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The Causal Effect of Watching TV on Material Aspirations: Evidence from the "Valley of the Innocent"

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The Causal Effect of Watching TV on Material Aspirations: Evidence from the "Valley of the Innocent"

Abstract

The paper addresses the question of whether TV consumption has an impact on material aspirations. We exploit a natural experiment that took place during the period in which Germany was divided. Owing to geographical reasons, TV programs from the Federal Republic of Germany could not be received in all parts of the German Democratic Republic. Therefore, a natural variation occurred in exposure to West German television. We find robust evidence that watching TV is positively correlated with aspirations. Our identification strategy implies a causal relationship running from TV to aspirations. This conclusion resists various sets of alternative specifications and samples.

Keywords: natural experiment, TV consumption, material aspirations

JEL Classification: C26, D12, I31

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Der kausale Effekt des Fernsehens auf materielle Einstellungen: Evidenz aus dem ‚Tal der Ahnungslosen'

Zusammenfassung

Der Beitrag adressiert die Frage, ob Fernsehkonsum einen Einfluss auf materielle Einstellungen ausübt. Die Analyse benutzt ein natürliches Experiment, welches während der deutschen Teilung stattfand. Aus topographischen Gründen konnte das Fernsehprogramm der BRD nicht in allen Teilen der DDR empfangen werden. Deshalb gibt es eine exogene Variation mit Blick auf die Verfügbarkeit von Fernsehprogrammen. Wir finden klare Belege dafür, dass der Konsum westdeutscher Programme positiv mit pro-materialistischen Einstellungen korreliert ist. Die Identifikationsstrategie impliziert, dass diese Korrelation als kausaler Einfluss des Fernsehens interpretiert werden kann. Unser Ergebnis erweist sich als robust gegenüber Variationen der Spezifikation und der Daten.

Schlagwörter: natürliches Experiment, TV-Konsum, materielle Einstellungen

JEL-Klassifikation: C26, D12, I31

1. Introduction

In recent decades the economics discipline has shown a growing interest in the determinants and formation of preferences. Few papers have focused on the link between television (TV) consumption and preferences (see, e.g., Jensen and Oster 2009; Chong and La Ferrara 2009), however – although television is available all over the world and a huge amount of time is spent consuming television programs.[1] In this paper we analyze the impact of TV consumption on one particular dimension of preferences: material aspirations. We answer the questions of whether there is a causal effect of watching TV on preferences, or whether TV consumption is dissimilar solely because of different initial preferences.

Material aspirations seem to be a crucial determinant for individual well-being and happiness (Easterlin 2001a). Several papers showed that life satisfaction can be explained by the gap between (material) achievement and aspirations. In his analysis of welfare and income aspirations, Stutzer (2004) found that higher aspirations have a negative impact on life satisfaction. Income aspirations, in turn, increase with personal income, and a higher average income in the community. That is, individuals' adaptation to consumption, and social comparisons form aspirations. Knight and Gunatilaka (2012) found similar results for rural China.

Another branch of literature unearths the role of TV in individual well-being. For example, Frey, Benesch, and Stutzer (2007) tested whether individuals with incomplete self control watched too much TV. They worked from the premise that while watching TV serves immediate benefits and is characterized by very low marginal costs, benefits from social contacts or education are experienced in the future, and therefore are likely to be underestimated. They demonstrated that overconsumption of watching TV by people with high opportunity costs of time (self-employed, persons in high positions) is negatively correlated with life satisfaction. They went on to show that (heavy) TV viewing is correlated with subjective preferences such as the importance of being rich or financial satisfaction. The effect of these preferences on life satisfaction itself was statistically significant. In contrast, Bruni and Stanca (2008) investigated whether watching television has a crowding out effect on interpersonal relationships, which in turn affect subjective well-being. On the one hand, watching television directly influences time potentially spent with friends; on the other, it indirectly affects relational goods via raising consumption preferences that in turn lead to overinvestment in income-producing activities, and an underestimation of the relative importance of relational goods. They found that television viewing is negatively associated with the consumption of relational goods. Relational goods, in turn, have a positive impact on life satisfaction. Therefore, they deduced that television viewing has a negative effect on individual life satisfaction. Based on the data used by Bruni and Stanca (2008), Kataria and Regner (2011) explored the direct link between life satisfaction and TV viewing. In contrast to the findings of Frey, Bensch, and Stutzer (2007) and of Bruni and Stanca (2008), their results pointed to a positive impact on individual happiness from watching

1 In 2010, European people watched on average 228 minutes of TV per day, led by Serbia with 316 minutes. The average in the United States was 283 minutes (IP Network 2011).

TV. However, when using a subsample of European countries this positive effect was insignificant.

In an attempt to examine the effects of watching TV on the aspirations of individuals, Bruni and Stanca (2006) showed that the effect of higher income on life satisfaction is lower for heavy TV watchers. They argued that "that television viewing reduces the effect of income on life satisfaction by producing higher material aspirations, enhancing both adaptation and positional effects" (p. 210). That is, they presume that TV viewing increases aspirations which in turn negatively affect happiness. Our work extends recent research by exploring the direct link between watching television, and income and consumption aspirations. That is, while Bruni and Stanca (2006) analyzed whether an increase in income has a different effect on life satisfaction for heavy TV users compared to occasional TV users, we directly explore the influence of watching TV on aspirations. We investigate whether values, lifestyle or products displayed on TV affect one's material preferences.

We improve on existing studies by identifying the causal link between watching Western TV programs and preferences by exploiting the geographical variation of the Western TV signal strength in the German Democratic Republic (GDR). In previous studies the correlation between watching TV and well-being did not necessarily imply causation. Kataria and Regner (2011, p. 56) even pointed out that "like the model specifications in Frey, Benesch and Stutzer (2007) as well as in Bruni and Stanca (2006), the analysis in this note assumes exogenous regressors. Endogeneity and reversed causality are potentially problematic and therefore one should in general be cautious when interpreting non-experimental data like ours. Unfortunately, we do not have sufficient data to model the variables that potentially might be endogenous (like the related articles)." Similarly Frey, Benesch and Stutzer (2007, p. 295) noted that the causality issue "cannot be resolved, neither with an extensive set of control variables in a multiple regression analysis nor with panel data. Ideally, one would need information about exogenous changes in the opportunities for TV consumption, […]."[2]

Fortunately, we can identify the ideal situation for "exogenous changes in the opportunities for TV consumption" in a natural experiment that took place at the time Germany was still divided. While many studies have used the division and separation of Germany as a natural experiment to identify differences in behavior or beliefs resulting from the exposure to different political and economic systems (see, e.g., Alesina and Fuchs-Schuendeln 2007, Redding and Strum 2008, Bauernschuster and Rainer 2012), we make use of a natural experiment within this natural experiment. Owing to the positioning of transmitters, TV programs from the Federal Republic of Germany (FRG) could not be received in all parts of the GDR. Therefore a natural variation in West

2 Bruni and Stanca (2008) try to overcome their endogeneity problem, namely that high levels of relationality can cause less TV watching, by applying IV techniques. As instrument for TV consumption the variable "importance of television" is used. However, it is questionable whether the importance of watching TV is orthogonal to social contacts. An (inherent) aversion to social contacts might be directly related to a high preference for solitary activities that in turn causes a high rating of TV consumption. In such a scenario the TV effect measures the "inherent aversion" effect. Indeed, the over-identification restriction test infers that their instruments are not valid for four out of five measures of relational goods (as family or friendship networks).

German television exposure occurred, dividing the population of the GDR into a treatment group and control group. To our knowledge, we are the first to make use of an exogenous variation in the opportunity of watching TV to identify a causal relationship between TV consumption and aspirations using instrumental variable estimators. In this study we rely on unique survey data collected in the GDR which became available after reunification. The seminal paper of Kern and Hainmueller (2009) applies the same empirical design to study the political impact of foreign media on public support for the East German authoritarian regime.

The remainder of the paper is structured as follows. In section 2 we illustrate how watching TV might affect aspirations. In section 3, we firstly describe the TV content on both sides of the Iron Curtain and discuss the natural experiment; secondly we discuss the assumptions for identification; finally we illustrate the applied data sets. In section 4 we present our results and demonstrate the validity of the analysis. Section 5 concludes.

2. Watching TV and aspirations

In the literature of psychology, studies on the possible effects of TV are well established. Most research is grounded in the so-called cultivation theory (Gerbner et al. 2002) which assumes that the world of television differs significantly from reality and affects the attitudes of viewers. "Research showed that consumers often use information from television to construct perceptions of social reality including the prevalence of affluence. Heavier viewers tend to believe luxury products and services to be more commonplace than they actually are" (Shrum, Burroughs, and Rindfleisch 2005, p.473).

With a focus on the determinants of aspirations, the economics literature identifies two main processes that shape aspirations (Stutzer 2004). First, individual aspirations are driven mainly by comparisons. As early as half a century ago, Festinger (1954) pointed out that humans routinely compare themselves to others. The idea that relative income impinges on welfare dates back at least to Veblen (1899). Similarly, Duesenberry (1949) claimed that relative consumption rather than absolute consumption determines utility. Fehr and Fischbacher (2002) showed that concerns for fairness and reciprocity influence behavior and ignoring them fails to explain economic outcomes. Clark and Senik (2010) providing evidence for an effect on happiness of income comparisons, Eibner and Evans (2005) who examined the interplay between relative deprivation and health by looking at the impact of relative deprivation on a variety of health-related habits, and Luttmer (2005) who analyzed the effect of neighbors' income on own well-being, are recent examples of empirical studies that demonstrate the importance of relative concerns. The importance of relative considerations can also explain why increasing real incomes in developed countries are not perceived to increase average happiness, though income and happiness are positively related on the individual level (see Clark, Frijters, and Shields 2008). Second, aspirations are formed by past income and consumption. Aspirations rise with consumption and income. Individuals grow used to their consumption habits and adapt to higher income and consumption (Stutzer 2004).

Linking psychological and economic research, we expect watching TV to affect aspirations through the following channels. Firstly, since TV presents a variety of the newest products, especially via advertisements, watching TV is likely to affect desires for these products, and, at the same time, to cause dissatisfaction with existing consumer goods as a result of continuous comparison to better and improved products (Bruni and Stanca 2006). Secondly, watching TV affects reference groups: movies and television series offer comparisons with new and wealthier reference groups (Jensen and Oster 2009). That is, income and consumption comparisons take place not only with viewers' actual reference group (relatives, friends, neighbors, colleagues, etc.) but also with a virtual reference group consisting of television characters.

3. Empirical analysis

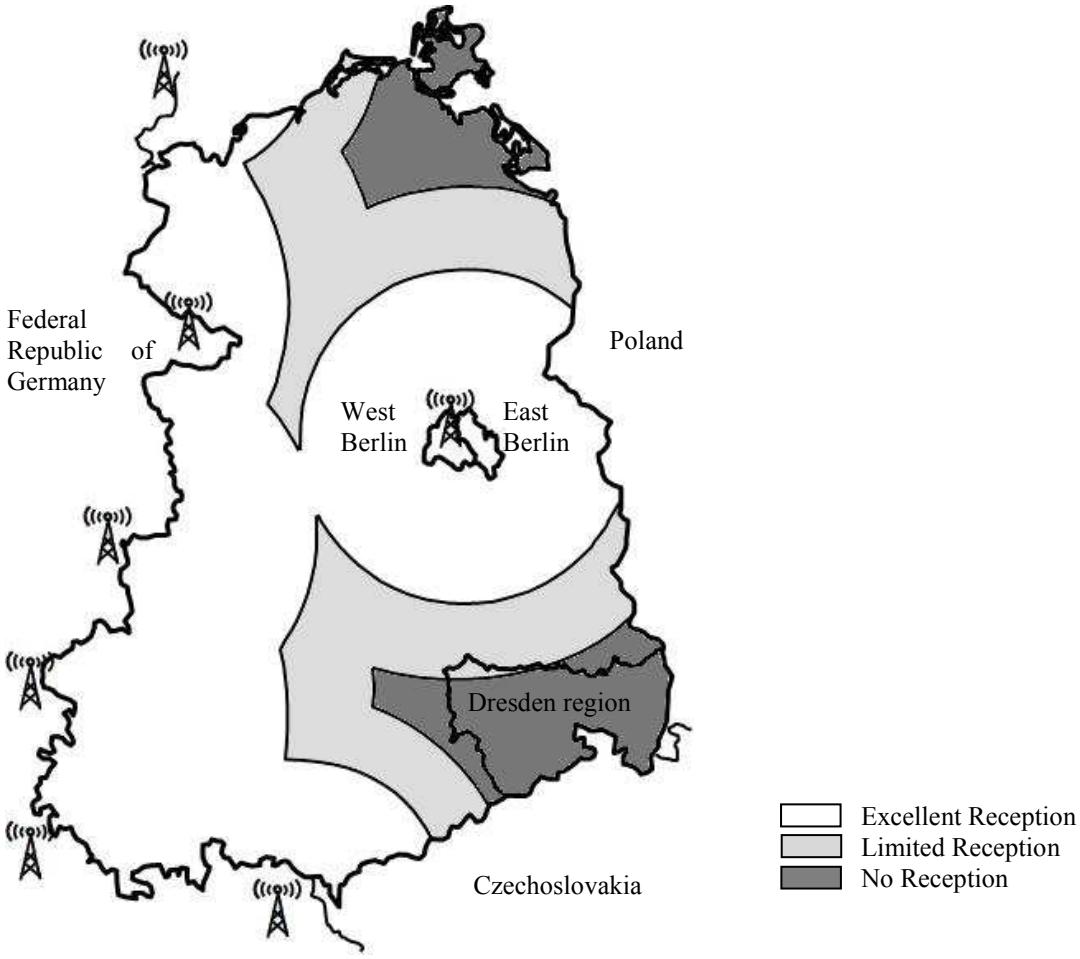
3.1 A natural experiment within a natural experiment

Watching TV might affect viewers' attitudes; however, it is also conceivable that individuals with high aspirations are more likely to watch TV, especially if TV programs depict exclusive consumption possibilities and wealthier comparison groups. Conversely, it is possible that individuals with low aspirations watch TV excessively simply for entertainment owing to low opportunity costs. It is therefore difficult to determine a causal link rather than a simple correlation between TV consumption and aspirations. We address the problem of self-selection by exploiting a natural experiment conducted in the Eastern part of the divided Germany. Owing to exogenous variations in the signal strength we can identify two comparable groups with different access to TV broadcasting. While one group, the control group, could only receive East German TV channels, reflecting an anti-capitalist ideology, the other group, the treatment group, was exposed to West German, consumption oriented TV content as well.

As a consequence of the separation of Germany into two countries following WWII, TV broadcasting developed in a diverse manner. While in West Germany public broadcasting services were founded under the control of the United States, the United Kingdom and France, East Germany established its own TV stations based on the Soviet model. East and West German TV provided different topics, information and programs. In comparison to West German TV, state-controlled East German TV aired little or no advertising. Because of the centrally planned economy, there was almost no competition between brands. In 1975, television programs became completely free of advertisements. Moreover, East German TV aired no programs which offered an insight into a much wealthier and prettier world. Actors pursued no individualistic interests; material preferences were depicted in a rather negative way (see, e.g., Schültzke 2005; Trültzsch 2009; Pfau et al. 2010). Generally, East German TV did not intend to raise consumption preferences. In contrast, West German TV programs offered a many different advertisements and game shows presenting a variety of new products. Movies and series emphasized material values, the role of wealth in subjective well-being, and individualistic lifestyles. In an analysis of 67 family series in 1990, Weiderer and Faltenbacher (1994) found that over half the characters lived in a dream world of luxury and wealth. Three quarters belonged to the upper class. In a program study made 15

years earlier, Küchenhoff (1975) found that (young) characters were consumption oriented. These huge differences in terms of TV content contributed to the fact that East Germans had a much stronger desire to watch West German TV than East German TV.[3]

Figure 1: Signal strength from Western TV transmitters in the GDR



Source: Adapted from Die Welt, October 27, 1980.

3 According to Wolle (1998, p. 71), each night East Germans "collectively emigrated" to West Germany in front of their TV sets.

During the cold war, Western broadcast policies – especially television transmission to East Germany – intended to provide access to uncensored information in order to generate pro-Western attitudes and to undermine public support for communism. In addition, by watching West German TV, the treatment group could compare their own living standards to the higher standards of living of both their Western counterparts and of the fictive world of television series (such as *Dallas*) and movies. In an effort to maximize the availability of West German TV in East Germany, several West German television broadcasting towers were erected along the East German border. As a result of topographical features and the distance from West German transmitters, some regions of East Germany were still unable to receive West German TV, however. Figure 1 shows the signal coverage of West German TV in the GDR, and illustrates that distance from the broadcasting towers located near the inner German border and West Berlin determined signal strength. Note, specifically, that the Dresden region in the southern part of the GDR was a dead spot for Western TV.[4] In the north-east there was a second area without access to the West German TV signal; unfortunately this region did not overlap with the administrative borders of the GDR, and we do not observe individuals from this region.

3.2 Assumptions for identification

Comparability of groups before and during treatment

In order to infer the causality of watching West German television on aspirations, we ideally need two very similar groups that varied only in their access to West German TV. That is, our identification strategy relies on the assumption that differences in levels of aspiration between individuals living in Dresden (control group) and areas with Western TV access (treatment group) were not determined by (unobserved) factors beyond the mere effect of the consumption of Western TV.

In order to ensure the comparability *before* treatment we apply several strategies. Firstly, we account for possible regional heterogeneity. Since parts of the GDR had been influenced by Prussian traditions for several hundred years we control for a potential Prussia-effect deeply rooted in history. We also assign regions to the northern or southern part of the GDR since the traditionally higher concentration of industry in the south. Secondly, we make use of an early survey to demonstrate that living in the Dresden region did not affect aspirations differently before watching Western TV became common. As is shown in section 4.2, both strategies justify our identification assumption.

Similar concerns arise with respect to the comparability *during* treatment. We take care of several possible imbalances between the treatment and control group by using a rich set of control variables. However, by comparing observable characteristics of the treatment and control group – naturally, with exception of Western TV consumption and aspirations – no fundamental differences are indicated (table A1), suggesting similarities even in unobservable factors. Accordingly, Kern and Hainmüller (2009)

4 In the GDR the Dresden region was well known as the "valley of the innocent or clueless" (Etzkorn and Stiehler 1998).

credibly demonstrated that economic, political, and social conditions in the Dresden region were very similar to those in other regions of East Germany. That is in line with the political doctrine of the GDR targeted on equalizing regional differences in all respects. In that respect we also explicitly control for a possible 'Berlin effect' since Berlin as the capital of the GDR was characterized by a higher concentration of loyal functionaries as well as a slightly better provision of daily consumer goods. In section 4.2 it is shown that the 'Berlin effect' does not affect our results.

No spatial sorting

Another objection to the validity of the estimations is that East Germans in favor of watching West German TV could have migrated away from the Dresden region. However, residential mobility was extremely low in the GDR (Mohs 1980). In 1988, only 0.9 percent of the population moved across region borders; the out-migration rate in the Dresden region (0.7 percent) was slightly below average (see Statistical Yearbook of the GDR, 1989). Owing to central planning of the labor market and housing, there was hardly any labor mobility across regional borders. In addition, the huge shortage of housing eliminated spatial sorting. Hence, it seems to be highly unlikely that spatial sorting harms our identification strategy.

3.3 Data and measurement

We make use of survey data collected by the Central Institute for Youth Research ("Zentralinstitut für Jugendforschung"). The central institute produced many critical studies that were never allowed to be published. In order to ensure respondents' anonymity, questionnaires were conducted in group settings, were unmarked, and were collected in sealed urns.[5] As the main data source, we use a written survey whose participants had been selected via cluster-sampling. According to Etzkorn and Stiehler (1998) the sample is representative for the GDR. Even if it would be not representative our analysis is not affected because of the comparability of the treatment and control group (see table A1). The survey was conducted between the end of 1988 and the beginning of 1989.[6] At that time the GDR was a stable communist country and no one anticipated its termination.

We consider the survey very appropriate for our purposes. Firstly, the data set comprises mainly young adults with a mean age of 23 years and covers exactly the age cohort that grew up with Western TV. Accompanying the change in political leadership from Ulbricht to Honecker, the prohibition placed on watching of Western TV was eased in the early 1970s. Thus, in 1989 East German inhabitants had been watching West German programs for at least 15 years. Secondly, up to the beginning of 1989 the distinction between treatment and control group is clear-cut; after the fall of the Berlin wall this assignment becomes problematically because of the fast-growing exposure to

5 The data set is credible even in the case of the politically sensitive questions analyzed by Kern and Hainmueller (2009).

6 Zentralinstitut für Jugendforschung, Leipzig (n.d.): Political Climate and Social Conditions in the GDR 1988/89. GESIS Data Archive, Cologne. ZA6008 Data file Version 1.0.0, doi:10.4232/1.6008.

West German TV in all areas of the GDR and due to the huge out-migration flows probably causing a significant selection bias. Thirdly, the survey provides us with individual-level information on the actual frequency of watching West German TV, different measures of aspirations, residence regions of respondents, and a rich set of socio-demographic characteristics.

The survey contains 3564 observations.[7] The respondents belong to eight of the fifteen GDR regions (including East-Berlin), where one survey area, the Dresden region, was not exposed to West German TV.[8] At the end of 1988 about 1.8 million people of the 16 million East Germans lived in the Dresden region; 8.5 million people resided in the other seven survey regions. In the survey, about 20 per cent of the respondents can be assigned to the Dresden region constituting our control group. In all other seven regions exposure to West German TV was highly likely.[9] Individuals living in these seven regions form our treatment group.

Different dimensions of aspirations have been analyzed in the empirical literature. One branch of research is related to *consumption* aspirations. In that respect, Easterlin (2001b) focused on the consumer goods that people consider necessary for a good life. Another frequently explored dimension refers to *income* aspirations. For example, Stutzer (2004), and Knight and Gunatilaka (2012) used the income level which people consider sufficient or the bare minimum. Several questions are included in the survey which we use as proxies for these different dimensions of aspirations. With regard to the consumption dimension, we rely on the following question: "To what extent do you attach importance to acquiring valuable personal possessions (real estate, expensive cars, etc.)?" The income dimension is approximated by the question "To what extent do you attach importance to making use of all opportunities offered to earn money?" Besides these two questions addressing material aspirations we apply a proxy for a more *hedonistic* dimension of aspirations. People were asked "To what extent do you attach importance to living a comfortable and pleasant life without much effort?"

Individual consumption of Western TV is measured by answers to the question: "How often do you watch Western TV?" The possible responses were: "daily, several times a week, once a week, less often, never." In addition, we account for age, gender, (net) income, schooling, partnership, children, religion, and father's qualification. Thus, we estimate the following model of the impact of Western TV on aspirations:

$$\begin{aligned} \text{ASPIRATIONS}_i = f\,(&\text{WEST GERMAN TV CONSUMPTION}_i;\ \text{AGE}_i;\ \text{GENDER}_i;\\ &\text{INCOME}_i;\ \text{SCHOOLING}_i;\ \text{PARTNERSHIP}_i;\ \text{CHILDREN}_i;\\ &\text{RELIGION}_i;\ \text{FATHER'S QUALIFICATION}_i) \end{aligned}$$

7 Owing to missing values, particularly with regard to the income variable, sample size reduces to approximately 2600 in the regressions. Performing regressions with the full sample but without the income variable does not change our results.

8 The regions are Berlin (East), Cottbus, Dresden, Erfurt, Karl-Marx-Stadt, Leipzig, Magdeburg, Schwerin.

9 Note that no respondent resided in a region of the North East of the GDR without Western TV reception.

Since aspirations are ordinally measured and Western TV consumption is an ordinally coded endogenous regressor we apply IV techniques and estimate a bivariate two equation ordered probit model via full information maximum likelihood (Sajaia 2009). The endogenous variable is instrumented by a dummy variable indicating whether the respondent lived in the Dresden region or not.

In order to support our results, two additional surveys from the Central Institute for Youth Research are used. We test the validity of our main results by replicating the estimations with a different sample collected in 1984.[10] The second survey was conducted in 1973 when West German TV consumption was not permitted by the GDR regime.[11] By comparing the results for 1988 with those of 1973 we are able to check our identifying assumption that aspirations did not systematically differ between regions beyond unobserved variables. The summary statistics of all three surveys are provided in tables A2-A4 in the Appendix.

4. Results

4.1 Basic specification

Table 1 presents the results from the regression estimations. The dependent variables are *consumption aspirations* in column (1), *income aspirations* in column (2), and *hedonistic aspirations* in column (3). We use the Dresden region dummy as instrument for West German TV consumption. In all three regressions, the age variable has a highly negative impact on aspirations. Being female has a negative impact on consumption and income aspirations, but not on the hedonistic type. Schooling reduces the level of income and hedonistic aspirations. With regard to income, a significant u-shaped effect is confirmed only for income and consumption aspirations. With respect to our variable of interest we find that watching West German TV has a positive and highly significant effect on all three dimensions of aspirations. In what follows we argue that the correlations between Western TV consumption and aspirations have a *causal* interpretation.

10 Zentralinstitut für Jugendforschung, Leipzig (n.d.): Young People and Culture 1984. GESIS Data Archive, Cologne. ZA6058 Data file Version 1.0.0, doi:10.4232/1.6058.

11 Zentralinstitut für Jugendforschung, Leipzig (n.d.): Young People and Health 1973. GESIS Data Archive, Cologne. ZA6068 Data file Version 1.0.0, doi:10.4232/1.6068.

From a theoretical perspective, the strategy of identifying the effect of Western TV by means of a "natural experiment" using the Dresden dummy as instrument seems to be justified (see subsection 3.1 and 3.2). In order to further check the reliability of the analysis we perform standard specification tests with respect to endogeneity of the TV regressor as well as to the relevance and the validity of our instrument. Since some of the tests are not feasible in the case of an ordered probit model we re-estimate the model via two stage least square (2SLS), thereby assuming that aspirations and the frequency of watching Western TV can be considered metric variables. Regression results in this specification remain almost unchanged.[12] The corresponding tests are displayed in the lower part of table 1.

The LR Test rejects the hypothesis of independence between the error terms in the instrumental equation and the structural equation, indicating a clear violation of the exogeneity assumption of Western TV consumption. This result is supported by the Wu-Hausman test based on the 2SLS specification with the exception of column (3). Hence, we conclude that a one equation model assuming the exogeneity of regressors is inappropriate for identifying the causal effect of Western TV consumption: a proper instrument is required.[13] Thus we have to prove the relevance and validity of the Dresden region dummy. Of course, the relevance of our instrument is far from any doubt. The Dresden region dummy is highly significant in the instrument equation as is the F-test of weak instruments in the corresponding 2SLS. The validity of the instrument is supported by our specification check as the insignificant test of overidentifying restrictions (Sargan test) implies.[14] Altogether it can be inferred that there is – at the very least – no indication of an inaccuracy in our identification strategy. The technical perspective of econometric tests supports our theoretical arguments in favor of our instrument. That is to say, a correlation between Western TV consumption and aspirations can be interpreted as a causal effect.

12 Results for the 2SLS regressions of our model are available from the authors upon request.

13 It should be noted that the Wu-Hausman endogeneity test is only reliable if instruments are appropriate. Yet as will be immediately clear, we have no indication of an inaccurate instrument.

14 When performing the Sargan test the region of Leipzig is included in the 2SLS estimation as an additional instrument dummy. In the Leipzig region, located west of Dresden, some areas could not receive Western TV either (see figure 1).

Table 1: Bivariate two-equation ordered probit estimations and 2SLS specification tests

Dependent variable	(1) Consumption aspirations	(2) Income aspirations	(3) Hedonistic aspirations
West German TV consumption	0.097	0.079	0.091
	(4.95)***	(4.00)***	(4.65)***
Age	-0.032	-0.029	-0.035
	(6.88)***	(6.15)***	(7.48)***
Female	-0.382	-0.383	-0.054
	(8.29)***	(8.19)***	(1.18)
Schooling *(Ref. group = Low)*			
Medium	-0.037	-0.553	-0.635
	(0.49)	(6.95)***	(8.42)***
High	-0.125	-0.846	-0.846
	(1.34)	(8.70)***	(8.95)***
Income	-0.001	-0.001	-0.001
	(2.38)**	(2.24)**	(0.96)
Income squared	0.000	0.000*	0.000
	(2.09)**	(1.73)	(0.25)
Religious	0.046	-0.185	-0.008
	(0.75)	(2.97)***	(0.14)
Partnership *(Ref. group = Single)*			
Partner living apart	0.131	0.062	-0.035
	(2.26)**	(1.05)	(0.61)
Partner in Household	0.186	0.048	-0.035
	(2.83)***	(0.72)	(0.53)
Having Children	0.023	0.093	0.028
	(0.37)	(1.48)	(0.45)
Father's qualification *(Ref. group = Unskilled)*			
Skilled	0.138	-0.233	0.093
	(0.95)	(1.56)	(0.64)
Foreman/Technician	0.045	-0.301*	-0.034
	(0.30)	(1.93)	(0.22)
Academic	-0.051	-0.463	-0.099
	(0.34)	(3.01)***	(0.66)
Dresden instrument in instruments equation	-2.627	-2.625	-2.619
	(36.93)***	(36.90)***	(36.88)***
LR-Test H_0 Instruments and structural equation are independent (p-value)	66.32	40.71	17.42
	(0.000)	(0.000)	(0.000)
Observations	2611	2610	2607
Specification tests of the related linear model (2SLS)			
Endogeneity (Wu-Hausman)[a]	7.501	5.150	0.046
H_0 West-TV exogenous (p-value)	(0.006)	(0.023)	(0.831)
Weak instruments (F-test)[a]	4660.8	4658.0	4630.7
H_0 Instruments are weak (p-value)	(0.000)	(0.000)	(0.000)
Valid instruments (Sargan)[b]	0.041	0.001	0.026
H_0 Instruments are valid (p-value)	(0.840)	(0.971)	(0.872)

Notes: Significance levels: * $p<0.10$; ** $p<0.05$; *** $p<0.01$. If not separately noted t-values are in brackets. Cut-off points and dummies for missing value categories are not reported. a) The test refers to the 2SLS estimation of the model. b) When performing the over-identification test an additional instrumental dummy for the region of Leipzig is included in the 2SLS estimation.

4.2 Validity tests

As mentioned in subsection 3.2, one major concern about the reliability of our results is that the Dresden control group might have differed in aspiration related aspects from the treatment group living in other regions in ways beyond the mere TV effect. Even if the specification test cast no doubt on the validity of the instrument, we try to further support this assumption using alternative approaches. We construct area dummies to account for possible regional differences. In column (1) of table 2 we control for a potential Prussia-effect. In column (2) regions are assigned to the northern or southern part of the GDR. Finally, in column (3) we explicitly control for Berlin. In all three regressions we refer to the dependent variable of consumption aspirations. From table 2 we can infer that all the results from column 1 in table 1 remain unchanged in these alternative specifications. The effect of Western TV on consumption aspirations is slightly less when controlling for Prussia (0.090) or North (0.084) and somewhat greater when considering the Berlin dummy (0.109). In all regressions, the Western TV effect remains highly significant. When using the other types of aspirations as dependent variables, results do not change either.[15]

Additionally, we make use of an earlier survey from 1973 to study whether living in the Dresden region affected aspirations differently *before* watching Western TV became common. In 1973 consumption of Western TV was generally low for several reasons. In 1970 less than 70 percent of households had a TV set, compared to over 96 percent in 1989. More importantly, in the 1960s the GDR government prohibited Western TV and accompanied this by major campaigns such as “Lightning against NATO's transmitters” (*Blitz contra NATO-Sender*) or “Mission Ox-head” (*Aktion Ochsenkopf*), where aerials pointing at the West were removed. In contrast, in the 1970s the relations between the GDR and FRG were characterized by a policy of détente and Western TV became unofficially tolerated. Therefore we expect that in the 1973 survey, living in Dresden affects aspirations less than in 1988. Column 1 in table 3 depicts the results for the reduced form estimation where income aspirations are regressed on the Dresden region dummy and other control variables. In the 1973 data we find no evidence that living in the Dresden region affected income aspirations. For comparison purposes columns (2) and (3) depict the reduced form estimates for the 1988 survey. While column (2) displays all observations, for the regression in column (3) we restrict the sample analogously to the 1973 survey.[16] Contrary to the 1973 sample, in both these regressions living in the Dresden region is, in accordance with our main results, negatively correlated to income aspirations. Thus, we conclude that the applied identification strategy does indeed capture the Western TV effect.

15 The regressions are available from the authors upon request.

16 As can be seen from table 3, results for the restricted, and the full 1988 sample are very similar.

Table 2: Validity test I (Bivariate two-equation ordered probit)

Dependent variable: Consumption aspirations	(1) Prussia	(2) North	(3) Berlin
West German TV consumption	0.090 (4.33)***	0.084 (4.00)***	0.109 (5.43)***
Age	-0.032 (6.89)***	-0.031 (6.86)***	-0.031 (6.81)***
Female	-0.383 (8.31)***	-0.381 (8.27)***	-0.374 (8.11)***
Schooling *(Ref. group = Low)*			
Medium	-0.029 (0.38)	-0.019 (0.25)	-0.051 (0.68)
High	-0.120 (1.29)	-0.114 (1.22)	-0.128 (1.37)
Income	-0.001 (2.33)**	-0.001 (2.28)**	-0.001 (2.42)**
Income squared	0.000 (2.03)**	0.000 (2.00)**	0.000 (2.18)**
Religious	0.051 (0.83)	0.056 (0.91)	0.037 (0.60)
Partnership *(Ref. group = Single)*			
Partner living apart	0.132 (2.28)**	0.134 (2.32)**	0.138 (2.39)**
Partner in Household	0.187 (2.85)***	0.191 (2.91)***	0.198 (2.99)***
Having children	0.026 (0.42)	0.027 (0.44)	0.020 (0.32)
Father's qualification *(Ref. group = Unskilled)*			
Skilled	0.147 (1.01)	0.153 (1.05)	0.104 (0.71)
Foreman/Technician	0.053 (0.35)	0.059 (0.39)	0.015 (0.10)
Academic	-0.047 (0.32)	-0.045 (0.30)	-0.069 (0.46)
Prussia	0.059 (1.19)		
North		0.090 (1.86)*	
Berlin			-0.211 (3.05)***
Observations	2611	2611	2611

Notes: Significance levels: * $p<0.10$; ** $p<0.05$; *** $p<0.01$; t-values are in brackets. Cut-off points and dummies for missing value categories are not reported.

Finally we apply a robustness check to verify the validity of our results with another survey conducted in 1984 (column 4 in table 3). Aspirations are measured by answers to a question on the "importance of a high standard of living" which we subsequently refer to as consumption aspirations. The data set also allows accounting for age, gender, education, children and marital status. As in our main regressions, we estimate a simultaneous two equation IV ordered probit model, where once again Dresden serves as an instrument for Western TV consumption. We find that watching West German TV has a positive and highly significant impact on consumption aspirations.

Table 3: Validity test II (1973-Survey vs. 1988-Survey; 1984-Survey)

	(1) Survey 1973	(2) Survey 1988 (Restricted Sample)[a]	*(3) Survey 1988 (Sample table 1)*	(4) Survey 1984
Dependent variable	Income aspirations	Income aspirations	*Income aspirations*	Consumption aspirations
West German TV consumption				0.168 (2.68)***
Dresden region	-0.067 (0.73)	-0.205 (2.86)***	*-0.207 (4.07)****	
Age	Group dummies included	-0.004 (0.55)	*-0.027 (6.60)****	-0.017 (0.97)
Female	-0.279 (3.06)***	-0.290 (4.04)***	*-0.328 (7.74)****	-0.083 (1.07)
Schooling *(Ref. group = Low)*				
Medium	-0.150 (1.58)	-0.390 (2.82)***	*-0.611 (7.80)****	-0.195 (0.89)
High	-0.568 (3.05)***	-1.032 (3.81)***	*-0.989 (10.52)****	-0.748 (3.20)***
Married	0.022 (0.21)	-0.088 (1.03)	*-0.069 (1.33)*	0.047 (0.31)
Having Children				0.041 (0.26)
Dresden instrument in instruments equation				-1.598 (14.33)***
Observations	684	906	*2609*	842

Notes: Significance levels: * $p<0.10$; ** $p<0.05$; *** $p<0.01$; t-values are in brackets. Cut-off points and dummies for missing value are not reported. a) For comparability to the 1973 survey (column 1) the sample of 1988 was restricted to young workers living in the regions of Erfurt, Leipzig and Dresden (column 2).

In a nutshell, we find robust evidence of a positive correlation between watching West German TV and aspirations. We provide evidence that these results are not driven by endogeneity. Our empirical design based on a natural experiment implies a causal relationship running from TV to aspirations. This conclusion resists various sets of alternative specifications and samples.

5. Conclusion

When isolating the impact on behavior or attitudes of watching TV, endogeneity and reversed causality are potentially problematic. We exploited a natural experiment that took place in Germany after WWII. For topographical reasons, Western TV programs could not be received in certain parts of East Germany which were referred to as the "valley of the innocent". This scenario allowed for the identification of two very similar groups which differed only in their access to Western TV. We found that treatment with Western TV programs had a positive impact on income aspirations, consumption aspirations as well as on hedonistic aspirations. We supported our results by applying a set of alternative specifications. First, when including area dummies to capture possible regional differences, results remained unchanged. An earlier survey allowed for the testing of the hypothesis that living in a "dead Western TV spot" did not affect aspirations differently before watching Western TV became common. And, as a final robustness check we verified the validity of our results with a third survey.

Our results suggest that comparisons are made not only with friends and neighbors, but also with images, lifestyles or characters seen on TV. Furthermore, we provide additional evidence that TV consumption plays a decisive role in forming aspirations, and therefore may go some way to explaining the income-happiness paradox (Easterlin 1974). In that respect our study helps to explain the empirical pattern in life satisfaction of East and West Germans after the unification of Germany in 1990 (Easterlin and Plagnol 2008). After the dismantling of the wall, East Germans suddenly compared themselves – not only virtually, but in reality – to their much wealthier Western counterparts, resulting in much lower levels of happiness among East Germans. As a result of increasing income levels during the 1990s, the gap between material aspirations, and income was reduced, and life satisfaction converged to the Western level.

We contribute to the few existing economic studies that make use of exogenous variation in TV access. In analyzing the introduction of cable TV in rural India, Jensen and Oster (2009) showed that this was associated with women's status. Similarly, Chong and La Ferrara (2009) exploited the different timing of entry of the main *telenovela* producer in Brazil and explored the effect of television expansion on divorce. However, in contrast to our analysis, these studies could not rule out the possibility that some unobservable variables may drive TV access as well as attitudes and behavior, thus preventing the authors from making a causal inference.

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Appendix

Table A1: Observables: treatment vs. control group of the 1988 Survey

Variable	Description/Item	Sample size	Share / Mean	Sample size	Share / Mean
		Treatment group		Control group	
West German TV consumption: Frequency of watching Western TV	*Never*	2746	1.7	734	67.9
	Rarely		3.7		14.7
	Once a week		1.7		2.3
	Several times a week		26.7		9.4
	Daily		66.3		5.7
Consumption aspirations: Importance of acquiring possessions	*Not at all*	2760	8.7	778	10.9
	Low		15.9		21.6
	Medium		29.0		32.8
	Much		27.4		23.4
	Very much		19.1		11.3
Income aspirations: Importance of making money	*Not at all*	2761	2.1	778	2.3
	Low		11.7		14.0
	Medium		28.2		37.4
	Much		29.8		30.0
	Very much		28.2		16.3
Hedonistic aspirations: Importance of pleasant life	*Not at all*	2756	13.6	779	19.1
	Low		24.1		30.0
	Medium		27.9		28.2
	Much		21.7		16.1
	Very much		12.6		6.6
Age	Age in years (mean)	2727	23.0	770	23.4
Income	Monthly net income in Mark of GDR(mean)	2148	746.2	594	763.3
Partnership	*No partner*	2779	38.7	784	35.0
	Living apart		25.2		23.0
	In household		17.4		23.0
	Other		18.7		19.1
Having children	Respondent has children	2734	31.2	773	38.3
Religious: Believing in God	*Yes*	2779	14.1	784	14.9
	No		84.5		84.1
	Other		1.4		1
Schooling: level of school education	*Low*	2753	9.5	778	8.5
	Medium		80.3		80.7
	High		10.2		10.8
Father's education	*No*	2779	1.8	784	1.2
	Low		50.0		44.1
	Medium		16.1		15.9
	High		23.6		29.2
	Other		8.5		9.6
Female	Respondent is female	2749	46.6	777	51.2

Data source: Zentralinstitut für Jugendforschung, Leipzig (n.d.): Political Climate and Social Conditions in the GDR 1988/89. GESIS Data Archive, Cologne. ZA6008 Data file Version 1.0.0, doi:10.4232/1.6008.

Table A2: Sample descriptions of the 1988 Survey

Variable	Description/Item	Sample size	Share / Mean	Share / Mean	Share / Mean	Share / Mean
		Entire Sample		Regression (1)	Regression (2)	Regression (3)
West German TV consumption: Frequency of watching Western TV	*Never*	3480	15.6%	16.4%	16.4%	16.4%
	Rarely		6.0%	5.8%	5.8%	5.8%
	Once a week		1.8%	1.5%	1.5%	1.5%
	Several times a week		23.0%	23.2%	23.2%	23.2%
	Daily		53.5%	53.1%	53.1%	53.1%
Consumption aspirations: Importance of acquiring possessions	*Not at all*	3545	9.3%	10.2%		
	Low		17.1%	18.2%		
	Medium		29.7%	30.7%		
	Much		26.5%	25.9%		
	Very much		17.4%	15.1%		
Income aspirations: Importance of making money	*Not at all*	3546	9.3%		2.1%	
	Low		17.1%		12.9%	
	Medium		29.7%		31.2%	
	Much		26.5%		29.6%	
	Very much		17.4%		24.3%	
Hedonistic aspirations: Importance of pleasant life	*Not at all*	3542	9.3%			16.0%
	Low		17.1%			26.7%
	Medium		29.7%			28.3%
	Much		26.5%			19.1%
	Very much		17.4%			9.9%
Dresden	Respondent lives in the Dresden region	3563	22.0%	21.0%	21.0%	21.1%
Age	Age in years (mean)	3497	23.1	24.8	24.8	24.8
Income	Monthly net income in Mark of GDR(mean)	2742	749.93	747.7	747.6	747.8
Partnership	*No partner*	3570	37.8%	31.2%	31.2%	31.2%
	Living apart		24.7%	22.6%	22.5%	22.5%
	In household		18.6%	23.6%	23.6%	23.6%
	Other		19.0%	22.7%	22.7%	22.7%
Having children	Respondent has children	3507	32.8%	41.2%	41.3%	41.3%
Religious: Believing in God	*Yes*	3570	14.2%	13.4%	13.4%	13.4%
	No		84.3%	86.1%	86.1%	86.0%
	Other		1.5%	0.5%	0.5%	0.5%
Schooling: level of school education	*Low*	3531	9.3%	9.1%	9.1%	9.1%
	Medium		80.4%	77.7%	77.7%	77.6%
	High		10.4%	13.2%	13.2%	13.3%
Father's education	*No*	3570	1.7%	2.1%	2.1%	2.1%
	Low		48.6%	51.2%	51.2%	51.2%
	Medium		16.0%	16.3%	16.3%	16.3%
	High		24.8%	23.3%	23.3%	23.3%
	Other		8.9%	7.2%	7.2%	7.1%
Female	Respondent is female	3526	47.7%	49.3%	49.3%	49.3%
Regression sample				2611	2610	2607

Data source: Zentralinstitut für Jugendforschung, Leipzig (n.d.): Political Climate and Social Conditions in the GDR 1988/89. GESIS Data Archive, Cologne. ZA6008 Data file Version 1.0.0, doi:10.4232/1.6008.

Table A3: Sample description of the 1973 Survey

Variable	Description/Item	Sample size	Share	Share
		Entire Sample		Regression sample
Income aspirations: Importance of making money	*Not at all*	2588	0.9%	0.7%
	Low		3.1%	2.1%
	Medium		17.9%	11.7%
	Much		41.4%	41.4%
	Very much		36.8%	44.1%
Dresden	Respondent lives in the Dresden region	761	40.1%	40.2%
Age groups	*14-15 years*	2608	23.3%	21.5%
	16-17 years		36.8%	39.8%
	18-19 years		20.0%	7.0%
	20-21 years		9.6%	8.2%
	22-23 years		5.1%	8.2%
	24-25 years		3.0%	8.3%
	26 years and above		2.3%	7.0%
Schooling: level of school education	*Low*	2583	34.2%	44.7%
	Medium		45.7%	49.4%
	High		20.1%	5.9%
Female	Respondent is female	2623	50.9%	43.6%
Married	Respondent is married	2614	17.8%	49.0%
Regression sample				684

Data source: Zentralinstitut für Jugendforschung, Leipzig (n.d.): Young People and Health 1973. GESIS Data Archive, Cologne. ZA6068 Data file Version 1.0.0, doi:10.4232/1.6068.

Table A4: Sample description of the 1984 Survey

Variable	Description/Item	Sample Size	Share / Mean	Share / Mean
		Entire Sample		Regression sample
West German TV consumption: Frequency of watching Western TV	*Never*	880	20.9%	20.7%
	Rarely		14.9%	15.2%
	Once a week		7.5%	7.7%
	Several times a week		27.3%	27.4%
	Daily		29.4%	29.0%
Consumptions aspirations: Importance of high standard of living	*Not at all*	1799	0.7%	0.5%
	Low		5.6%	4.6%
	Medium		22.3%	22.0%
	Much		41.8%	41.6%
	Very much		29.6%	31.4%
Dresden	Respondent lives in the Dresden region	1828	18.2%	18.1%
Age	Age in years	1802	20.0	19.6
Married	Respondent is married	1815	16.2%	15.3%
Having children	Respondent has children	1798	18,1%	16.7%
Schooling: level of school education	*Low*	1791	4.0%	3.3%
	Medium		73.4%	73.5%
	High		22.6%	23.2%
Female	Respondent is female	1814	47.3%	48.9
Regression sample				842

Data source: Zentralinstitut für Jugendforschung, Leipzig (n.d.): Young People and Culture 1984. GESIS Data Archive, Cologne. ZA6058 Data file Version 1.0.0, doi:10.4232/1.6058.