0.00195 (0.73)
Share of working age (15 to 64yo) in population	0.64 (0.021)	0.64 (0.022)	0.64 (0.021)	0.00418 (1.06)
Share in labor among those of working age	0.69 (0.037)	0.69 (0.045)	0.69 (0.030)	0.000952 (0.14)
Share self-employed among those of working age	0.08 (0.019)	0.08 (0.019)	0.08 (0.020)	0.000938 (0.26)
Share paid among those of working age	0.45 (0.080)	0.44 (0.091)	0.46 (0.071)	-0.0135 (-0.92)
Share of farmers among those of working age	0.27 (0.170)	0.30 (0.163)	0.24 (0.174)	0.0513 (1.66)
Share of individuals within each occupation:				
Legislators, officials, managers	0.02 (0.006)	0.02 (0.007)	0.02 (0.005)	0.000336 (0.30)
Professionals	0.04 (0.010)	0.04 (0.011)	0.04 (0.010)	-0.000190 (-0.10)
Technicians and ass. professionals	0.01 (0.007)	0.01 (0.007)	0.01 (0.006)	0.000479 (0.39)
Clerks	0.05 (0.023)	0.05 (0.027)	0.05 (0.020)	-0.000888 (-0.21)
Service workers	0.26 (0.063)	0.25 (0.058)	0.26 (0.067)	-0.00227 (-0.20)
Skilled agricultural/fishery workers	0.15 (0.096)	0.16 (0.096)	0.13 (0.095)	0.0334 (1.92)
Crafts and related trades workers	0.30 (0.115)	0.27 (0.105)	0.32 (0.120)	-0.0444* (-2.15)
Plant and machine operators	0.10	0.10	0.10	0.000954
Observations	121	54	67	121

*Continued on next page.*

**Table 1 – continued from previous page**

	Full sample mean	Control mean	Treated mean	Difference
Elementary occupations	(0.056) 0.07	(0.054) 0.07	(0.058) 0.07	(0.09) 0.00385
Armed forces	(0.020) 0.01	(0.018) 0.02	(0.021) 0.01	(1.07) 0.00871
Share of women who are married	(0.026) 0.36	(0.032) 0.36	(0.020) 0.36	(1.82) 0.00383
Share of men who are married	(0.017) 0.37	(0.013) 0.37	(0.019) 0.37	(1.25) -0.00486
Share of women between 15 and 45 yo	(0.022) 0.52	(0.024) 0.52	(0.019) 0.51	(-1.22) 0.00306
Share of men between 15 and 45 yo	(0.023) 0.65	(0.023) 0.64	(0.023) 0.65	(0.73) -0.00731
	(0.028)	(0.036)	(0.018)	(-1.45)
<b>News coverage and sentiment</b>				
Share of articles topic 1	0.09 (0.045)	0.09 (0.045)	0.09 (0.046)	-0.00489 (-0.59)
Share of articles topic 2	0.17 (0.069)	0.16 (0.069)	0.17 (0.069)	-0.0160 (-1.26)
Share of articles topic 3	0.11 (0.057)	0.11 (0.058)	0.11 (0.057)	0.00222 (0.21)
Share of articles topic 4	0.11 (0.052)	0.11 (0.054)	0.11 (0.050)	0.00117 (0.12)
Share of articles topic 5	0.12 (0.056)	0.12 (0.058)	0.12 (0.055)	0.00281 (0.27)
Negative news sentiment	0.23 (0.100)	0.23 (0.102)	0.23 (0.098)	-0.00626 (-0.34)
Observations	121	54	67	121

Standard errors in brackets

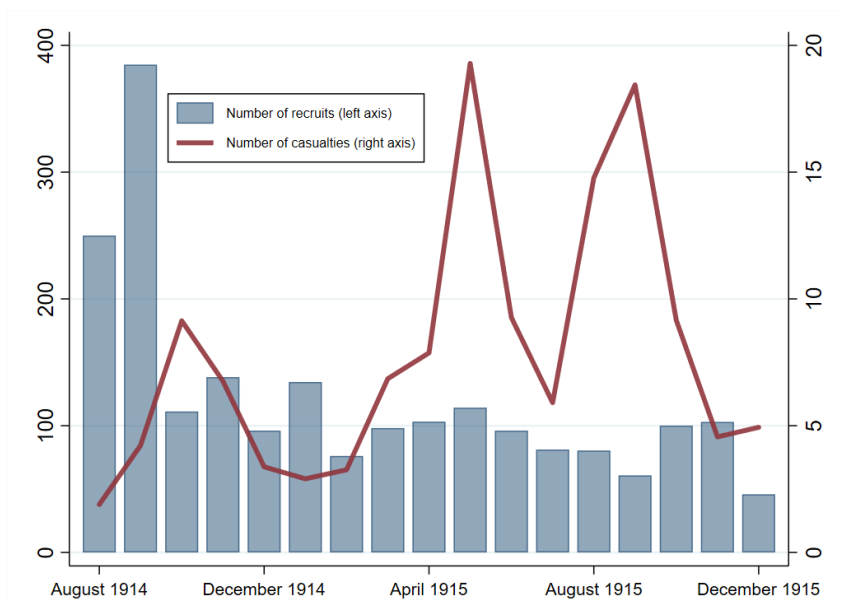
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*Note:* The table shows the mean of several demographic variables taken from the 1911 Census for the whole sample and for the control group and the treated group separately as well as the difference between the control and the treated group. The census was used on the level of parishes and all parishes were assigned to the nearest recruiting city to obtain relevant demographics. Variables on news sentiment and coverage were computed as described in Section 3.4.2. The topics are defined as determined by the Latent Dirichlet Algorithm. For details see also Section 3.4.2 and in particular Figure 8.



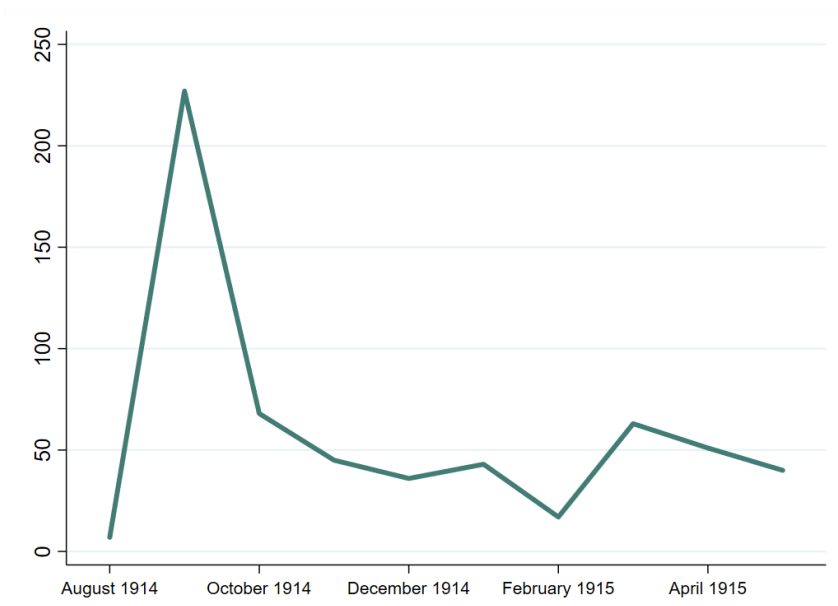
# Figures

Figure 1: Volunteering and Casualties per month (in thousands)



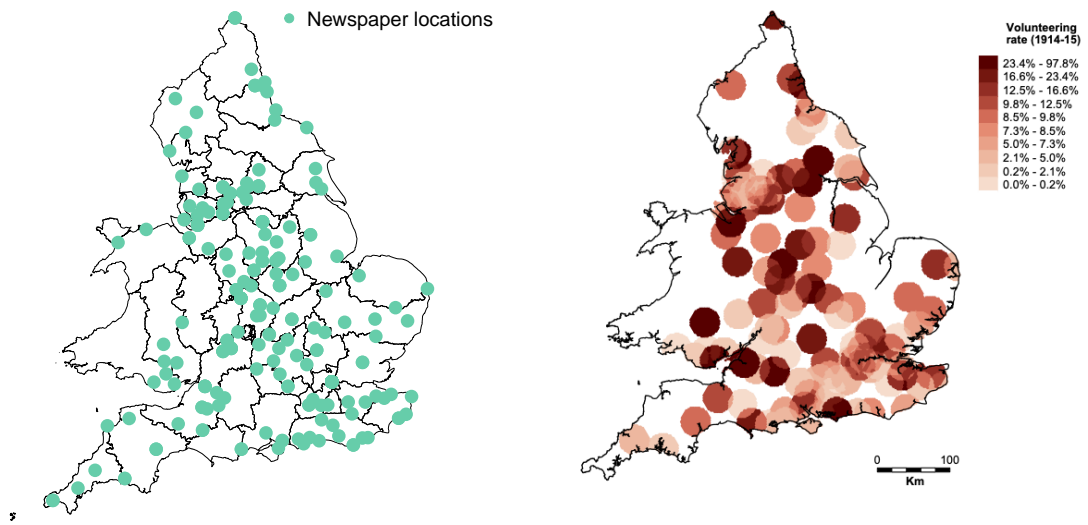
*Note:* The blue bars show the monthly number of recruits accepted for the Army and the Navy in the United Kingdom between August 1914 and December 1915 (left axis). The data has been digitized from NATS 1/399, National Archives (Kew). The red line shows the number of casualties per month obtained from the Naval & Military Press (right axis). All numbers are in thousands.

Figure 2: Articles on the White Feather Girls



*Note:* The graph shows the monthly aggregated number of articles that refer to the White Feather movement found in the British Newspaper Archive for the period between August 1914 and May 1915.

Figure 3: White Feathers and Volunteering

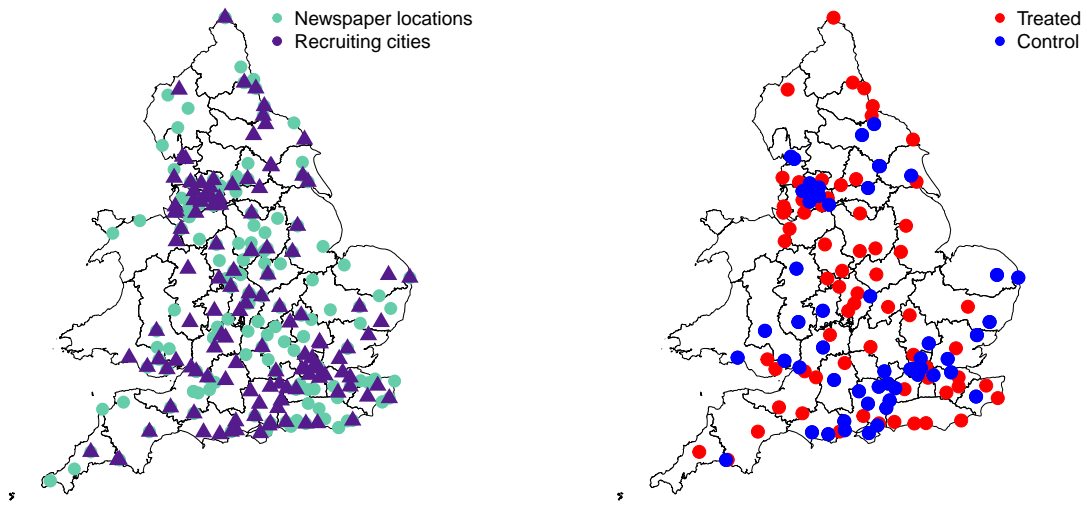


(a) Publishing Cities

(b) Volunteering in Recruiting Cities

*Note:* Panel (a) shows the places in England and Wales in which a local newspaper was published. The data comprises all local newspapers found for the period between August 1914 and May 1915 in the British Newspaper Archive and use the places of publication provided there. Panel (b) on the right shows volunteering rates in the 121 recruiting cities for which daily volunteering rates are available aggregated for the period between August 1914 and May 1915. The data has been digitized from historical tables kept at the National Archives (Kew) (NATS 1/398).

Figure 4: Assignment of Treatment

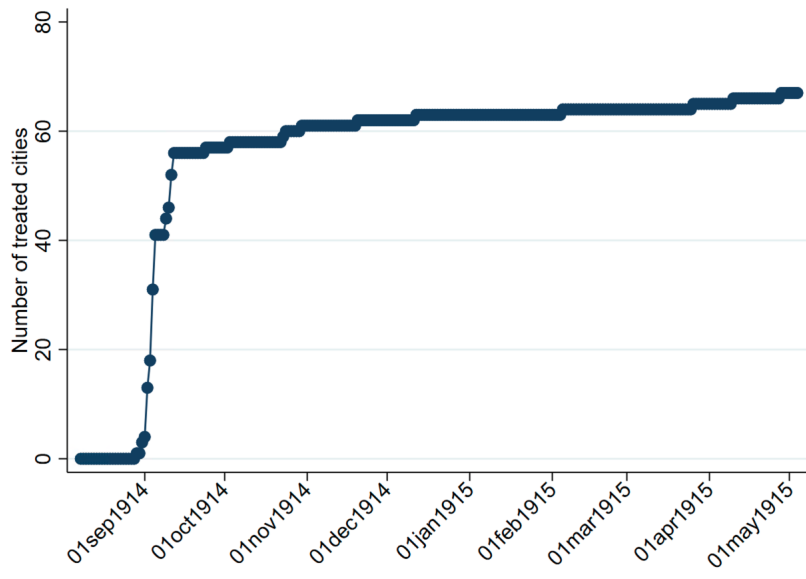


(a) Recruiting and Publishing Cities

(b) Treated and Control Cities

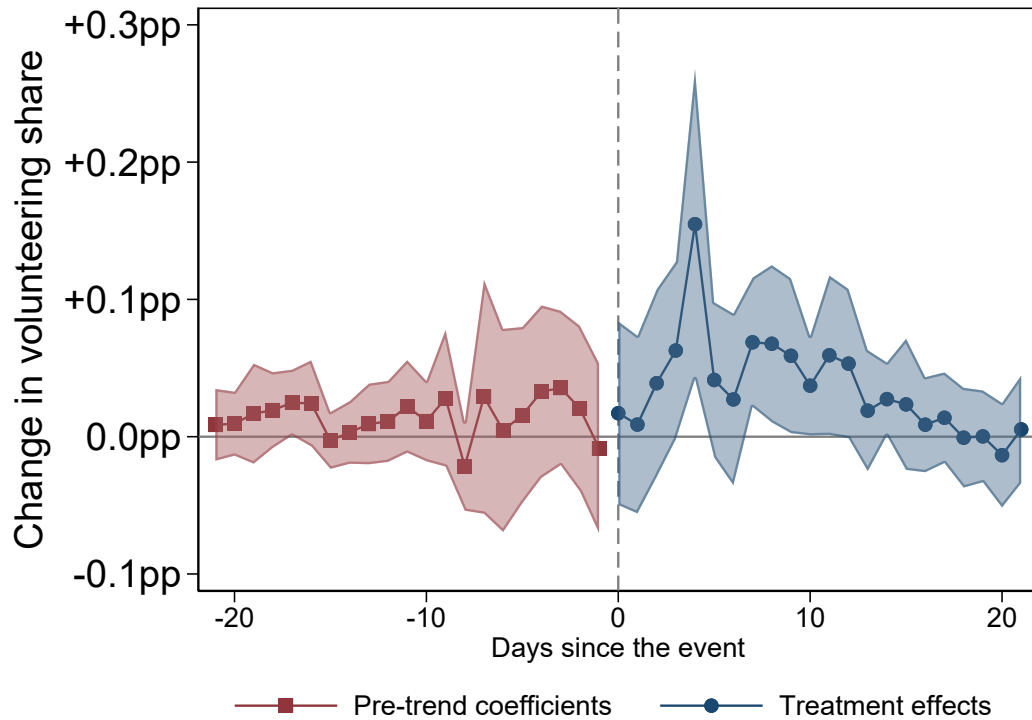
*Note:* The blue dots in Panel (a) mark the places in England and Wales in which a local newspaper was published. The data comprises all local newspapers found for the period between August 1914 and May 1915 in the British Newspaper Archive and use the places of publication provided there. The purple triangles in Panel (a) show the locations of the 121 recruiting cities for which we have daily recruitment data. Panel (b) shows how recruiting cities were divided into treated and control cities according to the treatment definition. A city is considered treatment after it has been the closest city to a newspaper publishing an article on the White Feathers.

Figure 5: Change in Treatment Status over Time



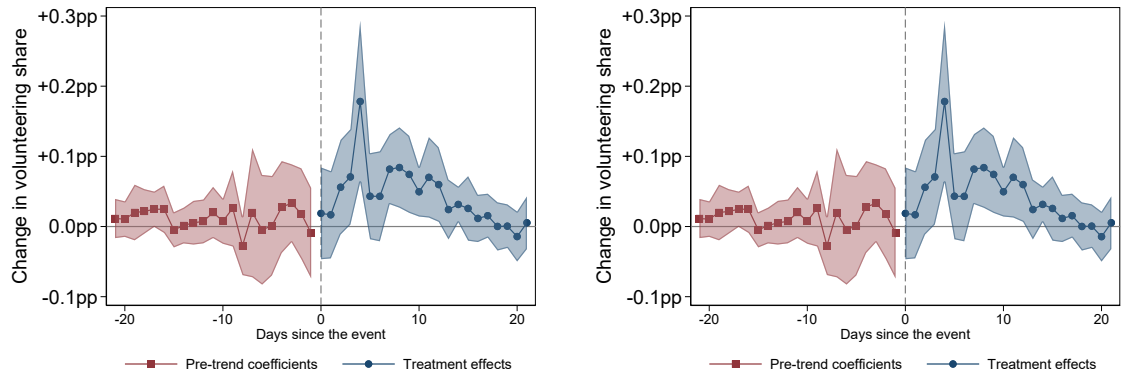
*Note:* The graph shows the number of treated cities over time, i.e. for each day covered by the data it shows the number of cities who have been closest to the place where an article on the White Feather Girls has been published. Only the first article published in each location on the White Feather Girls is taken into account.

Figure 6: Effect of White Feather Activity on Volunteering



*Note:* The graph shows the results for pre-trend testing (red squares) based on equation (3) and treatment effect estimation (blue dots) using the imputation approach for difference-in-differences designs proposed by Borusyak, Jaravel, and Spiess (2021). The shaded red and blue areas indicate the 95% confidence intervals for the estimates. The sample comprises all 121 recruiting cities. Effect and pre-trends are shown for three weeks around the event date which is set to two days before the publication date of an article. A city is defined as treated after it has been closest to a newspaper publishing on the White Feathers for the first time. The outcome of interest is the volunteering share defined as the number of daily volunteers divided by the number of eligible men from the 1911 Census.

Figure 7: Effect of White Feather Activity on Volunteering (including Controls)

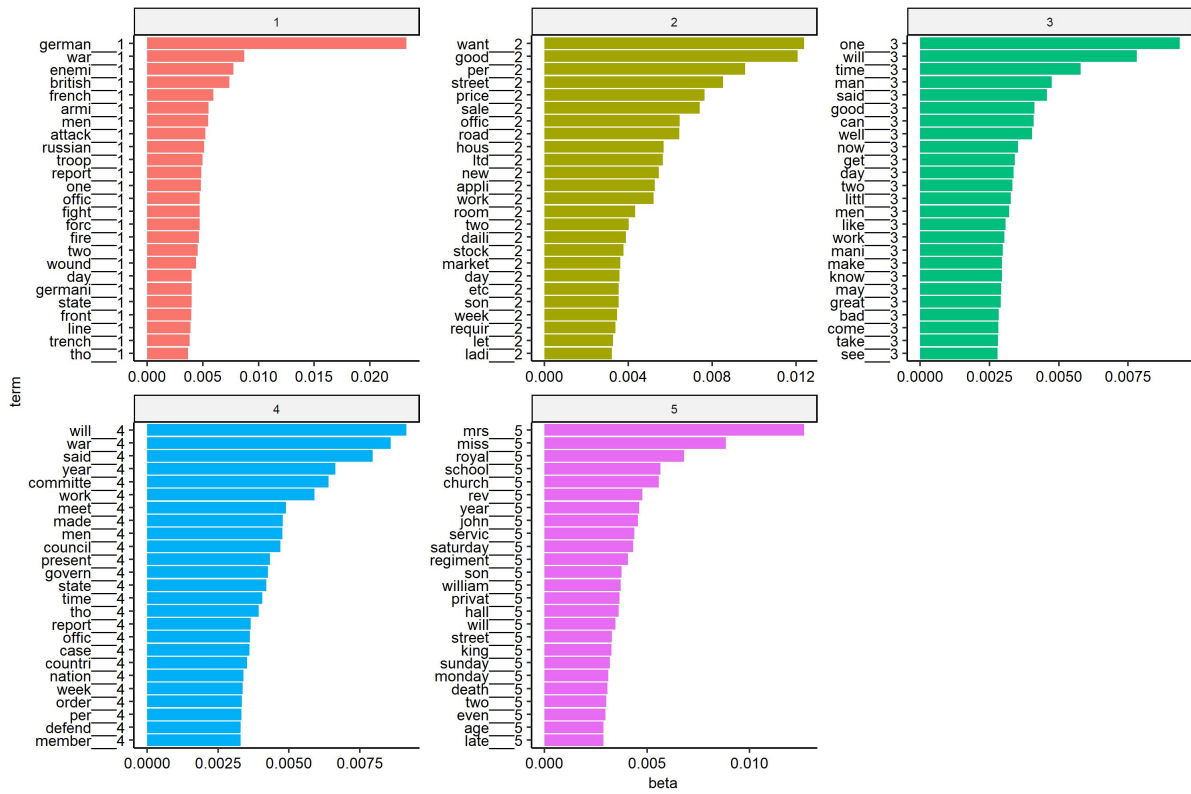


(a) Including Census Controls

(b) Including Census Controls and Control on Casualties

*Note:* The graph shows the results for pre-trend testing (red squares) based on equation (3) and treatment effect estimation (blue dots) using the imputation approach for difference-in-differences designs proposed by Borusyak, Jaravel, and Spiess (2021). The shaded red and blue areas indicate the 95% confidence intervals for the estimates. The sample comprises all 121 recruiting cities. Effect and pre-trends are shown for three weeks around the event date which is set to two days before the publication date of an article. A city is defined as treated after it has been closest to a newspaper publishing on the White Feathers for the first time. The outcome of interest is the volunteering share defined as the number of daily volunteers divided by the number of recruitable men from the 1911 Census. Controls from the Census comprise the share of females, the share of the population born in another country, the share of young individuals in the population, the share of self-employed, the share of farmers and the share of those in paid employment. Casualties are the number of soldiers who died each day whose residence is in an area assigned to the respective recruiting cities. Information on soldiers who died come from the Naval & Military Press.

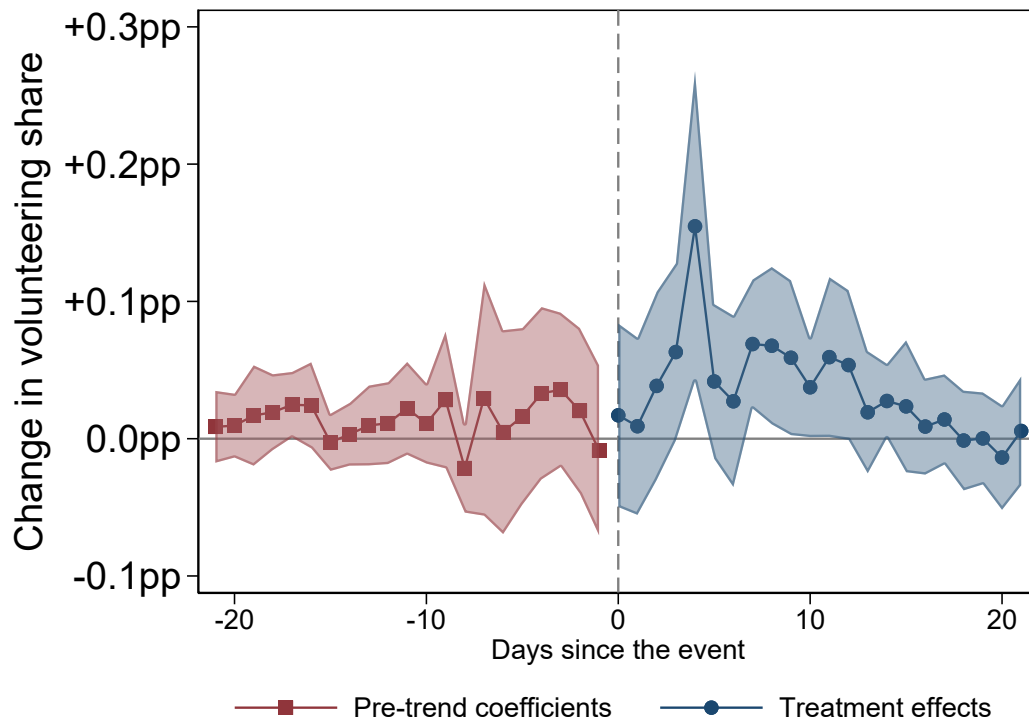
Figure 8: Latent Dirichlet Allocation (LDA) on Articles from Local Newspapers



Note: The Latent Dirichlet Allocation (LDA) was trained on a random sample of 125,000 articles from our sample of local newspaper articles collected from the British Newspaper Archive. The Figure depicts the five topics with the 25 most important terms by topic. The y-scale depicts the per-topic-per-word probabilities,  $\beta$ , from the model.

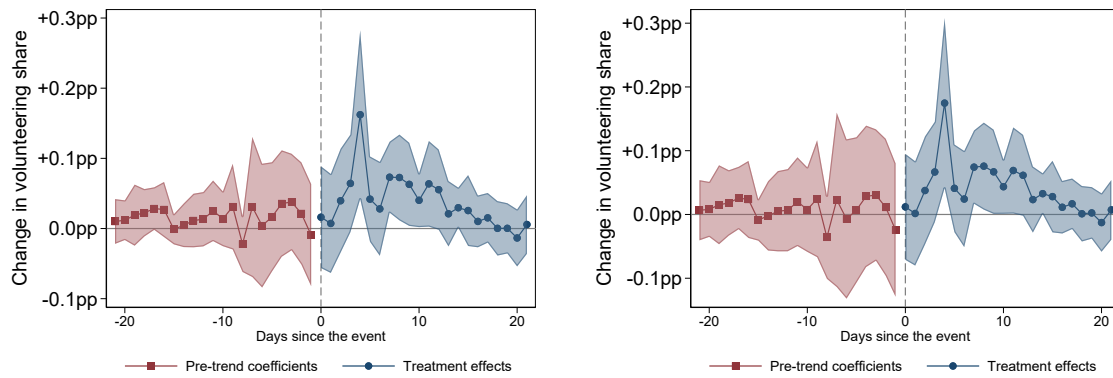


Figure 9: Effect of White Feather Activity on Volunteering – Controlling for News Sentiment



*Note:* The graph shows the results for pre-trend testing (red squares) based on equation (3) and treatment effect estimation (blue dots) using the imputation approach for difference-in-differences designs proposed by Borusyak, Jaravel, and Spiess (2021). The shaded red and blue areas indicate the 95% confidence intervals for the estimates. The sample comprises all 121 recruiting cities. Effect and pre-trends are shown for three weeks around the event date which is set to two days before the publication date of an article. A city is defined as treated after it has been closest to a newspaper publishing on the White Feathers for the first time. The outcome of interest is the volunteering share defined as the number of daily volunteers divided by the number of recruitable men from the 1911 Census. Controls include the daily share of articles within a radius of 50km around the recruiting cities falling into each of the five topics defined by the LDA as depicted in Figure (8). Topic 3 serves as the reference. I also control for negative sentiment measured as the daily share of articles dominantly associated with a negative emotion (anger, fear, disgust and sadness) within a 50km radius around the recruiting cities.

Figure 10: Effect of White Feather Activity on Volunteering – Restricting the Sample

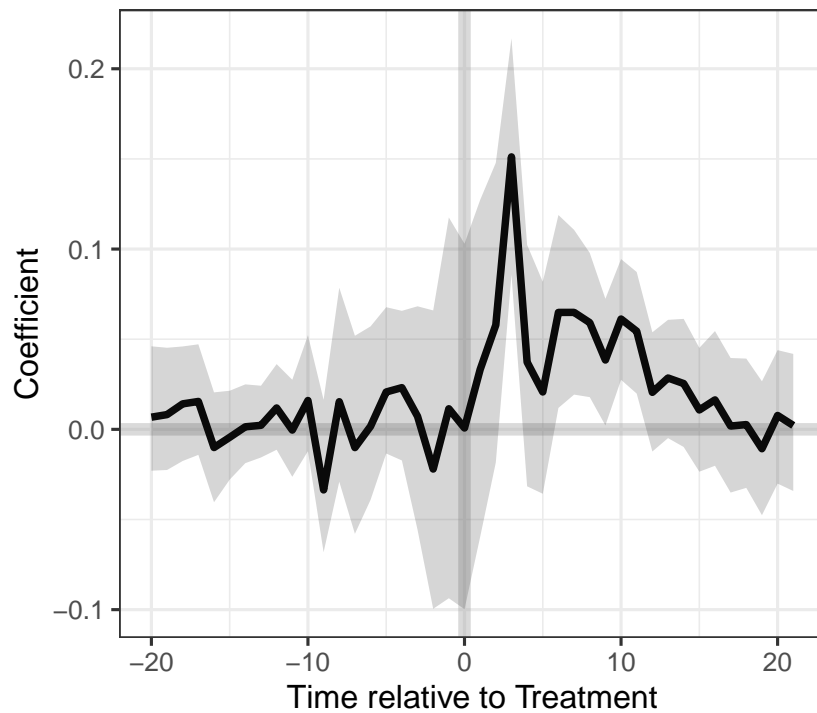


(a) Exclude late treated (1915)

(b) Exclude late treated (after September 1914)

*Note:* The graphs show the results for pre-trend testing (red squares) based on equation (3) and treatment effect estimation (blue dots) using the imputation approach for difference-in-differences designs proposed by Borusyak, Jaravel, and Spiess (2021). The shaded red and blue areas indicate the 95% confidence intervals for the estimates. The sample for Panel (a) comprises 117 recruiting cities as it excludes those cities that were treated only in 1915. Panel (b) comprises 111 cities as it also excludes those treated after September 1914. Effect and pre-trends are shown for three weeks around the event date which is set to two days before the publication date of an article. A city is defined as treated after it has been closest to a newspaper publishing on the White Feathers for the first time. The outcome of interest is the volunteering share defined as the number of daily volunteers divided by the number of recruitable men from the 1911 Census.

Figure 11: Effect of White Feather Activity on Volunteering – Generalized Synthetic Control Approach

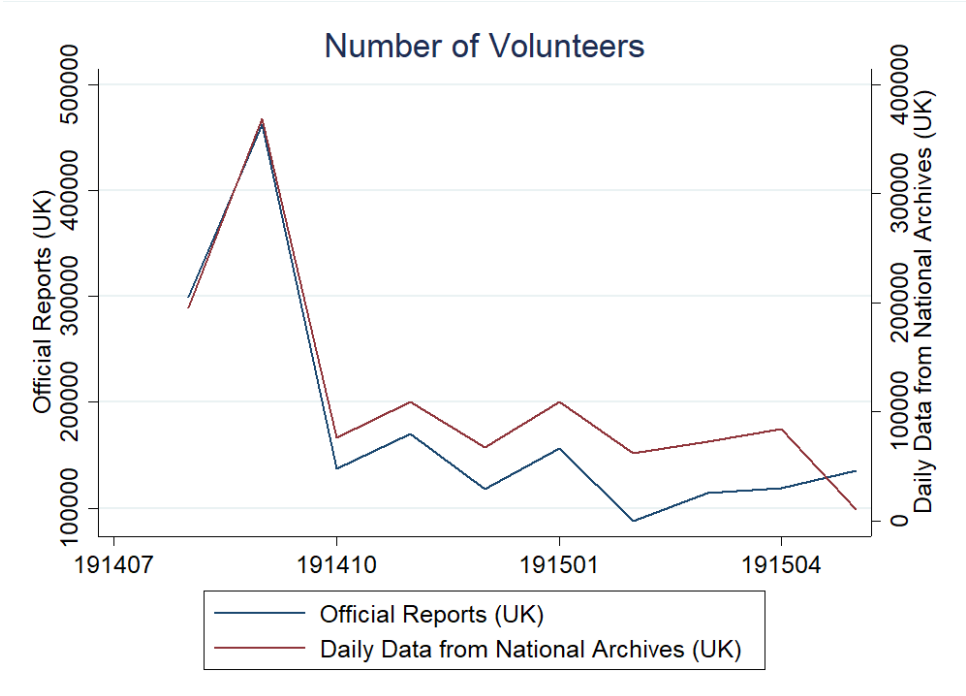


*Note:* The figure provides estimation results based on the Generalized Synthetic Control (GSC) Method proposed by Xu (2017). Panel (a) shows the treated (black line) and the control averages (blue line) for three weeks (21 days) before and after the day of treatment. Panel (b) shows the estimated treatment effect and the pre-trend estimated, again for three weeks (21 days) before and after treatment occurs. The gray-shaded areas indicate confidence intervals based on bootstrapped standard errors. The sample comprises all 121 recruiting cities. In both panels, the y-axis indicates the volunteering rate in percent.

# Appendix

## A Recruiting Data

Figure A.1: Comparison of Recruiting Numbers



Note: The figure compares the recruiting numbers from official reports (left axis) to the numbers digitized from the historical records from the National Archives (Kew) (NATS 1/398) for the period between August 1915 and May 2915.



## B Debate in the House of Commons

Figure B.3: Discussion in House of Commons

### WHITE FEATHERS (INSULTING CONDUCT).

[548]

43. Mr. CATHCART WASON asked the Home Secretary if he is aware that persons employed directly or indirectly in the service of the State are subjected to insolence and provocation at the hands of some advertising young women presenting them with white feathers; and if he will give orders to the police to arrest such persons for acting in a manner likely to create a breach of the peace?

Mr. McKENNA: I agree with my hon. Friend in thinking the practice very objectionable and not likely to assist recruiting, but I am informed by the Commissioner of Metropolitan Police that no complaint in the matter has reached the police, and I do not think the risk of the practice leading to breach of the peace is so great as to justify the action which my hon. Friend suggests.

Mr. C. WASON: May I ask the right hon. Gentleman whether, if he is unable to assist in the manner indicated, he would make it easier for badges to be issued to persons employed?

Mr. McKENNA: That question should be addressed to the naval and military authorities.

*Note:* Excerpt from transcription of debate in the House of Commons on Monday, 1st March, 1915, column 548 ff. <https://parlipapers.proquest.com/parlipapers/docview/t71.d76.cds5cv0070p0-0005>.

# C Local Newspapers

Figure C.4: Newspaper Article on the White Feather Girls

CRICKET POST.  
**The Yorkshire Evening Post.**

**THE WHITE FEATHER BRIGADE**  
An amusing, novel, and forceful method of obtaining recruits for Lord Kitchener's Army was demonstrated at Deal, when the town crier paraded the town, and, crying with all the dignity of his ancient calling, gave forth the following startling announcement:—  
"Oyez! Oyez!! Oyez!!!  
"The White Feather Brigade!  
"Ladies wanted, to present to the young men of Deal and Walmer, who have no one dependent upon them, the Order of the White Feather for shirking their duty in not coming forward to uphold the Union Jack of Old England!  
"God save the King."

(a) Article on White Feather Girls

**THE DAILY CITIZEN,**  
**FRIDAY, DECEMBER 18, 1914.**

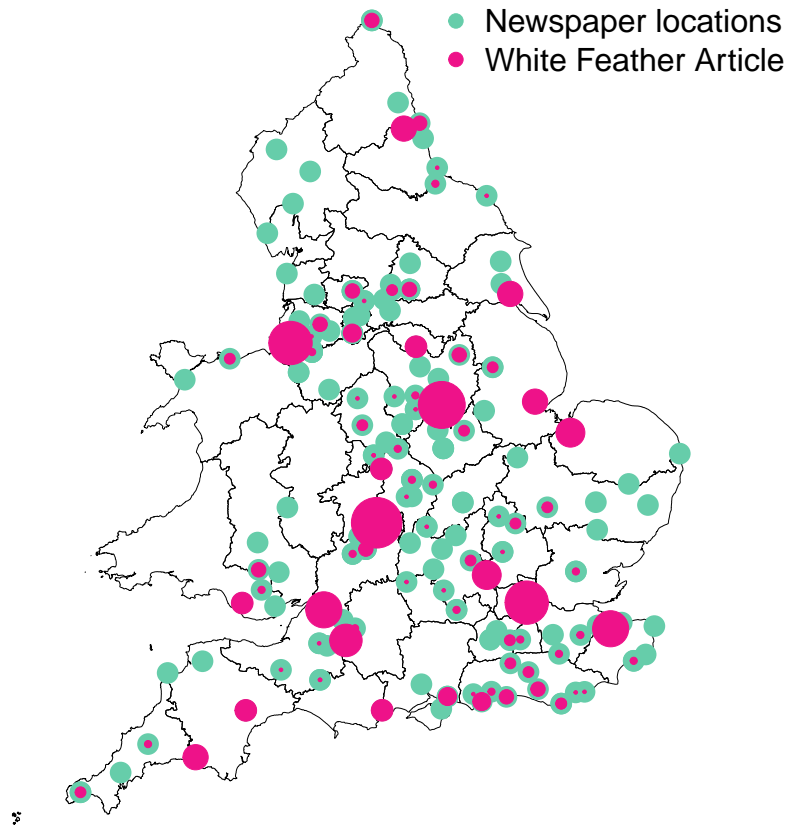
"Your special correspondent was not aware that accommodation for some 300 additional men, at an almost nominal rent of about 1s. 6d. a week, has been erected and is nearing completion, while the plans are out for accommodation for an additional 800 men. A messroom and bathrooms are being erected. Lighting and heating are being prepared for and will be included in the rent figure named. As regards the 'white feather' attacks on R.A.F. men, some 1,500 badges have been issued on loan to the employees by the factory against a deposit of one shilling (returnable should the badge be called for by reason of the employee's departure). This badge asserts that the men are serving their country at the R.A.F."

(b) Article on Intraduction of Badges

Note: Panel (a): Example of a newspaper article on the White Feather Girls from Wednesday 02 September 1914 published in the Yorkshire Evening Post. Found in The British Newspaper Archive ([britishnewspaperarchive.co.uk](http://britishnewspaperarchive.co.uk), subscription required). Panel (b): Example of a newspaper article discussing badges to allow men to signal employment in war-relevant industries and hence offer protection from the White Feather Girls. Published in The Daily Citizen on Friday 18 December 1914. Found in The British Newspaper Archive ([britishnewspaperarchive.co.uk](http://britishnewspaperarchive.co.uk), subscription required).



Figure C.5: Places of Publication and Number of White Feather Articles

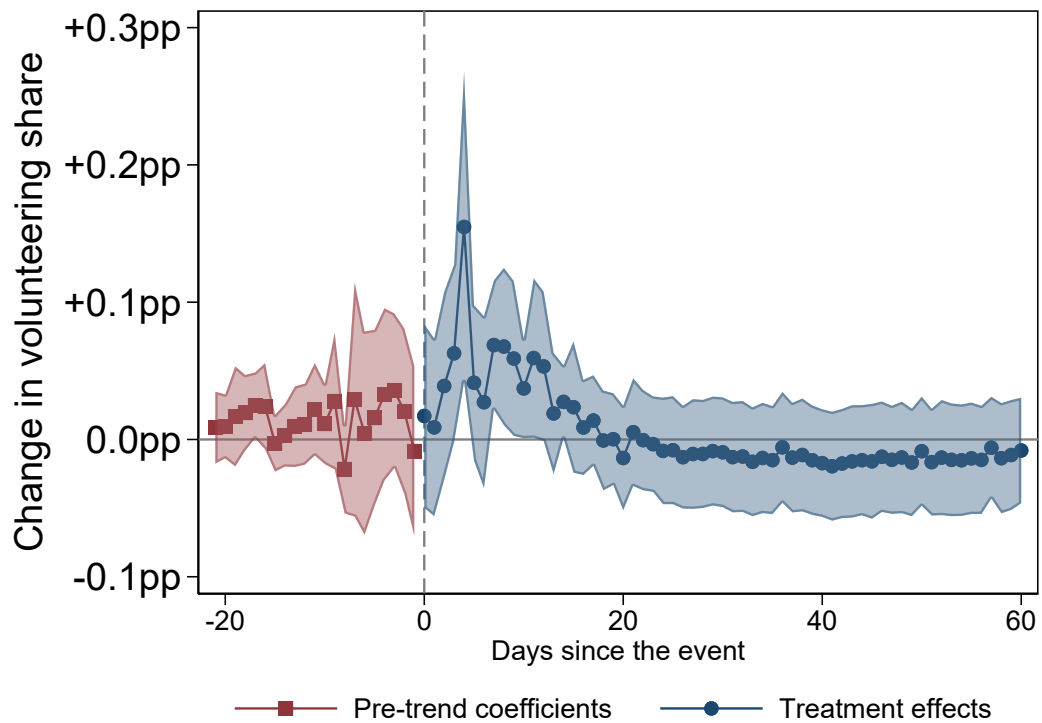


*Note:* The Figure shows the locations of all 253 local newspapers in the data (green dots) and the places where articles on the White Feather Girls were published (pink dots) weighted by the number of articles published in each newspaper between August 1914 and May 1915. The maximum number of articles published on the White Feather Girls by a single newspaper was 14.



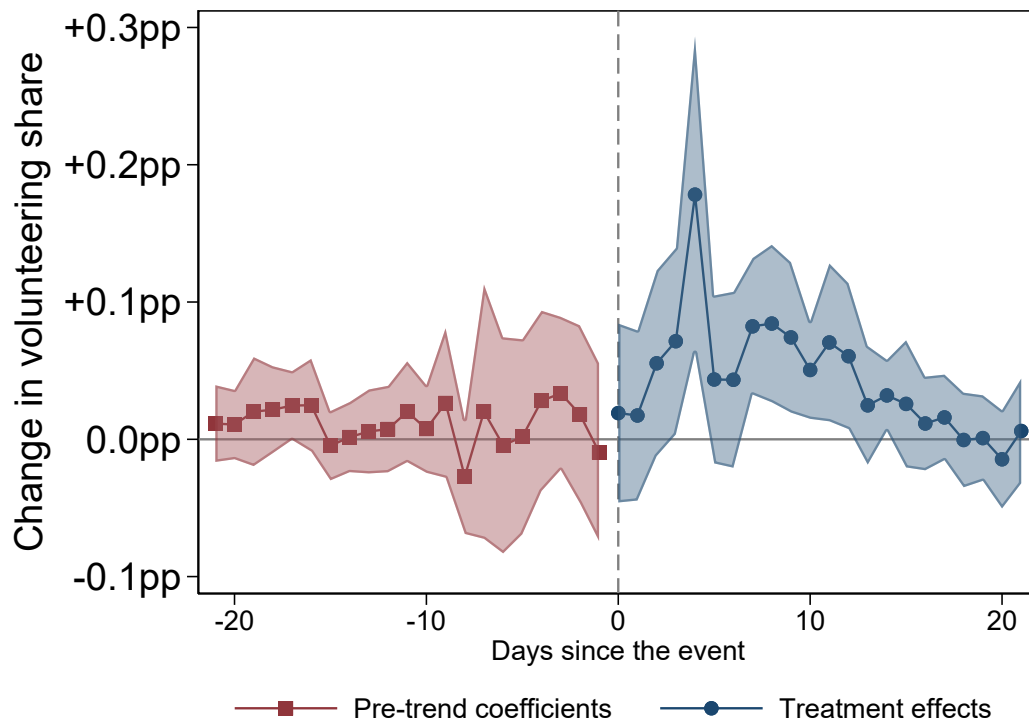
## D Additional Results

Figure D.6: Effect of White Feather Activity on Volunteering – Longer Horizon



*Note:* The graph shows the results for pre-trend testing (red squares) based on equation (3) and treatment effect estimation (blue dots) using the imputation approach for difference-in-differences designs proposed by Borusyak, Jaravel, and Spiess (2021). The shaded red and blue areas indicate the 95% confidence intervals for the estimates. The sample comprises all 121 recruiting cities. Effect and pre-trends are shown for three weeks around the event date which is set to two days before the publication date of an article. A city is defined as treated after it has been closest to a newspaper publishing on the White Feathers for the first time. The outcome of interest is the volunteering share defined as the number of daily volunteers divided by the number of recruitable men from the 1911 Census.

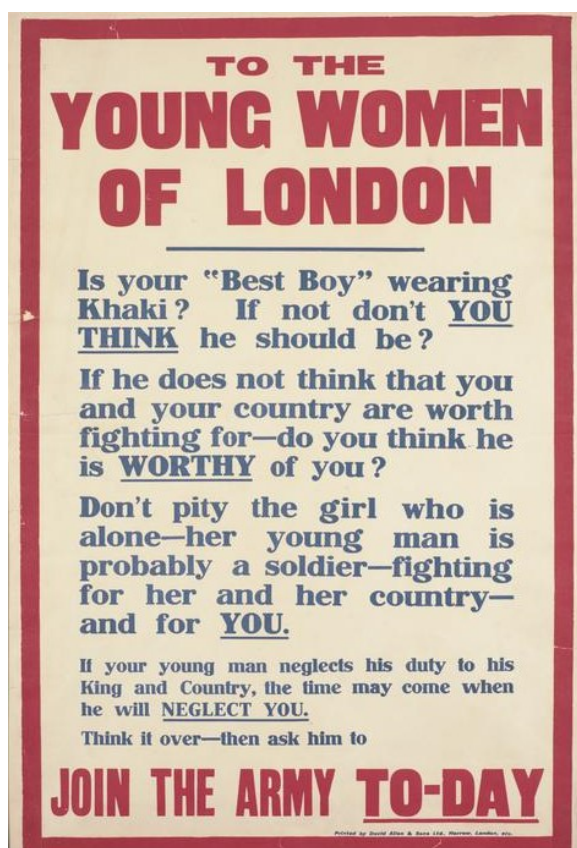
Figure D.7: Effect of White Feather Activity on Volunteering – Full Set of Controls



*Note:* The graph shows the results for pre-trend testing (red squares) based on equation (3) and treatment effect estimation (blue dots) using the imputation approach for difference-in-differences designs proposed by Borusyak, Jaravel, and Spiess (2021). The shaded red and blue areas indicate the 95% confidence intervals for the estimates. The sample comprises all 121 recruiting cities. Effect and pre-trends are shown for three weeks around the event date which is set to two days before the publication date of an article. A city is defined as treated after it has been closest to a newspaper publishing on the White Feathers for the first time. The outcome of interest is the volunteering share defined as the number of daily volunteers divided by the number of recruitable men from the 1911 Census. Controls include the daily share of articles within a radius of 50km around the recruiting cities falling into each of the five topics defined by the LDA as depicted in Figure (8). Topic 3 serves as the reference. I also control for negative sentiment measured as the daily share of articles dominantly associated with a negative emotion (anger, fear, disgust and sadness) within a 50km radius around the recruiting cities. Controls from the Census comprise the share of females, the share of the population born in another country, the share of young individuals in the population, the share of self-employed, the share of farmers and the share of those in paid employment. Casualties are the number of soldiers who died each day whose residence is in an area assigned to the respective recruiting cities. Information on soldiers who died come from the Naval & Military Press.

## E Government Efforts using Public Shaming

Figure E.8: Newspaper Article on the White Feather Girls



(a) PCR recruitment poster using female pressure



(b) PCR recruitment poster using children

Note: Panel (a): Recruiting Poster. Creator unknown. Printed by David Allen and Sons Ltd., Harrow, London. Production date: February 1915. Imperial War Museum, London. <https://www.iwm.org.uk/collections/item/object/28305>. Panel (b): Parliamentary Recruiting Committee, London. Poster No. 79. Designed and Printed by Johnson, Riddle and Co., Ltd., London, S.E.. Produced in 1915. Imperial War Museum, London. <https://www.iwm.org.uk/collections/item/object/17053>.