The 'Superwoman Effect' of Female Representation in Animated Series on Gender Roles and Educational Achievements [*]

Oleksandra Cheipesh[†]; Warn N. Lekfuangfu[‡]

August 2025

Abstract

To what extent does representation in mass media content influences gender-related perceptions of children and their later-life achievements? This study examines how childhood exposure to female-led superhero animated series shapes educational choices and gender stereotypes. We leverage two sources of variation: the signal coverage of the TV channel broadcasting these cartoons across areas in Ukraine in the early 2000s, and the duration of exposure to these cartoons during childhood. We find that girls who had access to cartoons with strong female leads have higher educational attainments. They are also more likely to pursue STEM subjects, and have more internal locus of control. Additionally, for both sexes, we have evidence of a decline in traditional gender stereotypes.

Keywords: gender representation, gender roles, child media, cartoon, educational attainment, Ukraine.

[†]Universidad Carlos III de Madrid; e-mail: ocheipes@eco.uc3m.es
[‡]Universidad Carlos III de Madrid, IZA, J-PAL; e-mail:nlekfuan@eco.uc3m.es

1   Introduction

Mass media is a powerful tool for communication. Not only does it inform the viewers, but it also has a profound influence on shaping societal beliefs, attitudes, and stereotypes (DellaVigna and La Ferrara, 2015; La Ferrara, 2016; DellaVigna and Gentzkow, 2010). Through repeated exposure to particular narratives, imagery, and representations, individuals internalise the norms and values presented by media. This makes television and radio programmes a critical force in shaping societal frameworks and personal identities, particularly for the young audience (Banerjee et al., 2019; Ang, 2023; Armand et al., 2024).[1]

Therefore, representation in the media, including cartoons, is a crucial factor in influencing self-perception, career aspirations, and understanding of contemporaneous social norms, particularly for young audiences (Bandura et al., 1986, Leaper, 2014). Specifically, the under-representation or stereotypical portrayal of female characters in children's media reinforces traditional gender roles, which can constrain ambitions and self-esteem, particularly among girls (England et al., 2011).[2]

Exposure to positive role models can raise participation and performance in traditionally underrepresented fields. Early exposure to diverse role models helps to dismantle social barriers that limit labour market participation and economic advancement for women (Beaman et al., 2012; Goldin, 2014; Riley, 2024). Therefore, integrating female characters in children's animated series or cartoons that exhibit characteristics that are typically masculine (e.g., athletic, brave, high agency) can subtly encourage girls to envision themselves in leadership roles, STEM fields, or

---

[1]Additionally, there is another large body of work that looks at the direct effect of time spending on educational-base mass media (television and radio) on educational outcomes. See, for instance, Gentzkow and Shapiro (2008); Kearney and Levine (2019); Keefer and Khemani (2011).

[2]In a much related work, Adukia et al. (2023) provide recent evidence on under-representation of females and ethnic minorities in books and literature across collections and over time.

other underrepresented areas. By normalizing these portrayals, cartoons not only foster confidence and ambition among girls, but also contribute to broader societal progress by challenging traditional gender dynamics.

In this paper, we examine the later-life implication of childhood access to animated series with female leads who demonstrate traditionally masculine characteristics (the so-called 'superwoman'). We evaluate the outcomes among male and female adults in different dimensions, including educational achievements, socio-emotional skills, and their views on gender roles. Our causal identification leverages the early limitations in television broadcast coverage and its subsequent evolution, which determined the level of exposure to mass media content among Ukrainian children from different birth cohorts and county of residence.[3] Specifically, we exploit the timing of the arrival of the *New Channel* (NC textithereafter), which increased available content options and, for our study, provided animated series with strong female leads. Due to the limited availability of broadcast spectrum, NC, after its first transmission in Kyiv in 1998, was only gradually granted licenses to expand its network to other parts of Ukraine. By 1999, the channel was available in six Ukrainian states, but by 2010, only around 70% of Ukraine's population had access to it. Nevertheless, animated series featuring *superwoman* content only became part of the channel's regular programming in 2000. Therefore, our analysis will consider 2000 as the first year of potential access to female-led cartoon content

Consequently, depending on their place of residence, Ukrainian children gained access to NC and its animated series at different ages. Therefore, based on the variation in the first age of access for Ukrainian children across different counties, our difference-in-differences approach estimates the effect of exposure to animated series with *superwoman* content. Additionally, since girls are the primary target

---

[3]Unlike many other European countries, television networks in Ukraine before 2000 were relatively underdeveloped – with limited child media content. In 1990, Ukrainian households had access to only three national channels, all of which primarily targeted an adult audience. By 1998, the broadcast of animated series was minimal – approximately 65 minutes daily (two to three carton shows during weekdays).

audience for these series, we also conduct a triple-differences estimation, using boys of the same age group residing in the same county as an additional control group.

Among the complete pool of children's animated series listed in Ukraine's daily television guide during our analysis period (1996 to 2007), we classify a series as *superwoman* type if it meets the following criteria: sufficient female representation[4]; and leading female character(s) portrayed with positive but stereotypically masculine traits, which are high agency, leadership, and bravery (England et al. 2011).

The classification was initially performed with the help of generative AI tools, and subsequently cross-checked by human classifiers. In summary, the total number of minutes of female-led cartoons in 1996 was 15 minutes per week. The average annual number of minutes of female cartoons during was 84 minutes per week whereby 76.4 % of all the female-led cartoons on television were shown on NC. Given that the typical target audience for animated series consists of children in kindergarten and primary school (i.e., 3 to 10 years old), we construct two variables to measure their exposure at both the extensive and intensive margins during childhood as follows: (i) an indicator of whether an individual had any access to superwoman-type animated series between the ages of 3 and 10; and (ii) the total broadcast duration (in minutes) of all superwoman-type animated series for each year of childhood.

To estimate the long-term effects of the female superhero animated series, we draw upon several datasets. For individual-level educational attainment, we use the Ukrainian Longitudinal Monitoring Survey (LUMS) as the main dataset. LUMS is a nationally representative dataset of individuals residing in Ukraine, collected in 2003, 2004, 2007, and 2012. Information on college fields of study and whether an individual pursued a STEM field primarily comes from the 2012 wave, which collected data on university enrolment status. Additionally, LUMS includes measures of personality and socio-emotional skills, including a proxy for internal locus of control. Attitudes towards gender roles are drawn from the 2020 European Values

---

[4]Relevant metrics include the Bechdel Test and Mako Mori Test

Study (EVS).[5]

Our main finding highlights that women exposed to cartoons with strong female leads during childhood have higher educational attainment and a stronger internal locus of control compared to those without access to such media. These effects are particularly pronounced for women born in villages. Additionally, childhood exposure to female-led cartoons appears to encourage women whose mothers were low-skilled to pursue STEM studies in college. Specifically, a one standard deviation increase in minutes of female-led cartoon content is associated with a 10.8 percentage point increase in university enrolment among the female sample. In contrast, the overall effect of superwoman animated series on educational outcomes is small and statistically insignificant for the male sample. Moreover, our difference-in-differences estimations reveal a positive effect of superwoman programmes on internal locus of control. The estimates suggest that exposure to superwoman cartoons increases internal locus of control among females by 7.2 percentage points. No significant effects are found for men, as the estimates are small and statistically insignificant.

One pathway through which an access to positive depiction of female characters in children's media can have a real impact on educational outcome can be through its influence on attitudes towards gender roles. Indeed, we provide supporting evidence that childhood exposure to cartoons with strong female leads reduces traditional attitudes towards gender roles among both male and female samples. Specifically, there is a decline in the belief that men make better political leaders and executives, as well as in the preference for prioritising the education of boys over girls. In contrast, we find little evidence of its impact on attitudes regarding family-related

---

[5]The European Values Study (EVS) is a large-scale, cross-national, repeated cross-sectional survey research programme on basic human values. The dataset is stored at GESIS, Leibniz Institute for the Social Sciences). The exact questions we use to compute our measures of gender-related attitudes are: (i) men make better business executives than women; (i) men make better political leaders than women; (iii) university education more important for a boy than for a girl; (iv) man's job is to earn money; woman's job is to look after home and family; (v) child suffers with working mother; (vi) family life suffers when woman has full-time job.

4

stereotypes, such as the belief that a mother's primary responsibility is to care for the family at home.

As a robustness check, to ensure that the effects of childhood exposure to animated series on educational attainment and gender role stereotypes are not driven by a natural evolution of views over time, we conduct a cohort-based event study. First, we find that changes in the outcomes occur among cohorts exposed to the series before the age of 11. More importantly, this analysis provides supporting evidence of no pre-existing trends.

This paper is outlined as follows. Section 2 discusses related literature and institutional background of the Ukrainian educational system and television broadcast. Section 3 describes the datasets and Section 4 outlines our estimation design. Section 5 presents the main results and Section 6 concludes.

2 Background

2.1 Literature Review and Contribution

This study adds to the existing research on the determinants of gender roles and female aspirations. Prior literature has explored the impact of both historical factors, such as wars (Goldin and Olivetti, 2013; Fernández et al., 2004; Gay, 2023), deportations (Miho et al., 2024), agricultural practices (Alesina et al., 2013), and frontier experiences (Bazzi et al., 2023), as well as contemporary developments, for example, female leadership (Beaman et al., 2012), information diffusion (Fogli and Veldkamp, 2011), and economic shifts (Lekfuangfu and Lordan, 2023). By examining the effects of exposure to animated series, this paper underscores the multidimensional nature of stereotype and gender role formation.

The impact of mass media on women's outcomes has been studied mainly in the context of exposure occurring in adulthood. By investigating the introduction of

cable television in India, Jensen and Oster (2009) finds that it is associated with a decrease in fertility and gender-based violence. The relationship between media and fertility is also reported by Ferrara et al. (2012) who exploit soap operas featuring small families in Brazil. Additionally, Okuyama (2021) shows that radio programmes propagating the dismantling of patriarchal norms in Japan had a positive effect on women's electoral turnout and a negative effect on fertility. Related to this, Riley (2024) demonstrates an immediate impact of watching a movie with a positive female role model on educational attainment. Similarly, our work shows that exposure to positively portrayed characters in mass media can have long-term consequences on educational outcomes. Additionally, our findings on gender-related attitudes contribute to the existing body of literature demonstrating the long-term influence of mass media in other areas, such as racial views (Ang, 2023, Armand et al., 2024, Duquennois and Zeng, 2024), career decisions (Kearney and Levine, 2019), family choices (Ferrara et al., 2012, Kearney and Levine, 2015), and attitudes (Hennighausen, 2015, Bursztyn and Cantoni, 2016).

2.2 Background on Television Networks in Ukraine and New Channel

The development of television network in Ukraine was slow compared to other European countries. While the first television center in Ukraine was established in 1951, only in 1965 that the first Ukrainian channel, *Ukrainian Television* (UT-1), emerged. UT-1 broadcasted mainly news, reality programmes, and documentaries. Before the fall of the Soviet Union, television networks in Ukraine were highly limited. Although several other channels arrived in the 1990s, the majority of their content was tailored for adult viewers. Animated series for children accounted for only around 8% of total broadcast time - with just over 2% featuring strong female leads (see Appendix Table A.4).

The New Channel (NC) entered the market in July 1998. However, due to regulations set by the National Council of Television and Radio Broadcasting of Ukraine (NCTR), NC was unable to broadcast nationwide immediately. The channel's expansion was primarily constrained by the limited availability of broadcast spectrum. As a result, its expansion depended on when the NCTR periodically announced tenders for available TV transmitters across Ukraine. The winner of each tender gained the right to use the transmitter and, subsequently, to broadcast a TV signal within a specific radius.[6]

The NCTR has records of all licenses issued for the New Channel, which contains the year and the location of each issued license, including the detail on the counties that received the signal from a given transmitter. Accordingly, Figure 1 shows the expansion of signal coverage of NC across Ukraine throughout the years.[7] Each blue dot represents a location of the TV transmitters in a give calendar year. The shaded counties (in teal) are those areas that received the TV signal from those transmitters. In 1999, NC had reached six Ukrainian states. While it became available in all states by 2004, by 2010 only 70% of Ukrainians had access to its broadcast. By that time, NC had secured the third-largest audience share and rating among viewers aged 18-54.[8]

2.3 Education System in Ukraine

The educational structure in Ukraine consists of compulsory primary and basic secondary education, followed by an optional track thereafter (see Appendix Figure

---

[6]The radius of signal coverage depends on several factors, such as the height of the antenna, its frequency, and whether the area is mountainous or not.

[7]Since the records on the timing of licenses only started in July 2001, we supplement it with another dataset from the website of *TV and Radio Broadcasting in Ukraine* for earlier years.

[8]See Appendix Figure A.1. Its viewership continued to rise until 2011. It's important to note that viewership is measured by the percentage of households actively watching television at a given time and tuned to a specific station, while a channel's rating is derived from the percentage of all TV households tuned to that station.

Figure 1. Channel Expansion

1999

2001

2004

2010
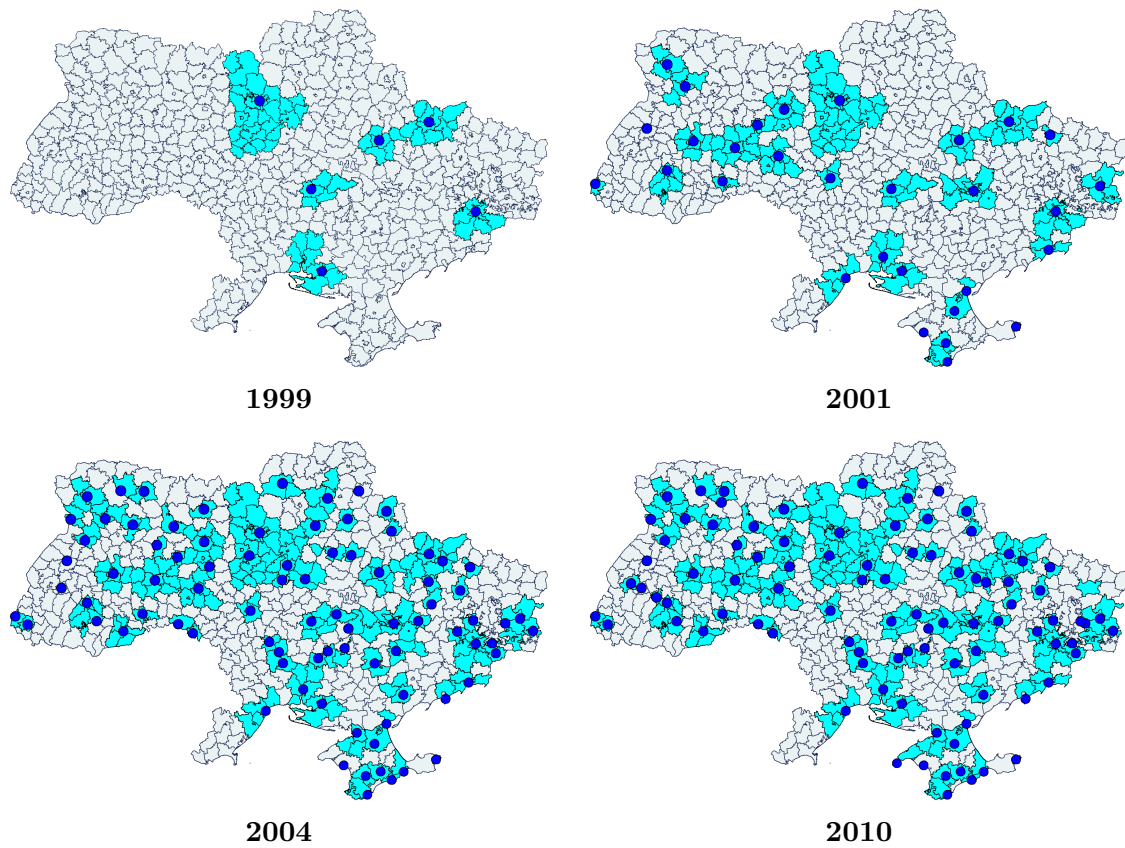
Notes: Based on the data from the National Council of Television and Radio Broadcasting of Ukraine. Each blue dot indicates a location of the TV transmitters. The shaded counties (in teal) are those with coverage of the NC's signal.

A.2).

The starting age of schooling in Ukraine has changed over the years. Before the 1986 reform, the school starting age was 7 years old. After 1986, it was lowered to 6 years old. Nevertheless, some children may start school one year before or after – depending on the month of birth.

Primary education lasted three years until 1986, after which it was extended to four years. Basic secondary education remained five years throughout the observed period.[9] After completing basic secondary education, students can continue to a 3-year higher secondary education, either at a general school or through vocational training. Regardless of the chosen track, all students have the option to pursue higher education at a university, which takes 4 years, and may be followed by a Master's degree or PhD.

3 Data

3.1 Measures of exposure to cartoons with strong female leads

We define an individual' level of exposure to animated series with strong female leads during their childhood in two ways.

First, we have a measure of exposure at the extensive margin. An indicator variable equals 1 if an individual resided in a county that received the transmission of NC and its superwoman-type animated series during their childhood, defined as ages 3 to 10.[10] The age range corresponds to kindergarten and primary school

---

[9] A law introduced in 2018 raised the compulsory education to 11 years of schooling.

[10] Refer to Section 2.2 for the detail on geographical and temporal expansion of the network of NC and its broadcast content. Since the NCTR began collecting data on the year a county received the NC transmission after July 2001, we use data from TV and Radio Broadcasting in Ukraine to cover earlier periods. This source was developed by volunteers, with information typically provided by residents of the respective counties based on personal knowledge. Additionally, data on channel expansion in 1998 and 1999 are available on the

age groups in Ukraine. The county of birth is used as the proxy for the county of residence during the childhood ages. Additionally, we can construct a set of dummy variables to indicate whether an individual had access to NC content at a specific childhood age.

Second, we also construct a measure of exposure at the intensive margin. Specifically, we calculate the total broadcast duration (in minutes) of all superwoman-type animated series for each year of childhood. Additionally, we construct a variable that sums the total exposure time to the series throughout the entire childhood. To do so, we draw from the archive of Ukrainian TV guides that lists each broadcast programme and its showtime for each day of the week, in a given week.

For each animated series program, we begin our classification by gauging how female characters are represented in a cartoon, we employ two criteria: (i) whether it passes the Bechdel Test and Mako Mori Test, which indicate whether a cartoon has sufficient female representation, and (ii) whether the lead characters are female. In the next step, we assess how female characters are portrayed. Specifically, we examine whether they exhibit a set of positive but stereotypically masculine traits, which are strong leadership, bravery, and agency. Therefore, a cartoon is classified as a superwoman type if it features female lead(s) who sufficiently demonstrate these traits.[11] Table A.3 shows the classification of all the cartoons that aired on Ukrainian TV between 1996 and 2007.

In the robustness checks, we modify some of the classification criteria for superwoman-type cartoons. In Option 1, a cartoon qualifies if it features a leading female character who *constantly performs rescues*, is brave, and has agency. Option 2 requires for cartoons to have a leading female character who *occasionally performs rescues*,

_____

New Channel's website. If a specific year is missing from all sources, but it is confirmed that the county received the NC signal by 2001, the year is set to 2001.

[11]A cartoon is considered to have sufficient female representation if it passes both tests. Our classification process leverages generative AI to make these assessments. By using generative AI ten times some cartoons had ambiguous results for sufficient female representation, meaning that several times the same cartoon was classified as passing the tests, while other times as failing.

is brave, and has agency. Option 3 includes cartoons where females are *sufficiently represented*, perform rescues, are brave, and have agency. Lastly, Option 4 requires that females are sufficiently represented, are brave, and have agency, but without the rescue criterion.

Then, for each year, we calculate the duration of showtime (in minutes) of superwoman cartoons. First, we count the total showtime in the first week of each month. In general, the weekday and weekend programmes are different.[12] Figure 2 shows the evolution of the broadcast of all animated series and superwoman-type animated series by NC and other channels. In the early 2000s, NC broadcast 50% of all animated series and around 76% of superwoman-type animated series (based on our main classification of superwoman cartoons).[13] Moreover, Appendix Table A.4 shows that, while children's programmes continued to account for approximately 8% of total showtime after the arrival of NC, their content shifted towards Western-style programming. Most importantly, the share of superwoman content rose from less than 3% of the total animated series showtime in 1999 to nearly 20% by 2007.

3.2 Longitudinal Ukrainian Monitoring Survey

To investigate the effects of female superhero cartoons on educational attainment, we use data from the Longitudinal Ukrainian Monitoring Survey (LUMS). The LUMS is conducted on both individual and household levels and contains detailed information on respondents' demographic characteristics including the year and place of birth at the second administrative division level (i.e., *raion*, which is equivalent to a

---

[12]In detail, for weekdays, we assume that Monday's programmes are repeated until Friday. Therefore, we multiply the minutes of the relevant cartoons on Monday by five. Next, we add the minutes of the relevant cartoons aired on Saturday and Sunday to obtain the total number of minutes for the first week of each month. To calculate the average annual content, we first determine the average weekly content per year by summing the minutes from the first week of each month and dividing by 12. Finally, we multiply this average weekly content by 52 to estimate the total number of minutes per year.

[13]Moreover, Appendix Figure A.3 shows that independently of the classification of the superwoman cartoons, NC was the main channel that broadcasted these types of animated series.

Figure 2. **Minutes of Animated Series**

A: All Animated Series   **B:** *Superwoman* **Animated Series**
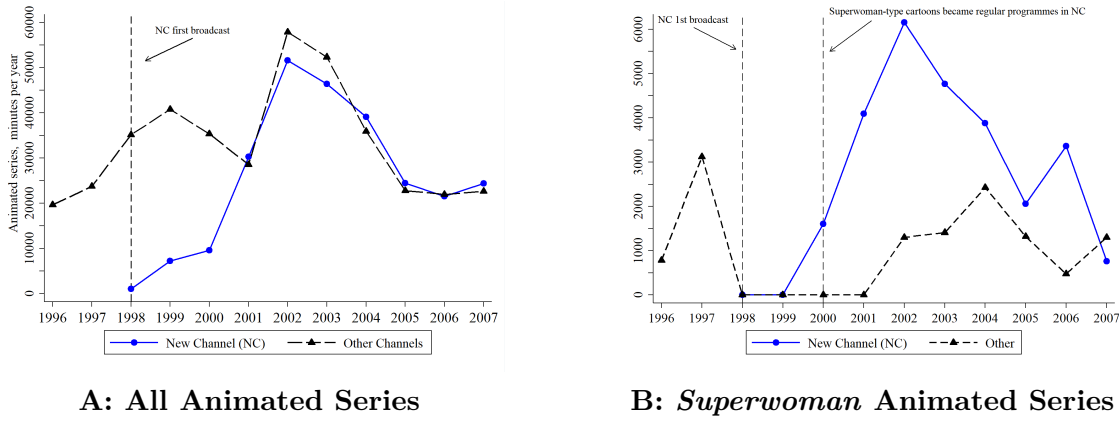
The figures are based on information from Ukrainian TV guides between 1996 and 2007. Content showtime is calculated using programmes from the first week of each month and subsequently summed for the given calendar year.

county), educational attainment, and parental background. The survey is collected across multiple waves (2003, 2004, 2007, and 2012) where each survey wave consists of both a longitudinal sample and first-time respondents. We investigate three outcomes from the LUMS: university enrolment, studying STEM, and internal locus of control. The LUMS asks respondents about their highest educational attainment in all the waves. However, the information on the field of study (at university or college) and internal locus of control are available only in the 2012 wave. Thus for the main analysis, we focus on the 2012 wave.

We start with the initial sample of 7,122 individuals. Then, we restrict the sample so that the core analysis sample of 6,424 consists of Ukraine-born respondents whose county of birth is observed.[14] To study the effects on university enrolment, we further restrict the sample to individuals who have completed at least 12 years of schooling at the time of the survey. This threshold is based on the fact that, after completing

---

[14]We identify county of birth in two ways. First, it comes directly from the question on the county of birth. Second, when the county of birth is missing, we exploit another set of questions on the settlement of birth and state of birth. Note also that the state of birth is necessary when there are two or more counties with a common name. Out of 7,122 respondents, 6,424 respondents meet the following criteria (622 were born outside Ukraine while the county of birth is missing for 76 other respondents).

basic secondary education, students can either pursue upper secondary education (two years) or vocational education (three years). For our analysis on STEM, we further exclude individuals who did not attend university, as their field of study is not available in the survey.

We construct the variables on educational attainments in the following ways. The main variation on university enrolment equals 1 one if (i) a respondent's highest educational attainment is at least a bachelor's degree; or (ii) they attended a university but later dropped out. Equally, for those with the former USSR's educational system, we classify them as having university education if they completed higher education (even without the specification of the diploma). Furthermore, we consider a respondent to have a STEM field of study from either their current or their completed degree, using primarily the information stated in the 2012 wave.[15]

A measure of locus of control is constructed from the following questions: 'Do you think about how the things you do will affect others?', and 'Do you think about how the things you do will affect you in the future?'. We classify respondents as having an internal locus of control (i.e., believe that their actions have an impact on others or the future) when they answer 'almost always' to both questions.[16]

Appendix Table A.1 present summary statistics of males and females in our analysis sample. Respondents who had access to the superwoman cartoons in their childhood differ notably from their counterparts. *Treated* individuals are more likely to be enrolled in university, and study in a STEM field. In terms of their background, they are more likely to come from villages and are of lower socio-economic status

---

[15]In detail, there are 14 fields of study at the university and 15 fields of study in the college in the survey. In our analysis, STEM fields of study are business administration, accountancy, commerce, retail shop management, economics, etc; science, mathematics, computing, etc; other technical and engineering, including architecture, industry, craft, building trades, etc; information technology (e.g., computer software, database, programming, networking); other engineering, science or architecture.

[16]In addition, the LUMS also has a measure of Big-Five personalities. Our estimations also check for the effects of superwoman animated series on these behavioural measures. See Appendix Tables A.5 and A.6 for the results.

(parents with low education, who worked in low-skilled or unemployed). We suspect that some of these differences are driven by the difference in birth cohorts and the age-at-interview. Throughout the analysis, we will account for these differences with cohort fixed effects in the regressions.

3.3 European Value Survey

To examine the impact of female superhero cartoons on gender stereotypes, we use data from the 2020 European Values Survey (EVS). The EVS is a repeated cross-sectional survey that collects information on preferences and beliefs across Europe. It includes data on respondents' demographic characteristics and attitudes toward gender norms.

The full sample contains 1,614 observations. The working sample excludes respondents who were born outside Ukraine. We construct binary variables equals one if a respondent indicates either 'agree' or 'agree strongly' to the following statements: 1) men make better political leaders; 2) men make better executives; 3) university is more important for a boy; 4) it is a man's job to earn money; 5) a child suffers if the mother works; and 6) the family suffers if the mother works. Since the EVS only provides information on the state at which the interview was conducted, we assign the treatment variables based on the share of the state that received a signal to the New Channel during respondents' early childhood. In 1999, NC was present in six states, while in 2002 at least one county in all the states in Ukraine received a signal to NC with the median population-weighted coverage in states reaching around 54%. This share remained relatively stable for a long time. In 2010 the median coverage in the states was around 58%.

Appendix Table A.2 shows the descriptive statistics by sex. Half of the respondents of both sexes reside in small towns and a quarter of the respondents have parents who obtained only basic secondary education. Both men and women in Ukraine tend to believe in traditional gender roles but these beliefs are stronger

14

among men. Around half of male respondents and one-third of female respondents think that men are better political leaders and executives and roughly half of both men and women feel that it is a man's job to earn money and that family may suffer with a working mother.

4   Estimation Design

Our main identification strategy leverages variation across birth cohorts and location (counties) in individuals' potential exposure to superwoman animated series in their childhood. We focus on individuals who potentially had access to the cartoons during their kindergarten and primary ages (3-10 years old). Given that the broadcasting of superwoman animated series in Ukraine began in 2000, individuals born after 1990 are the treated cohorts (aged 10 years or younger in 2000). On the other hand, those born before 1990 (aged 10 or more by the year 2000) would have been too old to be the main target audience for children's programmes.[17]

To estimate the effect of female superhero cartoons on educational outcomes, our identification strategy is based on a cohort difference-in-differences design and is outlined in Equation 1 as the following:

$$Y_{ijc} = \beta_0 + \beta_1 \, \text{SW}_{ijc} + \beta_2 \, X_{ij} + \gamma_j + \delta_c + \varepsilon_{ijc} \tag{1}$$

where Y_{ijc} is an outcome variable of an individual i, born in county j, belonging to cohort c. The vector X_{ijc} are a set of individual-level control variables such as parental educational attainment and occupation, nationality, rural status of a place of birth, presence of parents during childhood, the number of younger and

---

[17]Since LUMS was conducted in 2012 and the sample includes individuals aged 15 or older, the treated cohorts in this survey were born between 1990 and 1997, and the control cohorts were born between 1939 and 1989. On the other hand, since EVS was conducted in 2020 and the sample includes individuals aged 18 or older, the treated cohorts were born between 1990 and 2002, and the control cohorts were born between 1937 and 1989.

older brothers and sisters, and financial status during childhood. Finally, γ_j and δ_c denote county-of-birth and cohort fixed effects, respectively.

We estimate the effect of exposure to superwoman series (β_1) in two ways. First, the extensive margin of the exposure to superwoman series, SW_{ij}^{ex}, is constructed from $\text{SW}_{ij}^{ex} = \max_{s \in \{2000,2007\}} \left\{ \text{broadcast}_j^s \times \text{young}_i^s \right\}$ where broadcast_j^s is an indicator equals 1 if a county (j) had access to the NC's network and its animated series content at a given year (s), and young_i^s equals 1 if the individual (i) is 3 - 10 years old in that year. That means, if an individual was ever young enough at some point during the broadcast of superwoman series, they are considered treated under this specification.

Alternatively, we can focus on the intensive margin of the exposure (SW_{ij}^{in}) by calculating the total duration of superwoman shows (measured in minutes) an individual potentially had access to during their childhood. Thus, $\text{SW}_{ij}^{in} = \sum_{s=2000}^{2007} \left(\text{broadcast}_j^s \times \text{young}_i^s \times \text{mins}^s \right)$ where mins^s is the total duration of superwoman cartoons (in minutes) in a given year.

In the next exercise, to better account for the validity of the common trend assumption – the fact that individuals residing in counties with early and later exposure to the expansion of NC and its superwoman programs may not have experienced similar changes over the years, we turn to the triple differences design (DDD). Based on a conjecture that girls are more likely than boys to be the target audience of superwoman animated series, our DDD then compares females to their equivalent males who were born in the same county and from the same birth cohort. Precisely, in Equation 2, we interact the dummy variable for female (f_i) with the main treatment variable, SW_{ij}, and the country and birth cohort fixed effects. Therefore, θ_2 now captures the effect of exposure to the cartoons.

$$Y_{ijcf} = \theta_0 + \theta_1 \, \mathrm{SW}_{ij} + \theta_2 \, \mathrm{SW}_{ij} \times \mathrm{f}_i + \theta_3 \, X_{ijc}$$
$$+ \, \gamma_j + \delta_c + \gamma_j \, \mathrm{f}_i + \delta_c \, \mathrm{f}_i + \varepsilon_{ijc} \tag{2}$$

Next, we turn to a cohort-based event study, which allows for potential heterogeneity arising from the timing of an individual's first exposure to superwoman-type animated series. Specifically, Equation 3 estimates the effect of the earliest age of exposure and compares its magnitude across the age spectrum.

Let SW_{ij}^a be a dummy variable that equals 1 when an individual i who lives in county j had access to superwoman-type animated series for the first time at age (a) years old. Due to the sample size in the survey, we decide to group a into age ranges as: 3-6, 7-10, 11-15, 16-20, 21-25, 26-30, 31-35, and 35+ years old – with the 11-15 years old be the reference group in the analysis. Therefore, π_{3-6} and π_{7-10} are the main coefficients of interest. Furthermore, the estimation also allows for the evaluation of the presence of pre-trends from the estimation of the effect among those who were exposed to superwoman cartoons at older ages.

$$Y_{ijc} = \alpha_0 + \sum_{a=(3-6)}^{\geq 35} \left(\pi_a \times \mathrm{SW}_{ij}^a \right) + \alpha_1 \, X_{ijc} + \gamma_j + \delta_c + \varepsilon_{ijc} \tag{3}$$

5 Main Results

We start our analysis with investigating the effect of childhood exposure to NC on individual outcomes. Table 1 shows the estimated coefficients for Equation 1. The results suggest that signal to the NC during childhood has a positive effect on university enrollment and locus of control for females. Childhood exposure to NC is associated with a 14.7 pp. and 9.7 pp. increase in female university enrollment and locus of control, respectively. The triple difference estimates also suggest that the effects of childhood exposure to NC are stronger for females, but the estimates

are relatively noisy.

Next, to examine whether estimates are not driven by the natural evolution of female outcomes over time, we examine a cohort-based event study described in Equation 3. The findings in Figure 3 provide little evidence of pre-trends.

To investigate the effect of the intensive margin of exposure to superwoman-type animated series, we estimate the effect of the standardized minutes of the broadcast of these cartoon shows. We focus on the animated series that has a female character who is a strong leader with traditionally masculine qualities. The impact of minutes of exposure to superwoman-type series defined by alternative measures is shown in the Appendix. Table 2 shows that a one standard deviation increase in the minutes of the broadcast of a superwoman-type animated series increases university enrollment and locus of control among females by 10.8 pp. and 7.2 pp, respectively. Unlike exposure to NC, the minutes of the broadcast of a superwoman-type animated series appear to have no effect on men. Moreover, triple difference estimates for females are of the same magnitude as estimates obtained with a difference-in-difference specification.

Exposure to non-traditional gender roles in media may have larger effects on those children who are growing up in more traditional families. To examine this hypothesis, we study the heterogeneity effects of exposure to superwomen-type animated series. Figure 4 presents the estimated effect of the accumulated minutes of exposure to these animated series by demographic characteristics: education and occupation of the respondents' mother and rural status of the place of birth. The estimates suggest that the effects on university enrollment are homogeneous among these demographic groups. However, the impact of exposure to the superwoman-type animated series on pursuing STEM studies is larger among females whose mothers are low-skilled or unemployed and among those who were born in villages. A one standard deviation increase in the broadcast of these cartoon shows appears to increase the likelihood of pursuing STEM studies for females with a low-skilled

18

mother by five percentage points. Similar results are shown for those females who were born in villages.

Tables 3 and 4 show the effect of the broadcast of a superwoman-type animated series on gender stereotypes. As mentioned before, EVS does not provide information on the county of birth. Thus, we report the estimates of the interaction between the share of the state that received a signal to NC when respondents were below ten with the minutes of the broadcast of a superwoman-type animated series. The treatment variable is standardized. The findings suggest that the broadcast of superwoman-type animated series decreases occupation-related gender stereotypes among both sexes but has no effect on family-related stereotypes.

6   Discussion and Conclusion

Gender representation in mass media may affect gender stereotypes. However, it is unclear whether the effects of TV content on children, while noticeable in the short term (Riley, 2024), translate into long-term changes. This paper examines the impact of childhood exposure to animated series featuring females with positive but traditionally masculine qualities on university enrolment, pursuing studies in STEM, and gender stereotypes in Ukraine.

Using two sources of variation: the signal coverage of the TV channel broadcasting these cartoons and the duration of their broadcast during childhood, we find that access to cartoons with strong female leads has a positive effect on educational attainment and internal locus of control among females. Furthermore, childhood exposure to such cartoons encourages females with low-skilled mothers to pursue STEM studies in college or university. In contrast, we find no significant impact on these outcomes for males.

Our findings suggest that a mechanism through which these animated series affect female outcomes is through a change in traditional gender stereotypes. Specif-

ically, childhood exposure to cartoons with strong female leads reduces occupation-related gender stereotypes in both sexes.

Table 1. New Channel Arrival and Individual Outcomes

	(1) Females	(2) Males	(3) Triple Difference
Panel A: University enrolment			
NC	0.182***	0.037	0.145
	(0.068)	(0.070)	(0.103)
Mean of D.V.	0.284	0.243	0.265
Observations	3,205	2,550	5,755
Panel B: Studying STEM			
NC	0.032	0.067	-0.034
	(0.059)	(0.072)	(0.094)
Mean of D.V.	0.272	0.288	0.280
Observations	2,499	2,150	4,649
Panel C: Locus of Control			
NC	0.043*	-0.018	0.061*
	(0.023)	(0.027)	(0.036)
Mean of D.V.	0.737	0.678	0.709
Observations	3,384	2,719	6,103

Notes: The data come from the LUMS. The estimates are obtained with a two-way fixed effects OLS model. The dependent variables are university enrollment, studying STEM fields, and locus of control. NC denotes the treatment variable that measures childhood exposure to NC after it started to regularly broadcast female superhero animated series (i.e, after 1999). The controls include parental educational attainment, parental occupation, presence of parents during childhood, economic situation at the age of 15, rural status of the place of birth, nationality, the number of younger and older brothers and sisters, and language spoken at daily life.
* statistically significant at the 10% level; ** at the 5% level, *** at the 1% level

Figure 3. **New Channel Arrival and Female Outcomes: Cohort Event Studies**
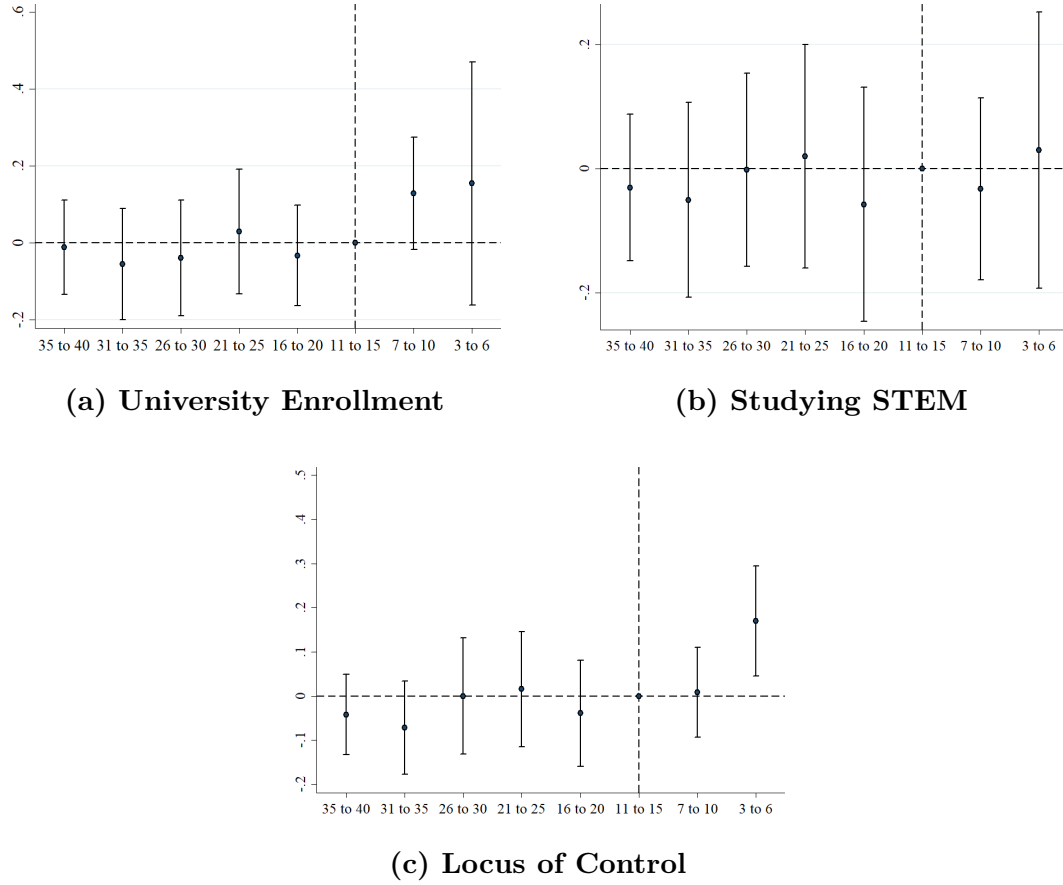
(a) University Enrollment

(b) Studying STEM

(c) Locus of Control

Notes: Based on the LUMS. The estimates are obtained with a two-way fixed effects OLS model. The dependent variables are university enrollment, studying STEM fields, and locus of control. The controls include parental educational attainment, parental occupation, presence of parents during childhood, economic situation at the age of 15, rural status of the place of birth, nationality, the number of younger and older brothers and sisters, and language spoken at daily life. The 95% confidence intervals are obtained with standard errors clustered at the county level.

Table 2. **Minutes of broadcast of female superhero cartoons and individual outcomes**

	(1)	(2)	(3)
	Females	Males	Triple Difference
Panel A: University enrolment			
Minutes of Broadcast (St.dev)	0.070**	-0.001	0.067*
	(0.027)	(0.028)	(0.039)
Mean of D.V.	0.284	0.243	0.265
Observations	3,205	2,550	5,755
Panel B: Studying STEM			
Minutes of Broadcast (St.dev)	0.002	0.004	-0.003
	(0.021)	(0.028)	(0.033)
Mean of D.V.	0.272	0.288	0.280
Observations Observations	2,499	2,150	4,649
Panel C: Locus of Control			
Minutes of Broadcast (St.dev)	0.021***	-0.003	0.025**
	(0.008)	(0.008)	(0.012)
Mean of D.V.	0.737	0.678	0.709
Observations	3,384	2,719	6,103

Notes: The data come from the LUMS. The estimates are obtained with a two-way fixed effects OLS model. The dependent variables are university enrollment, studying STEM fields, and perceptions of being able to affect others and the future. Z-Minutes of broadcast denotes the standardized minutes of the broadcast of female superhero cartoons. The controls include parental educational attainment, parental occupation, presence of parents during childhood, economic situation at the age of 15, rural status of the place of birth, nationality, and language spoken at daily life.
* statistically significant at the 10% level; ** at the 5% level, *** at the 1% level

Figure 4. Z-Mintues of Broadcast and Female Outcomes: Heterogeneity Analysis
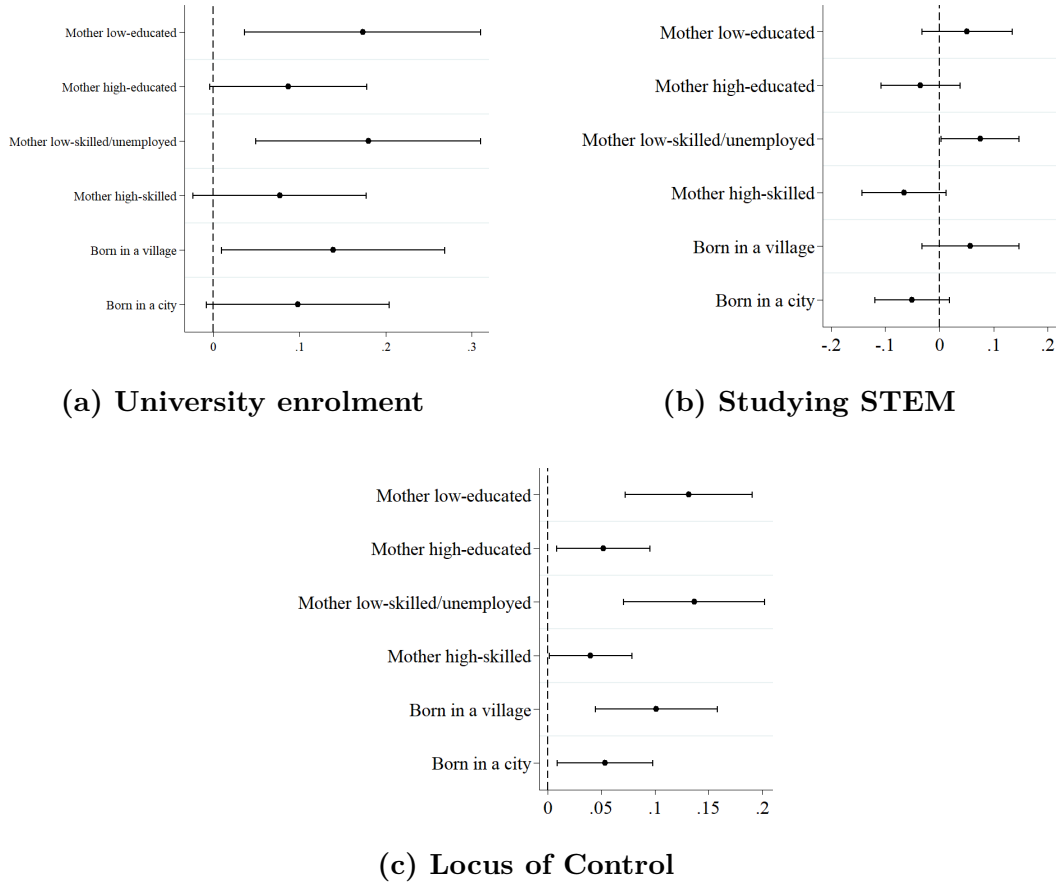
(a) University enrolment

(b) Studying STEM

(c) Locus of Control

Notes: Based on the LUMS. The estimates are obtained with a two-way fixed effects OLS model. The dependent variables are university enrollment, studying STEM fields, and locus of control. The variables of interest are the standardized minutes of the broadcast of female superhero cartoons. The controls include parental educational attainment, parental occupation, presence of parents during childhood, economic situation at the age of 15, rural status of the place of birth, nationality, the number of younger and older brothers and sisters, and language spoken at daily life. The 95% confidence intervals are obtained with standard errors clustered at the county level.

Table 3. **Minutes of broadcast of female superhero cartoons and occupation-related gender stereotypes**

	(1) Women	(2) Men	(3) Triple Difference
Panel A: Men make better political leaders			
Z-minutes	-0.117	-0.127	-0.051
	(0.071)	(0.077)	(0.103)
Mean of D.V.	0.363	0.527	0.434
Panel B: Men make better executives			
Z-minutes	-0.137***	-0.141	-0.051
	(0.049)	(0.090)	(0.106)
Mean of D.V.	0.288	0.420	0.346
Panel C: University is more important for a boy			
Z-minutes	-0.046	-0.144**	0.073
	(0.057)	(0.061)	(0.073)
Mean of D.V.	0.134	0.146	0.139
Observations	970	566	1,538

Notes: Based on EVS. The estimates are obtained with a two-way fixed effects OLS model. The dependent variables take values of one if respondents answered "agree strongly" or "agree" to the following gender stereotypes: "men make better political leaders", "men make better executives" and "university is more important for a boy". Z-Minutes of broadcast denotes the standardized minutes of the broadcast of female superhero cartoons. The controls include parental education, employment status of parents at age 14, the size of place of residence, and the variables that measure if parents liked to read books when a respondent was 14.
* statistically significant at the 10% level; ** at the 5% level, *** at the 1% level

Table 4. **Minutes of broadcast of female superhero cartoons and family-related gender stereotypes**

	(1) Women	(2) Men	(3) Triple Difference
Panel A: Man's job to earn money			
Z-minutes	-0.015	-0.158	0.126
	(0.039)	(0.106)	(0.127)
Mean of D.V.	0.525	0.540	0.532
Panel B: Child suffers with a working mother			
Z-minutes	-0.001	0.004	-0.031
	(0.067)	(0.084)	(0.123)
Mean of D.V.	0.235	0.304	0.265
Panel C: Family suffers with a working mother			
Z-minutes	0.011	0.128	-0.175
	(0.070)	(0.091)	(0.136)
Mean of D.V.	0.416	0.440	0.427
Observations	970	566	1,538

Notes: Based on EVS. The estimates are obtained with a two-way fixed effects OLS model. The dependent variables take values of one if respondents answered "agree strongly" or "agree" to the following gender stereotypes: "man's job to earn money", "child suffers with a working mother" and "family suffers with a working mother". Z-Minutes of broadcast denotes the standardized minutes of the broadcast of female superhero cartoons. The controls include parental education, employment status of parents at age 14, the size of place of residence, and the variables that measure if parents liked to read books when a respondent was 14.
* statistically significant at the 10% level; ** at the 5% level, *** at the 1% level

References

Adukia, A., Eble, A., Harrison, E., Runesha, H. B., and Szasz, T. (2023). What we teach about race and gender: Representation in images and text of children's books. *The Quarterly Journal of Economics*, 138(4):2225–2285.

Alesina, A., Giuliano, P., and Nunn, N. (2013). On the origins of gender roles: Women and the plough. *The quarterly journal of economics*, 128(2):469–530.

Ang, D. (2023). The birth of a nation: Media and racial hate. *American Economic Review*, 113(6):1424–1460.

Armand, A., Atwell, P., Gomes, J. F., Musillo, G., and Schenk, Y. (2024). Broadcasting equality: Media narratives and the rise of civil rights.". Technical report.

Bandura, A. et al. (1986). Social foundations of thought and action. *Englewood Cliffs, NJ*, 1986(23-28):2.

Banerjee, A., La Ferrara, E., and Orozco, V. (2019). Entertainment, education, and attitudes toward domestic violence. In *AEA Papers and Proceedings*, volume 109, pages 133–137. American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203.

Bazzi, S., Brodeur, A., Fiszbein, M., and Haddad, J. (2023). Frontier history and gender norms in the united states. Technical report, National Bureau of Economic Research.

Beaman, L., Duflo, E., Pande, R., and Topalova, P. (2012). Female leadership raises aspirations and educational attainment for girls: A policy experiment in india. *science*, 335(6068):582–586.

Bursztyn, L. and Cantoni, D. (2016). A tear in the iron curtain: The impact of western television on consumption behavior. *Review of Economics and Statistics*, 98(1):25–41.

DellaVigna, S. and Gentzkow, M. (2010). Persuasion: empirical evidence. *Annu. Rev. Econ.*, 2(1):643–669.

DellaVigna, S. and La Ferrara, E. (2015). Economic and social impacts of the media. In *Handbook of media economics*, volume 1, pages 723–768. Elsevier.

Duquennois, C. and Zeng, J. (2024). Casting roles, casting votes: Lessons from sesame street on media representation, racial biases, and voting. *Mimeo*.

England, D. E., Descartes, L., and Collier-Meek, M. A. (2011). Gender role portrayal and the disney princesses. *Sex roles*, 64:555–567.

Fernández, R., Fogli, A., and Olivetti, C. (2004). Mothers and sons: Preference formation and female labor force dynamics. *The Quarterly Journal of Economics*, 119(4):1249–1299.

Ferrara, E. L., Chong, A., and Duryea, S. (2012). Soap operas and fertility: Evidence from brazil. *American Economic Journal: Applied Economics*, 4(4):1–31.

Fogli, A. and Veldkamp, L. (2011). Nature or nurture? learning and the geography of female labor force participation. *Econometrica*, 79(4):1103–1138.

Gay, V. (2023). The intergenerational transmission of world war i on female labour. *The Economic Journal*, 133(654):2303–2333.

Gentzkow, M. and Shapiro, J. M. (2008). Preschool television viewing and adolescent test scores: Historical evidence from the coleman study. *The Quarterly Journal of Economics*, 123(1):279–323.

Goldin, C. (2014). A grand gender convergence: Its last chapter. *American economic review*, 104(4):1091–1119.

Goldin, C. and Olivetti, C. (2013). Shocking labor supply: A reassessment of the role of world war ii on women's labor supply. *American Economic Review*, 103(3):257–262.

Hennighausen, T. (2015). Exposure to television and individual beliefs: Evidence from a natural experiment. *Journal of Comparative Economics*, 43(4):956–980.

Jensen, R. and Oster, E. (2009). The power of tv: Cable television and women's status in india. *The Quarterly Journal of Economics*, 124(3):1057–1094.

Kearney, M. S. and Levine, P. B. (2015). Media influences on social outcomes: The impact of mtv's 16 and pregnant on teen childbearing. *American Economic Review*, 105(12):3597–3632.

Kearney, M. S. and Levine, P. B. (2019). Early childhood education by television: Lessons from sesame street. *American Economic Journal: Applied Economics*, 11(1):318–350.

Keefer, P. and Khemani, S. (2011). Mass media and public services: The effects of radio access on public education in benin. *World Bank policy research working paper*, (5559).

La Ferrara, E. (2016). Mass media and social change: Can we use television to fight poverty? *Journal of the European Economic Association*, 14(4):791–827.

Leaper, C. (2014). The social construction and socialization of gender during development. In *Toward a feminist developmental psychology*, pages 127–152. Routledge.

Lekfuangfu, W. N. and Lordan, G. (2023). Documenting occupational sorting by gender in the uk across three cohorts: does a grand convergence rely on societal movements? *Empirical Economics*, 64(5):2215–2256.

Miho, A., Jarotschkin, A., and Zhuravskaya, E. (2024). Diffusion of gender norms: Evidence from stalin's ethnic deportations. *Journal of the European Economic Association*, 22(2):475–527.

Okuyama, Y. (2021). Empowering women through radio: Evidence from occupied japan. *Unpublished, Uppsala University.*

Riley, E. (2024). Role models in movies: The impact of queen of katwe on students' educational attainment. *Review of Economics and Statistics*, 106(2):334–351.

Online Appendix

Figure A.1. **Share and Rating of the Most Popular Ukrainian TV Channels**

Panel A: Share   **Panel B: Rating**
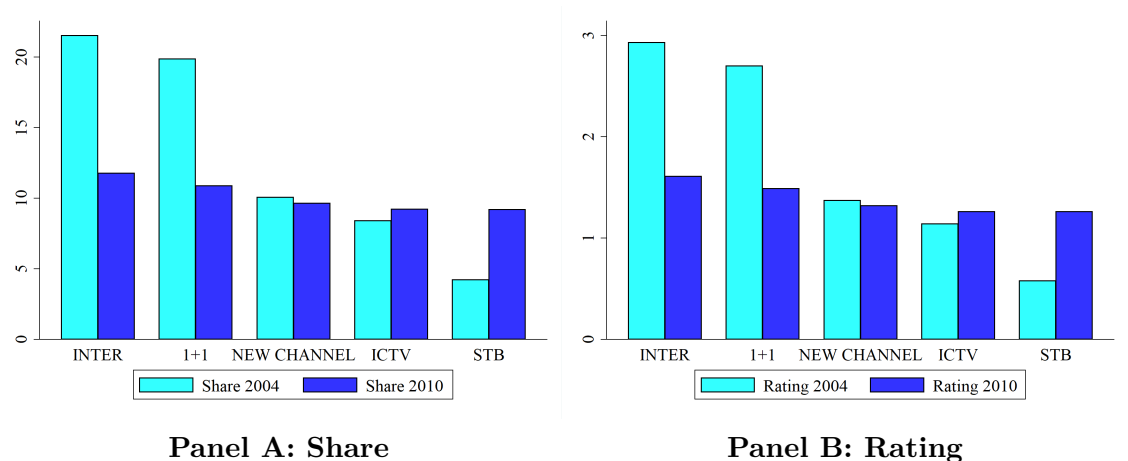
Notes: Based on the data from the Television Industry Committee. The graph bar shows the top five most popular channels in Ukraine based on share and rating in 2004 and 2010.

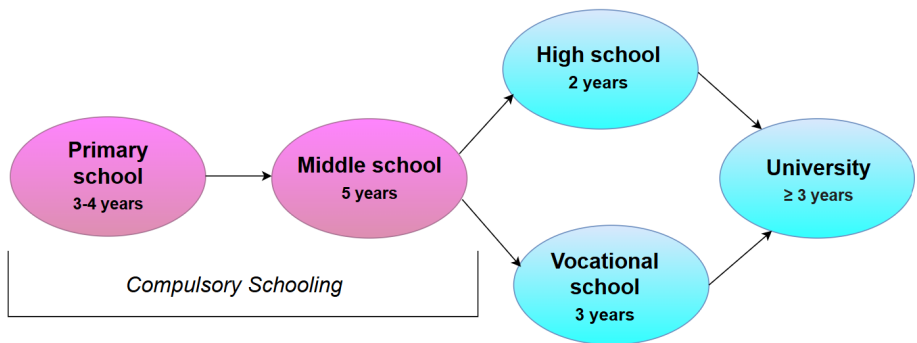**Figure A.2.** **Education System in Ukraine**

Figure A.3. Minutes of Animated Series with a Female Character, Alternative Definitions
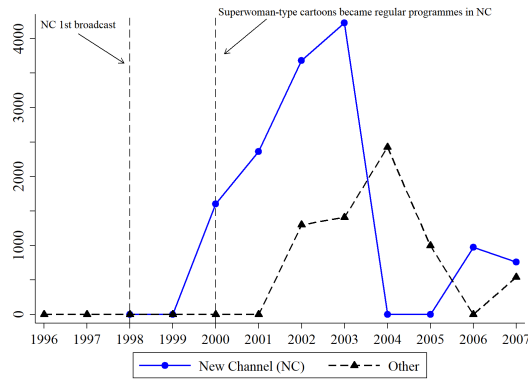
Panel A: Strong Definition
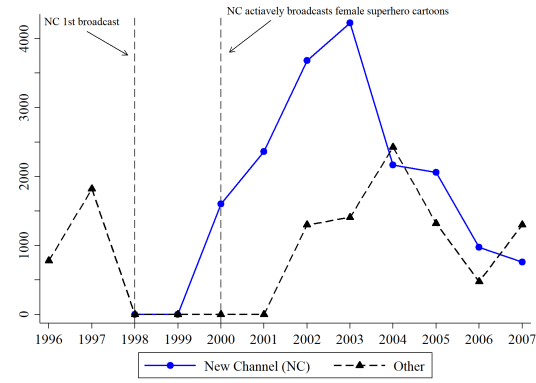
Panel B: Alternative Strong
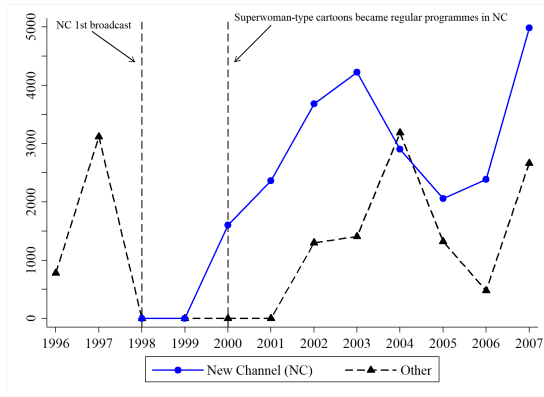
Panel C: Represent + Rescue
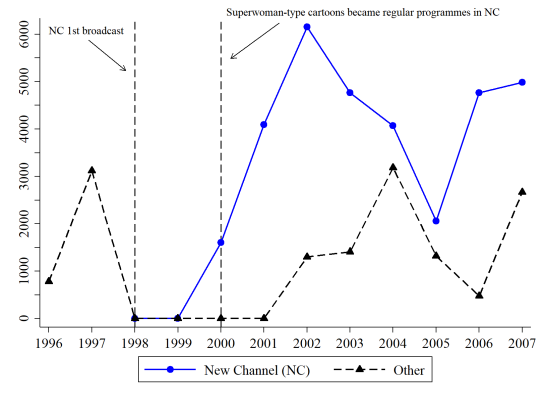
Panel D: Weak Definition

Notes: Based on data from Ukrainian TV guides from 1996 to 2007. The content is calculated based on the first week of every month in all years. The strong definition includes animated series with a female character who is a leader, performs rescues, and passes the Bechdel and Mako-Mori tests. The alternative strong definition adds series where the female character occasionally performs rescues. Represent + Rescue denotes animated series with a female character who performs rescues and passes the tests. The weak definition includes series where a female character passes the tests and is either a leader or performs rescues.

Table A.1. **Descriptive Statistics by Sex and Treatment Status (LUMS Data)**

	(1) Treated Male	(2) Treated Female	(3) Control Male	(4) Control Female
University enrolment	0.335	0.417	0.223	0.267
	(0.473)	(0.494)	(0.417)	(0.442)
STEM	0.290	0.241	0.199	0.183
	(0.455)	(0.429)	(0.399)	(0.386)
Impact on others	0.226	0.403	0.325	0.435
	(0.419)	(0.492)	(0.468)	(0.496)
Impact on future	0.191	0.312	0.274	0.352
	(0.394)	(0.464)	(0.446)	(0.478)
Urban	0.695	0.668	0.527	0.500
	(0.462)	(0.472)	(0.499)	(0.500)
Ukrainian	0.900	0.913	0.886	0.902
	(0.301)	(0.282)	(0.318)	(0.298)
No mother	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
No father	0.290	0.294	0.145	0.161
	(0.455)	(0.456)	(0.352)	(0.367)
Mother low-educated	0.350	0.316	0.624	0.656
	(0.478)	(0.466)	(0.484)	(0.475)
Father low-educated	0.350	0.352	0.587	0.606
	(0.478)	(0.478)	(0.492)	(0.489)
Mother low-skilled/unemployed	0.280	0.300	0.452	0.485
	(0.450)	(0.459)	(0.498)	(0.500)
Father low-skilled/unemployed	0.135	0.107	0.218	0.234
	(0.343)	(0.309)	(0.413)	(0.423)

Data source is the LUMS. The table reports summary statistics on selected characteristics (average value, and standard deviations in parentheses) between four sample groups. Column 1 is the male sample who had access to the superwoman-type animated series in their childhood; column 2 is the female sample with the access; columns 3 and 4 are the male and female sample who did not have access to the series during their childhood.

Table A.2. Descriptive Statistics by Sex and Treatment Status (EVS Data)

	(1) Male	(2) Female
Men make better leaders	0.562	0.378
	(0.497)	(0.485)
Men make better executives	0.479	0.270
	(0.500)	(0.444)
Education matters more for a boy	0.181	0.119
	(0.386)	(0.323)
Men's job to earn	0.595	0.509
	(0.491)	(0.500)
Child suffers with a working mother	0.301	0.239
	(0.459)	(0.427)
Family suffers with a working mother	0.481	0.452
	(0.500)	(0.498)
Mother low-educated	0.231	0.261
	(0.422)	(0.439)
Father low-educated	0.225	0.279
	(0.418)	(0.449)
Mother unemployed	0.085	0.086
	(0.279)	(0.280)
Father unemployed	0.028	0.044
	(0.166)	(0.206)
Small town	0.505	0.502
	(0.500)	(0.500)

Data source is the EVS. The table reports summary statistics on selected characteristics (average value, and standard deviations in parentheses) between the male sample (column 1) and the female sample (column 2).

Table A.3. Classification of the animated series with a female character

Series	Representation	Leads the show	Strong leader	Performs rescue	Channel
Omer et le Fils de l'Étoile	No	No	No (Omer is the leader)	Occasionally	NC
Dragon Flyz	No	No	No (Male-led team)	Yes	NC
Sky Dancers	Yes*	Yes	Yes	Yes	NC
Conan the Adventurer	No	No	No (Conan is the leader)	Yes	NC
Sailor Moon	Yes	Yes	Yes	Yes	NC
What About Mimi?	Yes	Yes	Yes	Yes	NC
Pippi Longstocking	Yes	No	No (Team effort)	No	NC
Scooby-Doo	No*	Yes	Yes	No (Adventurous but no rescue)	NC
Cardcaptor Sakura	Yes	Yes	Yes	Yes	NC
Jackie Chan Adventures	No*	No	No (Jackie is the leader)	Yes	NC
Sabrina	Yes	Yes	Yes	Occasionally	NC and ICTV
Gargoyles	Yes*	No	No (Primarily male-led)	Yes	NC
Guardians of the Galaxy	No	No	No (Star-Lord is the leader)	Yes	NC
Jason and the Heroes of Mount Olympus	No	No	No (Jason is the leader)	Yes	NC
Fairy Tale Police Department	No*	No	No (Team effort)	Occasionally	NC
X-Men	Yes	No	No (Xavier leads)	Yes	NC
Winx Club	Yes	Yes	Yes	Yes	NC
Teen Titans	Yes	No	No (Robin is the leader)	Yes	NC
The Life and Times of Juniper Lee	Yes	Yes	Yes	Yes	NC
The Little Mermaid	Yes*	Yes	Yes	Occasionally	ICTV
Little Lulu	Yes	Yes	Yes	No	ICTV
Ninja Robots (Tobikage)	No	No	No (Joe is the main protagonist)	Yes	UT-1
Exosquad	No*	No	No (J.T. Marsh leads)	Yes	ICTV
Monster Force	No	No	No (Team effort)	Yes	ICTV
Chip and Dale: Rescue Rangers	No	No	No (Chip and Dale lead)	Yes	1+1 and ICTV
Fantômette	Yes*	Yes	Yes	Yes	ICTV
Carmen Sandiego	Yes	Yes	Yes	Yes	ICTV
The New Adventures of Ocean Girl	Yes	Yes	Yes	Yes	INTER
Captain Planet and the Planeteers	Yes*	No	No (Team effort)	Yes	1+1
Buzz Lightyear of Star Command	No*	No	No (Buzz is the leader)	Yes	INTER
Totally Spies	Yes	Yes	Yes	Yes	UT-1
Loonatics Unleashed	No	No	No	Yes	NC
Princess Gwenevere and the Jewel Riders	Yes	Yes	Yes	Yes	ICTV
Kim possible	Yes	Yes	Yes	Yes	INTER

Notes: Based on archived weekly TV guides from 1996 to 2007. The first column denotes the name of the series; the second denotes whether the animated series passes the Bechdel and Mako-Mori Tests; the third denotes if the series is female-led; the fourth denotes if the series has a female character who acts as a strong leader; the fifth denotes portraying a female character who performs rescue. All animated series are characterized as having a female character who is brave and has agency to some extent.
*May vary depending on the threshold.

33

Table A.4. Content by Channel and Time Period

Name (est. year)	Period	Share of program contents				
		Adult programs		Animated series		
		Traditional	Western	Traditional	Western & No-Superwomen	Western & Superwomen
ICTV (1992)	pre-2000	66.70	27.30	1.30	4.70	0.00
	post-2000	52.69	39.32	0.00	7.94	0.05
NC (1998)	pre-2000	37.77	61.33	0.00	0.90	0.00
	post-2000	45.52	45.79	0.00	8.20	0.49

Notes: Authors' calculation, based on the Ukrainian television guide. Pre-2000 is referred to 1996-1999; post-2000 is referred to 2000-2007.

Table A.5. New Channel Arrival and Personality Traits (Factor Analysis, standardised unit)

	(1) Females	(2) Males	(3) Triple Difference
Panel A: openness			
NC	0.0134	0.0327	-0.0159
	(0.1120)	(0.0996)	(0.1089)
Observations	3185	2553	5738
Panel B: agreeableness			
NC	-0.0009	-0.0447	0.0124
	(0.1233)	(0.1210)	(0.1188)
Observations	3185	2553	5738
Panel C: conscientiousness			
NC	-0.0328	0.3716***	0.0043
	(0.1326)	(0.1225)	(0.1305)
Observations	3185	2553	5738
Panel D: extrovert			
NC	0.0448	0.0188	0.0821
	(0.1356)	(0.1392)	(0.1332)
Observations	3185	2553	5738
Panel E: anxiety			
NC	0.1408	0.1333	0.1544
	(0.0998)	(0.1223)	(0.0966)
Observations	3185	2553	5738

Notes: The data is from the LUMS. The estimates are obtained with a two-way fixed effects OLS model. The controls include parental educational attainment, parental occupation, presence of parents during childhood, economic situation at the age of 15, rural status of the place of birth, nationality, and language spoken at daily life. * statistically significant at the 10% level; ** at the 5% level, *** at the 1% level.

Table A.6. **New Channel Arrival and Personality Traits (normalised unit)**

	(1) Females	(2) Males	(3) Triple Difference
Panel A: openness			
NC	0.0064	0.0185	0.0022
	(0.0174)	(0.0166)	(0.0176)
Observations	3344	2684	6028
Panel B: agreeableness			
NC	-0.0067	0.0237	-0.0018
	(0.0240)	(0.0181)	(0.0228)
Observations	3337	2682	6019
Panel C: conscientiousness			
NC	0.0067	0.0524***	0.0097
	(0.0213)	(0.0189)	(0.0210)
Observations	3332	2674	6006
Panel D: extrovert			
NC	0.0163	0.0042	0.0200
	(0.0276)	(0.0278)	(0.0277)
Observations	3366	2689	6055
Panel E: anxiety			
NC	0.0230	0.0205	0.0236
	(0.0208)	(0.0227)	(0.0208)
Observations	3355	2680	6035

Notes: The data is from the LUMS. The estimates are obtained with a two-way fixed effects OLS model. The controls include parental educational attainment, parental occupation, presence of parents during childhood, economic situation at the age of 15, rural status of the place of birth, nationality, and language spoken at daily life. * statistically significant at the 10% level; ** at the 5% level, *** at the 1% level.

Table A.7. **New Channel Arrival and Locus of Control (normalised unit)**

	(1)	(2)	(3)
	Females	Males	Triple Difference
Panel A: Affect Others (binary)			
NC	0.0979**	-0.0257	0.0952**
	(0.0492)	(0.0533)	(0.0478)
Observations	3386	2713	6099
Panel B: Affect Others (normalised)			
NC	0.0186	0.0124	0.0235
	(0.0297)	(0.0276)	(0.0292)
Observations	3381	2715	6096
Panel C: Affect Future (binary)			
NC	0.0930**	0.0277	0.0965**
	(0.0459)	(0.0456)	(0.0456)
Observations	3381	2715	6096
Panel D: Affect Future (normalised)			
NC	0.0484	-0.0585*	0.0478
	(0.0301)	(0.0321)	(0.0292)
Observations	3386	2713	6099

Notes: The data come from the LUMS. The estimates are obtained with a two-way fixed effects OLS model. The controls include parental educational attainment, parental occupation, presence of parents during childhood, economic situation at the age of 15, rural status of the place of birth, nationality, and language spoken at daily life. * statistically significant at the 10% level; ** at the 5% level, *** at the 1% level.