Knocking on Hell's door. Dismantling hate with cultural consumption

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Papers in Evolutionary Economic Geography

21.31

Utrecht University

Human Geography and Planning

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Abstract. How local cultural activities influence development and human behaviour is gaining growing attention in economic geography. Small scale experimental evidence shows that cultural consumption is effective in countering hate. This is crucial, as hate, in turn, has a negative influence on the socioeconomic performance of places. Still, little is known on this, outside few more qualitative case studies. This paper provides a quantitative measure of the impact of cultural consumption on hate events in the Italian NUTS3 regions. IV estimation using a unique longitudinal database, with georeferenced hate manifestations and a population-based measure for cultural consumption, shows that cultural consumption determines a reduction in hate events. Our findings support the idea that cultural change acts a key enabling factor for people open-mindedness and inclusiveness of places. Moreover, our results hold even after various robustness checks, suggesting the need for policy interventions promoting cultural consumption.

Keywords: hate, discontent, cultural economics, spillovers, social capital

JEL codes: D31, H0, I 31, J15, Z1

1. Introduction

Hate has non-negligible economic costs. It undermines social cohesion, dampens collaboration, solidarity and trust (Glaeser, 2005; Hall, 2013), which are all vital for economic performance (Guiso, Sapienza and Zingales, 2006). Hate victims experience vulnerability, anxiety and shame (Paterson *et al.*, 2018). These feelings compromise their social and working life. Hate also harms people belonging to the same group of the victims, since the sense of fear often "spills-over" to the whole group (Iganski, 2008).

Institutions are increasingly preoccupied with countering hate, acknowledging that people do not restrain from hating just because it is forbidden by law *(i.a.* OSCE-ODHIR, 2019; Siragusa, Vizcaino, Proietti, & Lavalle, 2020; von der Leyen, 2020). Indeed, evidence shows that hate is often culture-related (*i.a.* Gerstenfeld, 2017; Hall, 2013) and with a strong local dimension (Anderson, Crost and Rees, 2020; Denti and Faggian, 2021). Recent work calls for the exploration of interventions capable of changing stereotypes and prejudices to decrease hate (Nollenberger, Rodríguez-Planas and Sevilla, 2016), and evidence shows that values and beliefs evolves through the effect of external factors (Andersen *et al.*, 2017; Giavazzi, Petkov and Schiantarelli, 2019), including exposure to new cultural stimuli.

Thus, understanding the influence of cultural activities on hate has both an economic and policy dimension.

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Despite the growing interest on hate and the existing rather limited evidence showing that cultural consumption can counter hate, a larger scale quantitative study on the relationship between cultural consumption and hate is still missing. We aim at filling this gap.

Our work relates to the increasing interest in economic geography on the role of culture - defined in terms of local beliefs, value and expectations - in shaping the socio-economic development of places (Huggins and Thompson, 2019; Huggins *et al.*, 2021). We provide evidence on the role of culture in offsetting hate, adding to the existing contributions investigating the influence of local culture on socioeconomic outcomes, such as innovation (Farole, Rodríguez-Pose and Storper, 2011), entrepreneurship (Audretsch *et al.*, 2017; Capelleras *et al.*, 2019), local taxation (Eugster and Parchet, 2019), migration flows (Kemeny and Cooke, 2018), redistribution (Guiso, Sapienza and Zingales, 2006; Bazzi, Fiszbein and Gebresilasse, 2020), trade and FDI (Guiso, Sapienza and Zingales, 2009), civic capital and institutional quality (Becker *et al.*, 2016; Guiso, Sapienza and Zingales, 2016; Pitlik and Rode, 2017), human capital development (Carlana, 2019; Figlio *et al.*, 2019), job-search (Eugster *et al.*, 2017), GDP (Tabellini, 2010) and financial markets (Guiso, Sapienza and Zingales, 2008).

Showing that cultural consumption influences hate, we argue that culture promotes local inclusiveness and well-being, improving the local socioeconomic performance. In this sense, this work relates to the growing interest in policy fostering the well-being of places and sustainable growth (OECD, 2014; Veneri and Edzes, 2017; Nozal, Martin and Murtin, 2019; Veneri and Murtin, 2019).

The paper also contributes to the evidence-base on the socioeconomic geography of hate (Anderson, Crost and Rees, 2020; Denti and Faggian, 2021) by investigating the role of culture as a "protective factor" against hate.

We focus on Italy, as it represents an interesting case for different reasons. First, Italy is facing a growing trend in the number of hate events, with a 31% average annual growth rate between 2009 and 2018 (Lunaria, 2019; OSCE-ODIHR, 2019). Second, figures show that Italian hate events are spatially heterogeneous (Denti and Faggian, 2020) and strongly influenced by the local environment (Denti and Faggian, 2021). Third, descriptive evidence in Italy shows that the share of people not taking part to any cultural activity is growing (ISTAT, 2020). Forth, we exploit a unique longitudinal database for Italian NUTS3 regions constructed by merging information on georeferenced hate events with cultural consumption patterns between 2009 and 2018.

Our strongest and most significant finding is that an increase cultural consumption is associated with a strong and significant decrease of hate events. Our results are robust to instrumenting cultural consumption with shift-share instrumental variables (IV) based on the historical (1955) cultural consumption across Italian NUTS3. Including a rich set of controls at the local level (NUTS3) to address lingering concerns about omitted variables, including persistent cultural norms and spatial spillovers, does not change the estimates. Moreover, we follow Mayda, Peri and Steingress (2021) in checking for reverse

causation by testing whether past hate events affected the cultural consumption. And we find no evidence of such reverse causation.

The paper is organized as follows. The next section reviews the relevant literature. Sections 3 and 4 describe the data and the empirical strategy. Sections 5 presents our findings and robustness checks. Finally, section 6 discusses the results and offers some conclusions and policy implications.

2. Background literature

Following two different strands of literature, we argue that cultural consumption may generate a cultural change capable of countering hate.

The first strand of literature shows that hate narratives are built on stereotypes and prejudices (Glaeser, 2005; Voigtlander and Voth, 2012; Brown, 2014). These stereotypes and prejudices are part of the local culture, which is defined as the set of beliefs, values and expectation shared by members of a social groups (Perry, 2001; Whitley and Kite, 2010). Recently scholars, following a more "evolutionary" perspective on culture (Andersen *et al.*, 2017; Giavazzi, Petkov and Schiantarelli, 2019), have found that some components of local culture, including stereotypes and prejudices, evolve quickly after people experience new stimuli (Andersen *et al.*, 2017; Giavazzi, Petkov and Schiantarelli, 2019; Giuliano and Nunn, 2021). This evidence disputes the idea that culture is a slowly moving feature, hence opening up to the opportunity that cultural consumption may influence people's beliefs also with regard to hatred. Stereotypes and prejudices also have a strong local dimension as they contribute to the "community culture", which defines the broader societal traits and relations shaping places in terms of prevailing mindsets, the overall 'way of life' and relevant socioeconomic features such as trust and cooperation (Huggins and Thompson, 2015). "Community culture" can change when new stimuli are introduced (Huggins and Thompson, 2016; Huggins *et al.*, 2021).

These works can be related to the evolutionary perspective on culture, which considers cultural norms as transmitted through different channels, as in models of evolutionary biology (Giavazzi, Petkov and Schiantarelli, 2019; Desmet and Wacziarg, 2021). According to this perspective, there are two different channels of cultural transmission. There is a vertical channel, mainly happening through the family, that tends to be conservative and transmits persistent values such as religious attitudes. Then, there is also an horizontal channel, mainly happening through interactions with the local context (Andersen *et al.*, 2017; Desmet and Wacziarg, 2021), which can generate rapid cultural innovation on flexible cultural norms such as fairness and solidarity (Giavazzi, Petkov and Schiantarelli, 2019). Cultural consumption is part of the interactions happening in the social context, hence it is potentially capable of evolving hate beliefs.

The second strand of literature includes a series of studies in social psychology, showing that cultural consumption is an effective way to change the cultural *status quo* by changing stereotypes and prejudices (Inglehart, 2004; Appel and Richter, 2007; Vezzali *et al.*, 2014; Crociata, Agovino and Sacco, 2015; Murrar

and Brauer, 2018). Cultural consumption includes museum exhibitions, concerts, theatres, media, books etc. (Rössel, Schenk and Weingartner, 2017). In fact, the "*indirect contact theory*" (Vezzali *et al.*, 2014), argues that cultural consumption helps in overcoming existing prejudices by allowing the audience to identify with media characters. Through this alignment, people experience the new perspectives embodied by the media characters in a way that is similar to those produced by direct contact (Ben, Kelly and Paradies, 2020; Paluck *et al.*, 2021). This vicarious indirect contact - with the diverse cultural values embodied by the media character they identify with - enables a cognitive improvement (Murrar and Brauer, 2019; Paluck *et al.*, 2021), reinforces empathy (Lemmer and Wagner, 2015; Van de Vyver and Abrams, 2018) and reduces stress (Brown and Paterson, 2016). For example, data show that exposure to fiction reduces implicit and explicit prejudices against Arab-Muslim (Johnson *et al.*, 2013; Johnson, Huffman and Jasper, 2014), and other stigmatized groups (Vezzali *et al.*, 2015; Visintin *et al.*, 2017).

This process is particularly effective to address negative prejudices against "out-groups" in contexts where direct contact is particularly difficult due to hostility and segregation or in socially/ethnically homogeneous communities (Vezzali *et al.*, 2014; Brown and Paterson, 2016; Murrar and Brauer, 2018).

Randomized Controlled Trials in the US show that going to the theatre - also controlling for individual characteristics such as gender, ethnicity, human capital and income - has positive effects on tolerance (Greene *et al.*, 2018). Similar results are found considering attendance to art exhibitions and concerts (Murrar and Brauer, 2018; Waston *et al.*, 2019). Other evidence, again in the US context, shows that art exhibitions also increase tolerance by about 7% (Greene, Kisida and Bowen, 2014). Exposure to fiction reduces implicit and explicit prejudices against immigrants and homosexuals both in Italy (Vezzali *et al.*, 2015) and in the US (Kaufman and Libby, 2012; Walter, Murphy and Gillig, 2018; Bond, 2021).

This issue is strictly related to work in economic geography investigating the influence of local culture on behaviours, which is still empirically under investigated (Huggins and Thompson, 2019). Further, it also contributes to the evidence-base on the sources of regional variation in culture (Huggins *et al.*, 2021) and on the understanding of cultural change at local level (Huggins and Thompson, 2015).

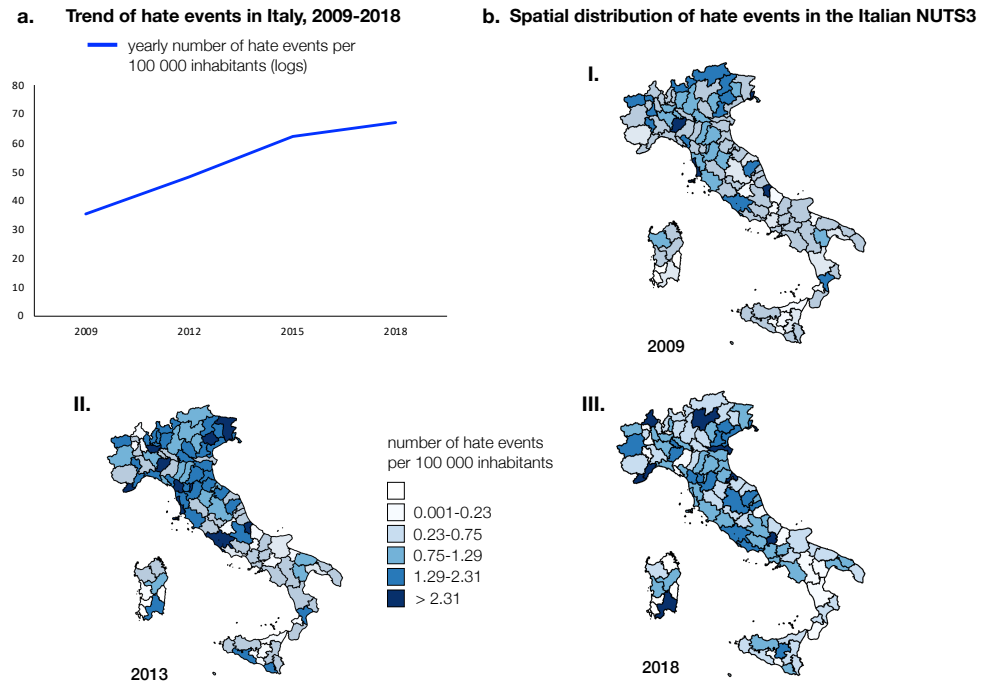
In our analysis, we also account for the evidence supporting the role persistent cultural norms on socioeconomic behaviours (*i.a.* Guiso, Sapienza and Zingales, 2016; Dustmann *et al.*, 2017; Inglehart and Norris, 2017). Notably, these works do not account for the recent evidence showing that cultural values change, and they consider culture mainly through an historical legacy perspective. Our approach is different, but we account for this established evidence among our robustness checks, by including a measure for the persistency of local cultural outlooks among confounders.

3. Data

We use geotagged data on hate events to measure the local intensity of hate and data on local consumption of cultural products to measure the intensity of new cultural stimuli occurring at the local level.

The source of data on hate events is the Lunaria database. Lunaria is an Italian non-profit organization, which has been collecting reports on hate events since 2007. The reliability of the database has been vetted by international institutions, such as the OECD, the OSCE and the European Commission (Siragusa *et al.*, 2020), which often refer to it in the monitoring of hate events in Italy[1]. The Lunaria database contains hate events reported by Italian newspapers and NGOs, which are verified through multiple sources such as cross-checking with other media and administrative records. The inclusion of NGOs reports alleviates the problem of underreporting hate events to the police. Each observation contains the place and the date of the event, allowing to map them across the Italian NUTS3 areas for each year starting from 2007. We consider events between 2009 and 2018, which are summarized in Figure 1. In the considered time period, hate events have been steadily growing at the national level (Figure 1.a.), with persistent spatial dispersion (Figure 1.b I-III). Their coefficient of spatial variation across Italian NUTS3 is steadily above 80%, suggesting that local features play a role in shaping hate.

Figure 1: The national trend and the spatial outlook of hate events in Italy between 2009 and 2018

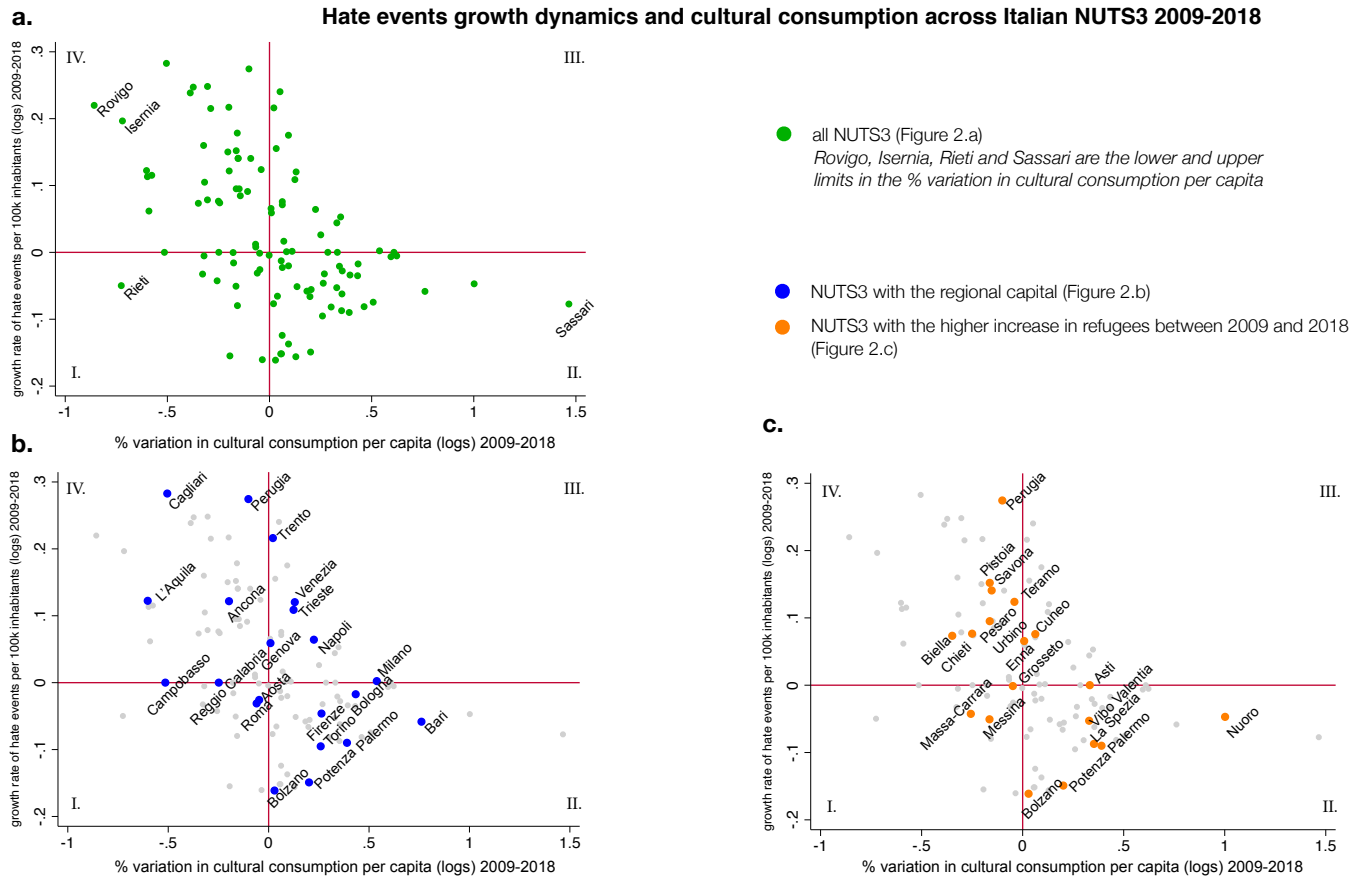


[1] Lunaria is also a relevant partner for Italian institutions on hate monitoring. In 2020 Lunaria launched the Italian *Observatory on Discrimination in Sport* in partnership with the Italian Government Anti-Discrimination Office (UNAR, 2020). Lunaria was also partner of the Italian National Statistical Office (ISTAT) and OECD for the development of well-being statistics merging administrative and non-administrative data, including Internet data (ISTAT, OECD and Lunaria, 2016).

To measure cultural consumption, we use the SIAE data on the total audience to cultural events (both free and paid admissions) for the Italian NUTS3 areas. To the best of our knowledge, this unique database provides the most-comprehensive yearly information on cultural consumption at spatial fine-granularity for Italy. SIAE is the Italian Society of Authors and Publishers, a public body controlled by the Presidency of the Italian Government, the Ministry of Cultural Heritage and Tourism and the Ministry of Economy and Finance. The SIAE Observatory -"*Osservatorio dello Spettacolo*"- collects yearly data on the cultural activity in public and private venues involving concerts, cinema, theater, opera, musical comedies, dance, exhibitions, traveling show attractions. Although it is a good proxy for cultural consumption (and the best available to our knowledge), it has some limitations that we acknowledge. First, it does not measure book readings, which undoubtedly constitute a relevant component of cultural consumption. Second, it conveys information on the "quantity" of events, the size of the audience and the money spent on attendance, with no measure of the "quality" of the events. Despite these limitations, it represents a thorough population-based measure for cultural consumption at NUTS3 level and it has the advantage to include data as far back as the 1930s. Alongside normalizing cultural consumption by the resident population, we weight the cultural consumption of each NUTS3 area by the touristic attractiveness of the area, measured through a yearly index from the National Office of Statistics (ISTAT). The weighting strategy corrects for the fact that certain areas may be characterized by patterns of cultural consumption highly determined by tourists rather than locals (Espon, 2020) by assigning higher weights to the cultural consumption in NUTS3 areas less attractive to tourists. Our timespan is 2009-2018.

Cultural consumption has marked spatial differences across provinces, as summarized by Figure 2.a, which displays the growth of hate events and cultural consumption across Italian NUTS3 regions between 2009 and 2018. Nearly half of NUTS3 regions (46%) lie in quadrants I and IV, where cultural consumption has a negative trend, while the remaining NUTS3 (54%) lie in quadrants II and III, with a positive trend of cultural consumption. From figure 2.a we also see that the majority of NUTS3 are clustered in quadrants II and IV. The bulk of NUTS3 regions with a negative variation in cultural consumption lies in quadrant IV, where hate events have a positive growth rate. The majority of NUTS3 with a positive variation in cultural consumption lies in quadrant II, where hate events have a negative growth rate. The observed distribution does not appear to be influenced either from the NUTS3 containing the regional capital (Figure 2.b) or by the NUTS3 with the higher increase in hosted refugees between 2009-2018 (Figure 2.c). This descriptive evidence seems to support a negative effect of an increase in cultural consumption on the growth rate of hate events (see Figure A1 in the Appendix for additional descriptive evidence). The range of potential outcomes supports a thorough analysis of the local factors that can influence the relationship between cultural consumption and hate events acting as confounders.

Figure 2: Cultural consumption and the growth of hate events 2009-2018



Alongside cultural consumption, we consider several potential confounding factors that have been identified in the literature. We consider foreign population and refugees (*i.a.* Barone, D'Ignazio, de Blasio, & Naticchioni, 2016; Halla, Wagner, & Zweimüller, 2017), educated people (Lancee and Sarrasin, 2015; Piff and Robinson, 2017; Denti and Faggian, 2021), crime rate (*i.a.* Dustmann & Fasani, 2016), unemployment (*i.a.* Anderson, Crost, & Rees, 2020; Falk, Kuhn, & Zweimüller, 2011) and social capital (Satyanath, Voigtländer and Voth, 2017; Fratesi, Percoco and Proietti, 2019) (See Table A1-A2 in the Appendix for variables' summary and descriptive statistics). Social capital is measured through a synthetic indicator designed through Principal Component Analysis (PCA) to cover different aspects of social capital according to established literature (Fini *et al.*, 2011; Micucci and Nuzzo, 2012; Ferrara and Nisticò, 2015; Calcagnini, Giombini and Perugini, 2019), and exploiting available data with yearly observations for the Italian NUTS3 areas (more details are provided in the Appendix, Tables A3-A4 and Figure A2). Given that there are many missing observations for the share of refugees, we do not use this variable in the baseline model specifications, and we include it in the estimations performed in the robustness checks.

4. Empirical strategy

Our aim is to measure the effect of local cultural consumption on the proliferation of hate events at provincial level (NUTS3). Exploiting the strongly balanced longitudinal nature of our data, we estimate a Two-Way Fixed Effect model as baseline. We also include potential spillover effects of cultural consumption in neighboring provinces, specifying a spatial-lag that accounts for the possibility that hate events in area i depends systematically on the cultural consumption in neighboring areas $k \in J$, where J is the set of all areas (Anselin, 1988) and $k = 4$. Formally, the model is as following:

$$lnhate_{it} = \alpha + \delta_1 lnculture_{it} + \gamma_1 lnSpillcult_{it} + \nu_{it}\Omega_{it} + \mu_i + \tau_t + \vartheta_{it} \quad (1)$$

where $lnhate_{it}$ is the number of hate events per 100 000 inhabitants in NUTS3 i at time t. $lnculture_{it}$ is the size of the audience of cultural events (both paid and free admissions) adjusted to deflate attendance from tourists and weighted by the total population in NUTS3 i at time t. $lnSpillcult_{it}$ is the size of the audience of cultural events (both paid and free admissions) adjusted to deflate attendance from tourists weighted by the total population in the neighboring NUTS3s. Ω_{it} contains the control variables capturing observable economic and social differences across provinces, all weighted by population, μ_i and τ_t are space and time fixed effects respectively. All explanatory variables are in logs as specified in eq. (1). The two parameters we are most interested in are δ_1, which measures how hate events at provincial level are directly influenced by cultural consumption in the same province; and γ_1, which measures whether hate events at provincial level indirectly are influenced by cultural consumption in neighboring provinces.

4.1 Identification

Potential endogeneity of cultural consumption could produce bias estimates. A possible source of bias is sorting of people across provinces. An increase in hate events may push people interested in the consumption of cultural amenities, to move in areas where the payoffs from amenity consumption are not countered by the hate disamenity. To mitigate this concern, we construct a Bartik-type instrumental variable (Baum-Snow and Ferreira, 2015). In particular, we predict the cultural consumption in $NUTS3_i$ using historical information on the local cultural consumption in 1955. In practical terms, we start with the initial (1955) geography of cultural consumption across Italian NUTS3 regions, and we allow cultural consumption in this initial distribution to grow over time according to the national patterns. Hence, the initial cultural consumption at the NUTS3 level serves as a set of weights indicating how national cultural consumption growth likely affects each NUTS3. Formally, the Bartik-type instrument (Goldsmith-Pinkham, Sorkin and Swift, 2020) z_{it} is given by

$$z_{it} = q_i g_t^{IT} \quad (2)$$

where q_i is the share of annual audience expenditure in cultural events per capita in NUTS3 i in 1955 and g_t^{IT} is a measure of growth in annual audience expenditure in Italy at time t, with $t \in [2009,2018]$ and normalized using the 2019 Consumption Price Index (CPI).

We choose 1955 as the initial geography of cultural consumption for several reasons. First, data on historical cultural consumption for Italian NUTS3 are available starting from 1931, so we cannot go backward. Second, the years between 1924 and 1955 had a particularly restricted cultural production and consumption in Italy, due to the strong control and censorship imposed by Fascist regime, the World War 2, the Nazi occupation and the after-war reconstruction (Gordon, 2000; Rundle, 2000; Bonsaver, 2003; Barbero, 2017). Further, cultural products were available for a very restricted audience (Bonsaver and Gordon, 2005). In the 50s, the new geopolitical landscape and the economic boom provided for sizeable cultural stimuli and mass production and consumption of cultural products throughout the whole Italian territory (Gundle, 2000; Cosulich, 2003). Third, it seems reasonable to focus on a year which is sufficiently detached from the years spanning between the end of 1960s till late 1980s, since in those years Italy was shaken by social and political turmoil with various incidents of far-left and far-right political terrorism ("*anni di piombo*").

By freezing the geography of cultural consumption in 1955, we alleviate sorting concerns, namely that households move in search of a places with a given level of tolerance (Boustan *et al.*, 2013). At the same time, some threats to identification remain and we discuss some of them here. First, there could be reverse causation combined with persistence and correlation over time. If places that are more likely to experience hate also reduce cultural consumption and correlation over time is strong, this channel might bias estimates. We address this issue performing a falsification test following Mayda, Peri and Steingress (2021), practically regressing the cultural consumption on a measure of past hate, to show that there is no significant correlation. Another threat is that places may have persistent features influencing cultural consumption and hate. Again, following Mayda, Peri and Steingress (2021), we reduce this concern using place and historical outlook fixed effect and socioeconomic controls.

Having identified our instrumental variable, we use eq. (1)-(2) to estimate whether there is a causal relationship between cultural consumption and hate events by means of a Two-Stage Least Square with Instrumental Variable (2SLS-IV) model for panel data with time and space fixed effects. For robustness check we also change the baseline year for the instrumental variable considering both 1958 and 1961. The strength of the IV estimates is also assessed with regard to some caveats about the use of Bartik-type instruments (Jaeger, Ruist and Stuhler, 2018; Goldsmith-Pinkham, Sorkin and Swift, 2020), the main critique being that the shift-share instrument does not account for local adjustment dynamics that can affect the investigated outcome. More into details, the standard Bartik instrument fails to account for contemporaneous factors (e.g. local shocks) that affect both local hate events and cultural consumption (McKenzie, 2018). If the adjustment to these shocks takes time, estimates might suffer from serial

correlation due to the ongoing general equilibrium adjustment effects (Jaeger, Ruist and Stuhler, 2018). To account for this, among robustness checks the results from the IV panel with fixed effects are assessed following the "*multiple instruments*" approach by Jaeger et al. (2018) to account for potential adjustment dynamics. Formally, eq (1) is estimated through IV panel estimation with fixed effect adding a lagged cultural consumption among regressors and instrumenting for this with the analogous Bartik instrument.

Among robustness checks, we also assess our findings accounting for the potential effect of persistent cultural features, acknowledging extant research showing that while some cultural features are changing, others display persistency (Becker *et al.*, 2016; Guiso, Sapienza and Zingales, 2016; Giavazzi, Petkov and Schiantarelli, 2019; Giuliano and Nunn, 2021; Huggins *et al.*, 2021). We do so following established literature on the effect of persistent culture in Italy, designing our proxy for the influence of historical culture exploiting the geography of Italy prior to the 1861 unification process (Di Liberto and Sideri, 2015; Guiso, Sapienza and Zingales, 2016).

Finally, among robustness checks, we also account for the possibility that hate events at time t are a function of that same attitude at time $t\text{-}1$ as modified by new information. This idea is based on established literature on public opinion and attitudes (Wilkins, 2018) showing that behaviors, such as hate, may display some degree of time persistency. To account for this, we specify a dynamic panel model where past levels of hate are introduced as predictors of current hate. Formally, we estimate the Arellano-Bond dynamic model using the Generalized Method of Moment (GMM)-difference panel data regression estimation methods, that also allows to account for the potential endogeneity of the relationship between cultural consumption and hate (Cameron and Trivedi, 2010). We also allow for cultural consumption not being strictly exogenous, by assuming that it depends on its past realizations (Crociata, Agovino and Sacco, 2014), since the GMM methods allows for the inclusion of lags of the treatment (Wilkins, 2018), and on past and possibly current realizations of the errors. The model specification is given by the following dynamic model in levels with a time-lagged dependent variable, a time-lagged independent treatment, a time-lagged external spillover factor for the treatment and the set of control variables

$$lnHate_{it} = a_0 + blnHate_{it-1} + d_1 lnculture_{it} + d_2 lnculture_{it-1} + c_1 lnSpillcult_{it} + \\ + c_2 lnSpillcult_{it-1} + f_{it}\Omega_{it} + \mu_i + \tau_t + \varepsilon_{it} \quad (3)$$

By estimating the GMM model, we also relate to the existing debate on the pros and cons of including a lagged dependent variable among regressors[2] (Wilkins, 2018), to check whether our results may be driven by the inclusion/exclusion of this regressor.

[2] Lagged Dependent Variables (LDV) critics argue that LDVs suppress the explanatory power of other variables so that regressions that exclude the LDVs often obtain larger coefficient estimates for independent variables, compared with regressions that include the LDVs. LDVs supporters show that when the LDV is part of the data-generating process, excluding it creates omitted variable bias (Keele and Kelly, 2006).

5. Results

5.1 Baseline results

In eq. (1) we estimate a Two-Way Fixed Effect model on a longitudinal database with observations covering 106 NUTS3 for the period 2009-2018[3]. Table 1 reports the results[4]. They show that an increase in cultural consumption leads to a reduction in hate events in all model specifications (for detailed results on estimates of the control variables, see Table A5 in the Appendix). The size of the estimated effect is non negligible. Starting from the baseline specification summarized by column 1, if local cultural consumption increases by 1 p.p., hate events decrease by nearly the 15%, as outlined by the coefficient for cultural consumption. Moreover, we also find that an increase in cultural consumption in the neighboring areas has a mild countering effect on hate events. In this case, an increase by 1 p.p. is related to a decrease of nearly the 13% of hate events.

Table 1: Two-way fixed effect panel model estimates and sensitivity tests for the effect of cultural consumption on hate events in the Italian NUTS3 areas between 2009 and 2018

	No interaction	Interaction term		
	(1)	(2)	(3) No spatial spillovers	(4) Refugees
Cultural consumption	**-0.147****	**-0.165****	**-0.175*****	**-0.172****
	(0.073)	**(0.074)**	**(0.064)**	**(0.08)**
Cultural consumption spillovers	-0.133*	-0.130*		-0.185**
	(0.073)	(0.073)		(0.076)
Social capital	-0.031	0.077	0.081	0.116
	(0.053)	(0.093)	(0.094)	(0.105)
Social capital*cultural consumption		-0.042*	-0.04	-0.043
		(0.024)	(0.024)	(0.028)
Controls	YES	YES	YES	YES
Refugees among controls	NO	NO	NO	YES
TIME FE	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES
R-squared	0.207	0.210	0.204	0.202
Obs	1050	1050	1060	810
Cluster	106	106	106	106
LM test autocorrelation	0.1978	0.1952	0.1366	0.4329

Robust standard errors; Coefficients statistically significant at ***1%, **5%, and *10%
Controls are: (i) human capital, foreign population, unemployment, crime rate in columns 1-3; (ii) human capital, foreign population, unemployment, crime rate, refugees in column 4

These findings hold to the inclusion of potential confounders, which behave according to the established literature. Looking for possible interactions between cultural consumption and other socio-economic variables, we find evidence of a mild effect exerted by the interaction with social capital

[3] We have excluded the NUTS3 Sud Sardegna since data on its cultural consumption were fragmented.
[4] Estimation has been performed using the command `xtreg` in STATA.

(column 2)[5]. Although social capital does not exert any significant direct effect, its interaction with cultural consumption creates a further decrease in hate events by about 4%. The diminishing effect on hate of the interaction between social capital and cultural consumption can be interpreted referring to the dual valence of social capital acknowledged by the literature, depending on its being either mainly bonding or bridging. Bonding social capital favors cooperation and collaboration among people with a strong social identity but it may obstacle openness towards individuals coming from other places and endowed with a diverse culture (Putnam, 2000). Bridging social capital favors connections among diverse groups and individuals. The primacy of bonding over bridging may prevent openess towards minority groups (Amin, 2005). Our evidence suggests that when culture interacts with social capital it favors its bridging component over the bonding one, therefore reducing hostility towards diverse groups. By not considering the interaction term, as in column 1, we are only able to capture a negative, but not significant, effect of social capital. Instead, by considering the interaction term, we can highlight the influence exerted by culture.

Columns 3 and 4 outline estimates for the sensitivity tests. Column 3 shows that the effect of the local consumption of culture holds when we remove spatial spillovers, although the interaction between social capital and cultural consumption loses significance. Column 4 confirms the effect of cultural consumption when the share of refugees is considered among controls. Again, the interaction term loses its significance. Results also hold when we consider only the subset of extremely violent hate events consisting of severe physical attacks and damages (see Table A5, column 6 in the Appendix). Therefore, results from the Two-Way Fixed Effect model support a relevant effect of cultural consumption in decreasing hate. They also suggest a mild effect for the spatial spillovers of cultural consumption coming from the neighboring provinces. Finally, there is mild evidence of a further effect of cultural consumption channeled through its interaction with social capital, although not robust to the sensitivity tests. Nonetheless, comparing estimates in column 1 with the estimates in columns 2-4, we see that the coefficient of social capital is negative when the interaction between social capital and culture is not considered and positive otherwise. This finding deserves further investigation, as it suggests that the interaction between social capital and cultural consumption could provide a more comprehensive picture on how cultural consumption interact with the different components of social capital: the one that favors connection between diverse groups (bridging social capital) and the one that obstacles openness towards groups endowed with a diverse culture (bonding social capital) (Putnam, 2000).

Estimates account for heteroscedasticity since we cluster errors at NUTS3 level. The Wooldridge LM test shows that data does not suffer from serial correlation. The relatively short time span covered in the analysis implies a "*large N / small T*" panel, that is a larger cross-sectional (N) than time dimension in the

[5] We have tested other possible interactions between cultural consumption and the other confounders, to find non significance.

panel (T). This a priori prevents non-stationarity from affecting our estimates through spurious correlation, and at the same time three different unit root tests for panel data (the Im-Pesaran-Shin, the augmented Dickey-Fuller and the Phillips-Perron tests) confirm stationarity for the dependent variable, the treatment and the controls (See Table A7 in the Appendix). We check for cross-sectional dependance through the Pesaran test and the Friedman statistic, which support no spatial autocorrelation in the data (See Table A8 in the Appendix).

5.2 Endogeneity of cultural consumption.

Table 2: IV 2SLS panel model estimates and sensitivity tests for the effect of cultural consumption on hate events in the Italian NUTS3 areas between 2009 and 2018

	No interaction	Interaction		
	(1)	(2)	(3) No spatial spillovers	(4) Refugees
Cultural consumption	**-0.212****	**-0.283****	**-0.202****	**-0.302****
	(0.098)	**(0.112)**	**(0.088)**	**(0.150)**
Cultural consumption spillovers	-0.120*	-0.129*		-0.192**
	(0.069)	(0.069)		(0.078)
Social capital	-0.026	0.668	0.630	0.497
	(0.052)	(0.523)	(0.799)	(0.561)
Social capital*cultural consumption		-0.092**	-0.366	-0.414
		(0.039)	(0.472)	(0.485)
Controls	YES	YES	YES	YES
Refugees among controls	NO	NO	NO	YES
Time FE	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES
R-squared	0.206	0.210	0.205	0.201
Obs	1050	1050	1 060	810
Cluster	106	106	106	106
KP LM statistic p value	0.000	0.000	0.000	0.000
KP Wald F- statistic	235.665***	137.791**	81.055**	17.136***
Hansen *J* statistic p-value	0.2865	0.2935	0.3414	0.4086
IV estimated coefficient from first stage				
		a: direct effect (y = cultural consumption)		
Synthetic cultural consumption	0.818***	0.824***	0.881***	0.849***
	(0.053)	(0.056)	(0.082)	(0.066)
Social capital	0.052*	0.086	0.137*	0.128*
	(0.027)	(0.058)	(0.081)	(0.070)
Social capital*synthetic cultural consumption		-0.019	-0.041	-0.032
		(0.023)	(0.031)	(0.026)
Controls	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES
		b: indirect effect (y=social capital*cultural consumption)		
Synthetic cultural consumption		0.12	0.133*	0.161*
		(0.081)	(0.075)	(0.094)
Social capital		1.033***	1.031***	0.994***
		(0.189)	(0.182)	(0.212)
Social capital*synthetic cultural consumption		0.112***	0.074**	0.094*
		(0.027)	(0.002)	(0.04)
Controls		YES	YES	YES
Time FE		YES	YES	YES
NUTS3 FE		YES	YES	YES

Robust standard errors; coefficients statistically significant at ***1%, **5%, and *10%. The interaction term in the IV 2SLS estimation in columns 2-4 is performed following Wooldridge (2010). The first stage is performed with fixed effects and having the same set of controls as the second stage.
Controls: (i) cultural consumption spillovers, human capital, foreign population, unemployment, crime rate in columns 1-3; (ii) cultural consumption spillovers, human capital, foreign population, unemployment, crime rate, refugees in column 4

The estimates of a causal relationship between cultural consumption and hate events are summarized in Table 2[6], that details the results of the IV-2SLS panel model where cultural consumption is instrumented through the Bartik-type exogenous regressor described in section 4 and summarized by eq (2). Table 2 provides evidence of a meaningful relationship between cultural consumption and hate events that goes beyond a measure of association to provide a measure of causation. Column 1 reports estimates of the IV-2SLS when the interaction between social capital and cultural consumption is not considered, to show that an increase in cultural consumption of 1 p.p. determines a reduction in the growth of hate events amounting to 21%. The impact of cultural consumption is larger, suggesting the Two-Way Fixed Effect model underestimates its impact on hate. Estimates in column 2 support both the direct and indirect effect of cultural consumption on hate reduction, by showing a significant effect for the interaction between social capital and cultural consumption. Notably, the coefficient for the interaction term is larger and more significant. Results hold under several sensitivity tests which are summarized in columns 3-4 (for detailed results on estimates of the control variable, see Table A6 in the Appendix).

We need to rule out that reverse causation plus hate persistence could be a strong driver of the correlation. We follow Mayda et al. (2021) and we perform two tests. First, whether hate is associated with cultural consumption during the following 8 years. Second, we perform the same test for the predicted cultural consumption as given by our instrumental variable. A correlation between hate and subsequent cultural consumption might imply that places with more hate are a deterrent for consuming culture affecting subsequent cultural consumption and generating a correlation with subsequent hate that may be due to reverse causation. We find no systematic correlation between past hate and the subsequent 8-year cultural consumption, even when we use cultural consumption measured through the instrument (Table A9 in the Appendix). While cultural consumption does not happen randomly, past hate does not seem to have predictive power in determining its level.

In columns 2-4 we include the interaction between social capital and cultural consumption. Since the interaction term involves cultural consumption, it might be partially correlated with cultural consumption itself. Following Wooldridge (2010), we deal with this introducing two reduced-form equations in the estimation. In both reduced-form equations, our chosen instrument is given by the Bartik-type instrument summarized in eq (2), that predicts the actual cultural consumption as a weighted average of national patterns of cultural consumption growth (the '*shift*' in the literature on Bartik-type instruments) using as weights the *i-th* NUTS3's cultural consumption in 1955 (the '*shares*' in the literature on Bartik-type instruments). The first reduced-form equation regresses cultural consumption on the Bartik-type instrument, social capital, the interaction between the instrument and social capital and control variables.

[6] Estimation has been performed using the commands `xtivreg` and `xtivreg2` in STATA

The second reduced-form equation regresses the interaction between cultural consumption and social capital on the Bartik-type instrument, social capital, the interaction between the instrument and social capital and control variables. The structural equation is given by eq (1). Estimates are outlined in column 2.

Findings show that here an increase in 1 p.p. in the local consumption of culture determines a decrease of more than 28% in hate events, confirming that the Two-Way Fixed Effect model underestimates the impact of cultural consumption on hate. Further support to this bias for the Two-Way Fixed Effect model estimates can be found in the 2SLS-IV estimates for the interaction between social capital and cultural consumption. The estimated coefficient for the interaction of social capital with cultural consumption outlined in column 2 of Table 2 has a larger negative and highly significant coefficient, compared with the results in column 2 of Table 1.

Columns 3 and 4 show that the main finding of the relevant role of cultural consumption on reducing hate hold removing the spatial spillover of cultural consumption and introducing the relative share of refuges among controls. Similarly to the Two-Way Fixed Effect model, the interaction between cultural consumption and social capital loses significance. First stage results outline that the instruments have the expected positive sign and are always significant. The Kleibergen-Paap under identification test captured by the KP LM statistic p-value supports the relevance of the chosen instruments in explaining the endogenous regressor and that the model is identified. Estimates do not suffer from an issue of weak instruments, since the Kleibergen-Paap Wald F statistic values are above the Stock and Yogo critical values in all model specifications. The Hansen J statistic supports our models as not over-identified. The reduced-form regressions confirm that cultural consumption is partially correlated with synthetic cultural consumption and not with the interaction between synthetic cultural consumption and social capital. Similarly, the interaction between cultural consumption and social capital is partially correlated with the interaction between synthetic cultural consumption and social capital and either no correlated or mildly correlated with synthetic cultural consumption. These findings mean that the rank condition for 2SLS is satisfied. The next sections detail several robustness checks supporting the internal validity of our results.

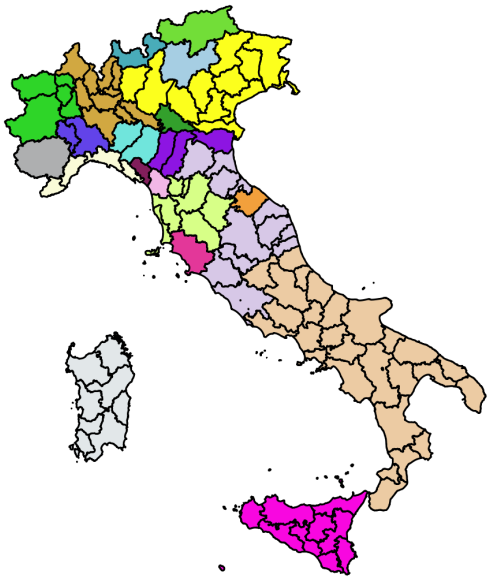
5.3 Accounting for persistent cultural norms

We check the robustness of our results accounting for the potential effect of distant historical experience, which could influence today behaviours according to extant literature showing that while some cultural features are changing, others display persistency (Becker *et al.*, 2016; Guiso, Sapienza and Zingales, 2016; Giavazzi, Petkov and Schiantarelli, 2019; Chronopoulos *et al.*, 2020; Giuliano and Nunn, 2021; Huggins *et al.*, 2021). Similarly to other works on the effect of persistent cultural norms on the Italian context, we design our proxy for the influence of historical culture using the geography of Italy prior to the unification process, which was implemented after 1861 (Di Liberto and Sideri, 2015; Guiso, Sapienza and Zingales, 2016). Differently from many European countries, Italy experienced high degree

of political and institutional fragmentation from the collapse of the Roman Empire until 1861, being divided in several states whose cultural variety is recognized as relevant for the current regional identities (Melis, 1996; Broers, 2003). Existing evidence supports an effect of the Italian pre-Unitarian political and cultural geography on current institutions (Di Liberto and Sideri, 2015), with consequences also on economic performance (Boschma, Marrocu and Paci, 2016).

We consider Italian pre-Unitarian states between 1560 and 1659, *i.e.* the geography that resulted after the Peace of Cateau-Cambrésis (1559) which ended the 65-year struggle between France and Spain for the control of Italy. This choice appears appropriate since the institutional geography resulting from the Peace of Cateau-Cambrésis lasted for nearly a century. This is a sufficiently long period for an historical legacy. Also, it is remarkably longer than any other geography of pre-Unitarian states after 1659[7]. From this geography, outlined in Figure 3, we create a set of dummies corresponding to a different pre-Unitarian state as already done by previous works (Di Liberto and Sideri, 2015; Denti and Faggian, 2020).

Figure 3: The geography of Italian pre-Unitarian states from 1560 to 1659 as resulting from the Peace of Cateau-Chambresis (1559)



We then use these pre-Unitarian state dummies to account for the potential confounding effect of persistent cultural values. We use the pre-Unitarian state dummies as fixed effect in our IV-2SLS model, and we estimate the resulting multiple fixed effect model as done in the literature (Guimarães and Portugal, 2010; Correia, 2018, 2019). Results[8], summarized in Table 3 confirm our main findings as

[7] Notably, after 1659 the geography of pre-Unitarian states experienced frequent disruptions due to the wars that characterized Europe. Already in 1700, the War of the Spanish Succession caused sudden political and institutional shifts, which ended with the Peace of Utrecht in 1713 and a new geography of pre-Unitarian states. The same happened again in 1738, following the Treaty of Vienna and in 1748 following the Treaty of Aix-La-Chapelle. Between 1796 and 1806 the Italian institutional landscape was disrupted by Napoleon's Italian Campaigns, as well as in 1815 after the Congress of Vienna.

[8] Estimation has been performed using the command `ivreghdfe` in STATA (Correia, 2018).

cultural consumption still relates negatively to hate. Also estimates for spatial consumption spillovers, social capital and the interaction between social capital and cultural consumption parallel confirm our main results.

More into details, column 1 reports that the coefficient for cultural consumption remains negative and significant when the historical dummies are considered alongside the endogeneity of cultural consumption. A 1 p.p. increase in cultural consumption reduces hate proliferation by around 21%.

Table 3: IV 2SLS panel model estimates accounting for the influence of historical culture

	No interaction	Interaction		
	(1)	(2)	(3) No spatial spillovers	(4) Refugees
Cultural consumption	**-0.211****	**-0.218****	**-0.273****	**-0.246****
	(0.096)	**(0.095)**	**(0.089)**	**(0.107)**
Cultural consumption spillovers	-0.120**	-0.122**		-0.190**
	(0.013)	(0.041)		(0.075)
Social capital	-0.026	0.087	0.631	0.117
	(0.057)	(0.089)	(1.030)	(0.071)
Social capital*cultural consumption		-0.097**	-0.556	-0.400
		(0.045)	(0.785)	(0.571)
Controls	YES	YES	YES	YES
Refugees among controls	NO	NO	NO	YES
Time FE	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES
Pre-Unitarian states FE	YES	YES	YES	YES
Obs	1050	1050	1 060	810
Cluster	106	106	106	106
KP LM statistic p value	0.028	0.031	0.087	0.066
KP Wald F- statistic	204.77***	178.800***	108.499***	168.445***
Hansen J statistic p-value	0.2865	0.3139	0.3663	0.4241
IV estimated coefficient from first stage				
		a: direct effect (y = cultural consumption)		
Synthetic cultural consumption	0.818***	0.812***	0.881***	0.832 ***
	(0.057)	(0.053)	(0.103)	(0.067)
Social capital	0.052**	0.188**	0.137*	0.234**
	(0.023)	(0.072)	(0.082)	(0.088)
Social capital*synthetic cultural consumption		-0.012	-0.041	-0.022
		(0.515)	(0.032)	(0.026)
Controls	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES
Pre-Unitarian states FE	YES	YES	YES	YES
		b: indirect effect (y=social capital*cultural consumption)		
Synthetic cultural consumption		0.120	0.133*	0.161
		(0.154)	(0.075)	(0.160)
Social capital		1.033***	1.031***	0.994**
		(0.004)	(0.182)	(0.319)
Social capital*synthetic cultural consumption		0.072**	0.074**	0.093*
		(0.001)	(0.002)	(0.03)
Controls		YES	YES	YES
Time FE		YES	YES	YES
NUTS3 FE		YES	YES	YES
Pre-Unitarian states FE		YES	YES	YES

Robust standard errors; coefficients statistically significant at ***1%, **5%, and *10%. The interaction term in the IV 2SLS estimation in columns 2-4 is performed following Wooldridge (2010). The first stage is performed with fixed effects and having the same set of controls as the second stage.
Controls: (i) cultural consumption spillovers, human capital, foreign population, unemployment, crime rate in columns 1-3; (ii) cultural consumption spillovers, human capital, foreign population, unemployment, crime rate, refugees in column 4

Again, spatial spillovers of cultural consumption have a negative and significant reduction effect on hate proliferation amounting to 12%, as shown by the negative coefficient. Also, the remaining estimates align with results from the main specification. This evidence corroborates the effect of cultural consumption in reducing hate even persistent values transmitted through historical legacy are accounted for. Post-estimation diagnostics alleviates concerns on instrumental variables. The KP LM statistic p-value suggest that the instruments are relevant predictors of the endogenous regressors and that the model is identified. Weak instruments do not seem to be an issue, given that the Kleibergen-Paap Wald F statistic values are above the Stock and Yogo critical values in all model specifications. The Hansen *J* statistic supports our models as not over-identified. From first stage results it appears that instruments have the expected positive sign and are always significant. Also, the rank condition for 2SLS is satisfied.

5.4 Other robustness checks

The results in the previous sections indicate that consuming cultural products may play a role in reducing hate even when we control for endogeneity of cultural consumption and for persistent cultural norms. Naturally, some concerns remain over the interpretation and the robustness of this result. This section will address several threats: the robustness of causal evidence with respect to the baseline year used in the design of the instrument; potential bias that may affect the instrument according to extant literature; a competing model specification. This sub-section summarizes the main results of these robustness checks.

First, we check whether estimates from the 2SLS-IV depend on the choice of the baseline year for the Bartik-type instrument, to see that it is not the case (See Table A10 columns 1-2 and Table A11 column 1 in the Appendix for the detailed estimation results with 1958 and 1961 as alternative baseline year for the instrument). Second, due to the potential bias inherent to the Bartik-type of instrument, we have also performed the 2SLS-IV estimation using the "*multiple instruments approach*" (Jaeger, Ruist and Stuhler, 2018), hence adding a lagged cultural consumption to regressors to then instrumenting for it by means of the Bartik-type instrument. Results confirms the impact of cultural consumption in reducing hate also when we account for the adjustment dynamics in cultural consumption (see Table A10 column 3 in the Appendix for the estimation results and the detailed model specification).

Third, we estimated the Arellano-Bond Difference GMM model, that is a competing model specification to account for both endogeneity of cultural consumption and the fact that hate events may display some degree of time persistency, similarly to other public opinion and attitudes (Wilkins, 2018). In practical terms, we checked whether results could change by allowing for the current level of hate to depend also on the level of hate the year before. Estimates confirm the negative impact of cultural consumption on hate, with a highly significant and negative coefficient for cultural consumption, which holds also to the inclusion of the lagged value of hate events among regressors, which has the drawback of potentially suppressing the explanatory power of other variables (Keele and Kelly, 2006) (See Table

A11 columns 2-5 in the Appendix for the estimation results). In the Arellano-Bond GMM, we also include the lag of the cultural consumption to see that it does not appear to have a meaningful influence on hate. Also, social capital and controls behave consistently with the 2SLS-IV estimates.

6. Discussion and Conclusions

This paper provides the first empirical investigation on the effect of cultural consumption on the reduction of hate events across Italian NUTS3 regions. Estimates reveal a relevant effect of consuming cultural products on reducing hate. The size of the effect is sizeable, given that increasing cultural consumption by 1 p.p. relates to 20% reduction in hate events. Since culture is the repository of the prejudices on which hate narratives are build, updating the local cultural outlook by means of consuming cultural products opens up new perspectives and helps challenging the existing stereotypes, thus breaking the hate-building process (Perry, 2001).

We have also measured the effect of spatial spillovers of cultural consumption, to check whether cultural consumption is capable also to exert an indirect effect through spatial externalities. We find evidence of a mild association showing that cultural consumption does not appear to have a strong spatial reach outside the place in which it gets consumed. Results hold to the inclusion of potential confounding features which could contribute to explain the observed intensity of hate. The role of cultural consumption on hate reduction is further confirmed when we control for potential threats to internal validity, including endogeneity, the role of persistent cultural norms and the choice of the estimation method.

Our chosen proxy to measure cultural consumption does not convey any information on the "quality" of the cultural events attended by people. This issue is a potential limitation for our results since experimental evidence on the effect of cultural consumption on hate reduction outlines that cultural products targeting tolerance have a greater impact in offsetting hate (Vezzali *et al.*, 2015; Waston *et al.*, 2019; Bond, 2021). We address this issue referring to extensive qualitative evidence showing that in our considered time-span cultural production in Italy was actively engaged in projects targeting inclusiveness and tolerance across the whole territory. Italian museums realized numerous activities on inclusiveness (Coopculture, 2015; Fondazione ISMU, 2021). Similarly figures shows that productions within theatre, dance and music targeting the topics of tolerance and openness have been supported by the Italian Ministry of Culture, foundations and regional governments and released throughout the country both in cities and towns (Bodo, Da Milano and Mascheroni, 2009; Pereira *et al.*, 2010; Italian Ministry of Culture, 2014). This qualitative evidence suggests that cultural products were remarkably tailored to address tolerance and inclusiveness, corroborating our empirical findings.

Our results support the "*indirect contact theory*" (Vezzali *et al.*, 2014; Brown and Paterson, 2016), by providing a robust and significant measure of the role of cultural products in reducing prejudice-driven

behaviours. In this respect, our results also add quantitative support to the existing small-scale experimental evidence showing that exposure to cultural products is effective in reducing hate against disempowered groups (Vezzali *et al.*, 2015; Greene *et al.*, 2018; Murrar and Brauer, 2018).

Our evidence also confirms that cultural change towards more tolerant communities can happen in a relatively short time span thanks to the innovative drive of cultural products. This result is an interesting insight for policy design. Cultural consumption can be a driver for improving the community's performance in terms of hate reduction. Therefore, policy interventions aimed at stimulating participation to cultural activities at local level could contribute to counter hate. This insight aligns with the existing approaches suggesting to combine indirect and "*soft*" approaches aimed at promoting community resilience with direct and legislative approaches in fighting hate (Gagliardone *et al.*, 2015; Bayer and Bárd, 2020; IRS, 2020). The indirect approaches, including cultural consumption, do not suffer from the drawback of interfering with freedom of speech and they also allow to avoid hatemongers to present themselves as martyrs or victims of the justice system (Bayer and Bárd, 2020).

An interesting finding refers to the effect on hate of the interaction between cultural consumption and the endowment of social capital. Estimates from our regressions provide mild support for hate reduction through the indirect effect of cultural consumption channeled by social capital. Notably, the direct effect of social capital, although not significant, is positive, meaning that high levels of social capital are associated to high levels of hate. These results relates to existing evidence on Italy showing that social capital is associated to hostility towards refugees (Fratesi, Percoco and Proietti, 2019), suggesting a strong bonding component which favors intolerance. Our findings confirm the bonding component, through the direct effect of social capital on hate, at the same time showing that the interaction with cultural consumption can disrupt the bonding component favoring the bridging component, which promotes tolerance. This point deserves further investigation that goes beyond the scope of the present paper.

The paper targets only Italy, therefore there are limitations regarding its external validity. These limitations are also due to the key issue of how to measure hate. To this regards, countries have different legislations addressing hate and hate crimes, making cross-country analysis extremely difficult (OSCE-ODHIR, 2017).

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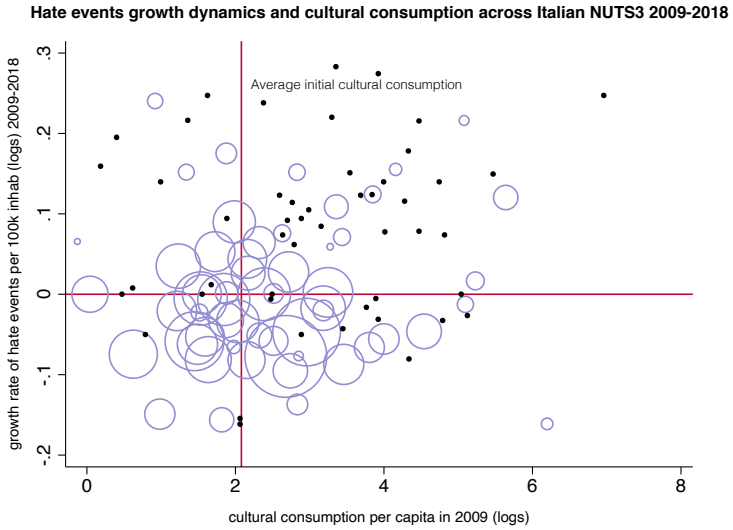
Appendix

Figure A1



The graph outlines data on the initial level of cultural consumption per capita (horizontal axis), the annual growth rate of hate events per 100 000 inhabitants (vertical axis) and the corresponding variation in cultural consumption, with the area of the lavender circle being proportional to the percentage increase in cultural consumption per capita and the dark circle corresponding to a decrease in cultural consumption per capita between 2009 and 2018. The distribution of NUTS3 with respect to their initial level of cultural consumption suggests that high initial levels of cultural consumption do not prevent a place to experience increasing hate events if further culture is not consumed. The NUTS3 characterized by a decrease in cultural consumption are clustered in the upper part of the graph. They tend to experience higher growth rates of hate events between 2009 and 2018. The NUTS3 with a positive increase in cultural consumption per capita are mainly clustered in the lower part of the graph, where the growth rate of hate events is negative. These patterns suggest that increased cultural consumption is related to a decrease in the growth of hate events.

Table A1:Variables description. Each variable is measured at NUTS3 level for Italy with yearly observations between 2009 and 2018

Variable	Definition	Source
Hate	Number of hate events for 100 000 inhabitants	Lunaria
Cultural consumption	Audience of cultural events (paid and free admissions) weighted by population	SIAE
Cultural consumption spatial spillovers	Audience of cultural events (paid and free admissions) in the 4 nearest provinces weighted by population	SIAE
Human capital	Share of population aged 25-64 with at least high school diploma	ISTAT
Foreign population	Share of foreign population	ISTAT
Unemployment	Share of unemployed people	ISTAT
Crime rate	Reported crimes for 100 000 inhabitants	ISTAT
Refugees	Refugees for 100 000 inhabitants	SPRAR
Social capital	Synthetic indicator designed through Principal Component Analysis (PCA) on the following local features:	
	• Selective garbage collection on the total amount of garbage weighted by the quality of the environmental policy of local governments;	ISPRA – LUISS Fondazione Etica
	• Number of partners of cooperatives (mutual societies) per 100 000 inhabitants;	ISTAT
	• Share of population aged above 65 benefitting from public elderly care and services (ease of access to service);	ISTAT
	• Share of population aged below 3 benefitting from public nursery (ease of access to service);	ISTAT
	• Number of suicides per 100 000 inhabitants;	ISTAT
	• Share of population aged 15-29 which is not in employment, education and training;	ISTAT
	• Number of protests per 100 000 inhabitants	ISTAT
Weighting factors		
Population	Resident population	ISTAT
Index of touristic attractiveness	Staying of tourists (measured in days) per populations	ISTAT
Instrumental variable components		
1955-2018 expenditure in culture	Money spent in cultural events per inhabitants at NUTS3 level	SIAE Historical Archives
1955-1964 population	Resident population at NUTS3 level	ISTAT Historical Archives
1955-2019 CPI index	Consumer Price Index	ISTAT

Table A2: Descriptive statistic

Variable (in logs)	Mean	SD	Min	Max	Observations
Hate	0.5505	0.4287	0	2.4188	1 060
Cultural consumption	1.3859	0.6129	-1.4922	3.2282	1 060
Cultural consumption spatial spillovers	2.8195	0.5110	0.3175	4.3725	1 050
Human capital	4.0399	0.1370	3.5918	4.3268	1 060
Foreign population	1.7779	0.6673	-2.7342	2.8603	1 060
Unemployment	2.2651	0.4837	0.7374	3.4486	1 060
Crime rate	8.1476	0.3646	6.4007	9.0457	1 060
Refugees°	0.2962	5.3851	-9.2103	6.2351	820
Social capital index 1	0.0268	1.0046	-2.4086	2.3677	1 060
Social capital index 2	-0.0018	0.9875	-2.2589	5.6566	1 060
Population	12.9393	0.7094	11.3531	15.287	1 060
Touristic attractiveness	1.4245	1.056	-1.281	4.140	1 060
1955 cultural expenditure	1.7785	1.0993	-0.9528	4.5596	1 060

° Data on refugees account for yearly observation for each NUTS3 for 2010 and 2014-2018. There are missing data for 2009, 2011 and 2013.

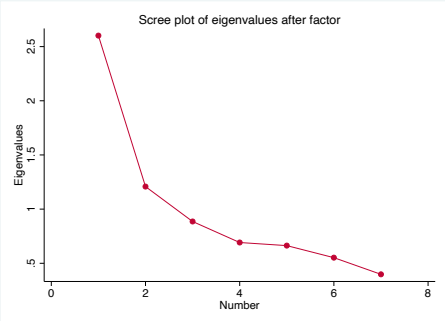
Social Capital index: Principal Component Analysis (PCA).

Table A3. Principal component analysis: Eigenvalues of the correlation matrix on the Italian NUTS3

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	**2.60141**	**1.39346**	**0.3716**	**0.3716**
Factor2	**1.20795**	**0.32222**	**0.1726**	**0.5442**
Factor3	0.88573	0.19397	0.1265	0.6707
Factor4	0.69176	0.02863	0.0988	0.7696
Factor5	0.66312	0.11125	0.0947	0.8643
Factor6	0.55187	0.15372	0.0788	0.9431
Factor7	0.39815	.	0.0569	1

PCA transforms a set of possibly correlated variables into a smaller set of uncorrelated variables called principal components. Indicators that measure a similar underlying concept cluster onto a component and are weighted within each component relative to the variance explained. Factor 1 and Factor 2 can be retained for analysis, as they reported an eigenvalue greater than 1

Figure A2. Principal component analysis: Scree plot.



The point of inflexion of the graph occurs at two components supporting findings for Table A1. Table A1 and Figure A2 suggest a cut-off point of two components, giving two indexes for social capital.
In the paper we present estimates referring to one of these two indexes, given that results do not change when the other index is considered.

Table A4. Principal component analysis: coefficients of each variable that contributes to each component.

Variable	PC1	PC2
elderly public care	0.0340	0.8456
nursery availability	0.7275	-0.0041
youth strain	-0.7845	-0.1836
protests	-0.4405	-0.4304
cooperatives	0.6602	0.4575
suicide	-0.5051	-0.3594
share of recycling	0.7020	0.1153

TableA5. Two-way fixed effect panel model detailed estimates and sensitivity tests for the effect of cultural consumption on hate events in the Italian NUTS3 areas between 2009 and 2018,

	(1)	(2)	(4) No spatial spillovers	(5) Refugees	(6) Physical attacks and damages
Cultural consumption	-0.147**	-0.165**	-0.175***	-0.172**	-0.098*
	(0.073)	(0.074)	(0.064)	(0.08)	(0.051)
Cultural consumption spillovers	-0.133*	-0.13*		-0.185**	-0.02
	(0.073)	(0.073)		(0.076)	(0.058)
Social capital	-0.031	0.077	0.081	0.116	0.008
	(0.053)	(0.093)	(0.094)	(0.105)	(0.066)
Social capital*cultural consumption		-0.042*	-0.04	-0.043	-0.002
		(0.024)	(0.024)	(0.028)	(0.018)
Human capital	0.083	0.122	0.095	0.299	-0.11
	(0.314)	(0.311)	(0.317)	(0.355)	(0.213)
Foreign pop	0.105***	0.107***	0.102***	0.121***	0.021
	(0.028)	(0.027)	(0.028)	(0.024)	(0.027)
Unemployment	0.175*	0.179*	0.191*	0.219*	0.116*
	(0.098)	(0.099)	(0.099)	(0.12)	(0.069)
Crime rate	0.112	0.111	0.133	0.215	0.057
	(0.1)	(0.1)	(0.098)	(0.151)	(0.091)
Refugees				0.001	
				(0.005)	
Time FE	YES	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES	YES
R-squared	0.207	0.210	0.204	0.202	0.084
Obs	1 050	1 050	1060	810	1 050
Cluster	106	106	106	106	106
LM test autocorrelation	0.1978	0.1952	0.1366	0.4329	

Robust standard errors; coefficients statistically significant at ***1%, **5%, and *10%.

Table A6: IV 2SLS panel model detailed estimates and sensitivity tests for the effect of cultural consumption on hate events in the Italian NUTS3 areas between 2009 and 2018

	No interaction	Interaction		
	(1)	(2)	(3) No spatial spillovers	(5) Refugees
Cultural consumption	-0.212**	-0.283**	-0.202**	-0.302**
	(0.098)	(0.112)	(0.088)	(0.150)
Cultural consumption spillovers	-0.120*	-0.129*		-0.192**
	(0.069)	(0.069)		(0.078)
Social capital	-0.026	0.668	0.630	0.497
	(0.052)	(0.523)	(0.799)	(0.561)
Social capital*cultural consumption		-0.092**	-0366	-0.414
		(0.039)	(0.472)	(0.485)
Human capital	0.078	0.328	0.289	0.522
	(0.31)	(0.385)	(0.435)	(0.513)
Foreign pop	0.108***	0.117***	0.110**	0.122***
	(0.027)	(0.031)	(0.035)	(0.024)
Unemployment	0.17*	0.178	0.189*	0.214*
	(0.096)	(0.111)	(0.109)	(0.126)
Crime rate	0.118	0.097	0.120	0.120
	(0.099)	(0.126)	(0.121)	(0.216)
Refugees				0.0004
				(0.005)
Time FE	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES
R-squared	0.206	0.210	0.205	0.201
Obs	1050	1050	1 060	810
Cluster	106	106	106	106
KP LM statistic p value	0.000	0.000	0.000	0.000
KP Wald F- statistic	235.665***	137.791**	81.055**	17.136***
Hansen *J* statistic p-value	0.2865	0.2935	0.3414	0.4086
IV estimated coefficient from first stage				
		a: direct effect (y = cultural consumption)		
Synthetic cultural consumption	0.818***	0.824***	0.881***	0.849***
	(0.053)	(0.056)	(0.082)	(0.066)
Social capital	0.052*	0.086	0.137*	0.128*
	(0.027)	(0.058)	(0.081)	(0.070)
Social capital*synthetic cultural consumption		-0.019	-0.041	-0.032
		(0.023)	(0.031)	(0.026)
Controls	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES
		b: indirect effect (y=social capital*cultural consumption)		
Synthetic cultural consumption		0.12	0.133*	0.161*
		(0.081)	(0.075)	(0.094)
Social capital		1.033***	1.031***	0.994***
		(0.189)	(0.182)	(0.212)
Social capital*synthetic cultural consumption		0.112***	0.074**	0.094*
		(0.027)	(0.002)	(0.04)
Controls		YES	YES	YES
Time FE		YES	YES	YES
NUTS3 FE		YES	YES	YES

Robust standard errors; coefficients statistically significant at ***1%, **5%, and *10%. The interaction term in the IV 2SLS estimation in columns 2-4 is performed following Wooldridge (2010). The first stage is performed with fixed effects and having the same set of controls as the second stage.

Table A7: NUTS3 unit root tests

	IPS	IPS trend	ADF	ADF trend	Phillips-Perron	Phillips-Perron trend
Hate events	-10.7433***	-9.7802 ***	350.8751***	469.7389***	571.5248***	580.8032***
Cultural consumption	-5.4181***	-2.9299**	349.7234***	359.1308***	359.2287***	280.2657**
Spatial weighted average	-4.5890***	-6.9222***	677.6189***	683.5166***	338.4287***	508.9833***
Human capital	-4.1554***	-1.0853	242.0944*	544.9776***	200.2728	354.2178***
Crime rate	-12.7826***	-14.5788***	68.1462	473.1573***	4123.3066***	6795.3455***
Foreign resident pop	-2.0695**	-0.8731	209.1346	85.3832	434.7490***	50.6907
Unemployment	-5.3354***	8.2496	354.6257***	82.7496	314.5177***	114.3894
Social Capital index 1	-8.4458***	-5.647***	249.1875**	194.6556	319.2732***	254.4785*
Social Capital index 2	-9.6143***	-5.3279***	344.1416***	150.7372	416.6813***	308.3305***

* significant at 10%; ** significant at 5%; *** significant at 1%.IPS – Im-Pesaran-Shin test for unit roots; the W[t–bar] test statistic is standard–normally distributed under the null hypothesis of non-stationarity; ADF Augmented Dickey Fuller test for unit roots.

Table A8: Cross-sectional dependence in the two-way panel model with fixed effects

Pesaran test	Friedman test
average absolute correlation of the residuals	Pr value
0.200	0.980
The Friedman test strongly support the absence of spatial autocorrelation. The Pesaran test shows that the correlation among residuals is indeed low	

Table A9: Falsification test to assess reverse causality in the 2SLS IV estimates following Mayda et al. (2021). Estimates of the correlation between lagged hate and change in cultural consumption

	(1) Change in Cultural consumption	(2) Change in Synthetic Cultural consumption
Hate events 8 years ago	-0.070	-0.058
	(0.050)	(0.044)
Controls	YES	YES
NUTS3 FE	YES	YES
Time FE	YES	YES
Observations	208	208
R-squared	0.220	0.187
Clusters	106	106

Robust standard errors; coefficients statistically significant at ***1%, **5%, and *10%..
Controls are: human capital, unemployment, crime rate, foreign population, social capital and cultural consumption spillovers

Table A10 columns 1-2 shows estimate when the Bartik instrument is designed having 1958 and 1961 as baseline year respectively. Column 3 present estimates from the multiple instruments approach used to account for potential bias of the Bartik estimator (Jaeger, Ruist and Stuhler, 2018).

Table A10: Robustness checks for the 2SLS IV with FE. 1958 as baseline year for the Bartik-type instrument (column 1). 1961 as baseline year for the Bartik-type instrument (column 2). Using the multiple instruments approach to account for potential dynamic bias in the Bartik-type instrument (column 3)

	(1) 1958 as baseline year for IV	(2) 1961 as baseline year for IV	(3) Multiple instruments
Cultural consumption (*instrumented*)	-0.292***	-0.196**	-0.328**
	(0.108)	(0.099)	(0.121)
Lagged past cultural consumption instrument (*instrumented*)			-0.011
			(0.172)
Cultural consumption spillovers	-0.108	-0.127*	-0.016
	(0.072)	(0.069)	(0.048)
Social capital	0.103	0.082	0.817
	(0.08)	(0.077)	(0.874)
Social capital* cultural consumption (*instrumented*)	-0.106***	-0.094**	-0.763
	(0.039)	(0.039)	(0.741)
Lagged social capital* past cultural consumption (*instrumented*)			-0.008
			(0.0907)
Controls	YES	YES	YES
Time FE	YES	YES	YES
NUTS3 FE	YES	YES	YES
R-squared	0.208	0.211	0.1124
Obs	1050	1050	839
Cluster	106	106	106
KP LM statistic p value	0.000	0.0000	0.0001
KP Wald F- statistic	16.819**	262.279***	
F test of excluded instruments			31.74
Sanderson-Windmeijer multivariate F test of excluded instruments			21.96
IV estimated coefficient from first stage			
a: direct effect (y = cultural consumption)			
Synthetic cultural consumption	0.383***	1.042***	1.035***
	(0.066)	(0.0523)	(0.071)
Synthetic cultural consumption *lagged*			0.013
			(0.037)
Social capital	0.260***	0.075**	0.182
	(0.064)	(0.034)	(0.065)
Social capital*synthetic cultural consumption	-0.026	-0.027	0.069
	(0.017)	(0.016)	(0.063)
Social capital*synthetic cultural consumption *lagged*			0.012
			(0.009)
b: indirect effect (y=social capital*cultural consumption)			
Synthetic cultural consumption	0.013	0.010	0.068
	(0.039)	(0.085)	(0.119)
Synthetic cultural consumption *lagged*			0.059
			(0.074)
Social capital	1.211***	1.176***	0.975***
	(0.131)	(0.127)	(0.225)
Social capital*synthetic cultural consumption	0.032**	0.029**	0.069**
	(0.016)	(0.014)	(0.033)
Social capital*synthetic cultural consumption *lagged*			0.020
			(0.028)
c: direct effect lagged (y = cultural consumption lagged)			
Synthetic cultural consumption			0.131
			(0.117)
Synthetic cultural consumption *lagged*			0.700***
			(0.054)
Social capital			0.091
			(0.056)
Social capital*synthetic cultural consumption			0.041*
			(0.024)
Social capital*synthetic cultural consumption *lagged*			0.018
			(0.023)
d: indirect effect lagged (y=social capital*cultural consumption lagged)			
Synthetic cultural consumption			0.162
			(0.125)
Synthetic cultural consumption *lagged*			0.109
			(0.128)
Social capital			0.186**
			(0.083)
Social capital*synthetic cultural consumption			0.056
			(0.038)
Social capital*synthetic cultural consumption *lagged*			0.422***
			(0.044)

a,b,c,and d. are performed with NUTS3 and time fixed effects and having the same set of controls as the structural form equation. Robust standard errors; Coefficients statistically significant at ***1%, **5%, and *10%.

More into details, column 3 of Table A10 provides estimates for the structural equation below

$$lnhate_{it} = \alpha + \delta_1 lnculture_{it} + \delta_2 lnculture_{it-1} + \gamma_1 lnSpillcult_{it} + \nu_{it}\Omega_{it} + \mu_i + \tau_t + \vartheta_{it} \quad \text{(A1)}$$

The instruments are given by: eq.(2) and its lagged version $z_{it-1} = q_i g_{t-1}^{IT}$, the interaction of eq.(2) with social capital and the interaction of $z_{it-1} = q_i g_{t-1}^{IT}$with social capital. The instruments need to have enough variation to detect the underlying dynamics separately, which is assessed through the underidentification test measured through the Kleinbergen-Paap LM statistic (Jaeger, Ruist and Stuhler, 2018). By considering respectively cultural consumption in 1961 and in 1955 as instruments, the under-identification test is satisfied. Table A10, column 3 shows the results suggesting that the short-run effect and the longer-term effect move in the same direction, hence confirming our main findings. Results from column 3 are also consistent with the critiques to the Bartik-type instrument showing that avoiding to control for dynamic adjustment lead to biased estimates (McKenzie, 2018). The first stage is performed with NUTS3 and time fixed effects and having the same set of controls as the second stage.

Table A11: Detailed estimates for the robustness checks. 2SLS with 1958 as baseline year for the Bartik-type instrument (column 1) and Arellano-Bond Difference GMM (columns 2-5)

	2SLS IV	Arellano-Bond Diff GMM			
	(1) 1958 as baseline year for IV	(2) No interaction	(3) Interaction	(4) No spatial spillovers	(5) Refugees
L1 Hate		0.154**	0.115**	0.125**	0.071
		(0.059)	(0.049)	(0.057)	(0.059)
Cultural consumption	-0.292***	-1.159**	-0.935**	-1.315***	-1.319**
	(0.108)	(0.442)	(0.406)	(0.373)	(0.541)
L1 Cultural consumption		-0.65	-1.066**	-0.816	-0.087
		(0.662)	(0.429)	(0.539)	(0.535)
Cultural consumption spillovers	-0.108	-0.229	-0.116	-0.116	-0.041
	(0.072)	(0.162)	(0.116)	(0.116)	(0.216)
Social capital	0.103	-0.009	0.500***	0.404*	0.634***
	(0.08)	(0.074)	(0.185)	(0.213)	(0.216)
L1 Social capital			0.334***	0.186	0.074
			(0.123)	(0.155)	(0.124)
Social capital*cultural consumption	-0.106***		-0.145***	-0.113*	-0.163***
	(0.039)		(0.042)	(0.066)	(0.059)
L1 Social capital*cultural consumption			-0.037	-0.065	0.021
			(0.052)	(0.06)	(0.054)
Human capital	0.117	0.495	0.496	0.53	0.636
	(0.304)	(0.36)	(0.344)	(0.359)	(0.432)
Foreign pop	0.113***	0.171	0.157***	0.22***	0.155**
	(0.027)	(0.126)	(0.042)	(0.074)	(0.068)
Unemployment	0.167*	0.092	0.322**	0.142	0.332**
	(0.095)	(0.123)	(0.125)	(0.138)	(0.167)
Crime rate	0.121	0.083	0.048	0.047	0.675*
	(0.100)	(0.296)	(0.258)	(0.276)	(0.345)
Refugees					0.001
					(0.008)
Time FE	YES	YES	YES	YES	YES
NUTS3 FE	YES	YES	YES	YES	YES
R-squared (within)	0.208				
Obs	1050	834	834	834	504
Cluster	106	106	106	106	106
Hansen *J* statistic p-value	0.8742	0.099	0.109	0.177	0.230
KP LM statistic p value	0.000				
KP Wald F- statistic	16.819**				
AR(1) t statistic		-4.46	-6.48	-4.95	-4.86
AR(1) t statistic p value		0.006	0.000	0.000	0.000
AR(2) t statistic		1.90	1.76	1.94	1.46
AR(2) t statistic p value		0.67	0.79	0.70	0.143
Number of instruments		29	50	43	51
IV estimated coefficient from first stage					
a: direct effect (y = cultural consumption)					
Synthetic cultural consumption	0.383***				
	(0.066)				
Social capital	0.260***				
	(0.064)				
Social capital*synthetic cultural consumption	-0.026				
	(0.017)				
b: indirect effect (y=social capital*cultural consumption)					
Synthetic cultural consumption	0.013				
	(0.039)				
Social capital	1.211***				
	(0.131)				
Social capital*synthetic cultural consumption	0.032**				
	(0.016)				

Robust standard errors; coefficients statistically significant at ***1%, **5%, and *10%. The interaction term in the IV 2SLS estimation in columns 1 is performed following Wooldridge (2010). The first stage is performed with fixed effects and having the same set of controls as the second stage.Controls in columns 1-4 are: human capital, foreign population, crime rate, unemployment. Controls in column 5 are: human capital, foreign population, crime rate, unemployment, refugees.
All GMM specifications are estimated with two-step estimation and Windmeijer correction; The coefficient on the lagged dependent variable in all the considered GMM specification lies within the range for dynamic stability. Columns (2)-(5): hate and cultural consumption are endogenous; columns (3)-(5): the interaction term and social capital are endogenous.