



Highbrow heritage: the effects of childhood cultural capital on wealth

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Abstract

Does exposure to cultural capital in childhood—in other words, having access to and familiarity with norms of highbrow culture—affect wealth accumulation later in life? We use data from the Household Finance and Consumption Survey (HFCS) to examine the relationship between various forms of cultural capital and wealth holdings in Austria. According to structural equation models, three indicators of cultural family background—the father’s educational attainment, the number of books in the parental household, and regular attendance of cultural activities at the age of ten—are positively correlated with net wealth. While education and income are key channels through which cultural capital affects wealth, we also observe direct effects in several specifications. The results are more marked within the over-50 cohort, suggesting that cultural capital’s role in wealth accumulation might have attenuated over decades of social change and educational expansion.

Keywords Wealth · Inequality · Cultural capital · Social mobility

JEL D31 · J62 · Z13

1 Introduction

The question of how far socio-economic outcomes result from individual effort, innate abilities, or family background is crucial for social policy and perceptions of fairness. Research on intergenerational mobility has thus become prominent in inequality literature, but primarily focuses on the transmission of educational attainment, income, and occupation (Black and Devereux, 2011; Torche, 2015).

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However, with the exception of a few articles (Adermon et al., 2018; Black et al., 2020), there is only little empirical evidence for the case of wealth, which is another important indicator of economic capability and material well-being. Does family background, comprising a myriad of economic, social, and cultural endowments, affect the possibilities to accumulate wealth later in life?

The rich literature that exists on intergenerational income mobility does not render research on wealth redundant. Private household wealth is considered a major determinant for living standards with distinct functions, such as establishing security, providing use value, generating income, and, eventually, exerting power. In addition, wealth increases the purchasing power beyond current income and loosens credit constraints by serving as collateral. Income and wealth are thus two different worlds of material well-being, and the correlation between the two is only moderate (Keister and Lee 2017). It is well documented that the distribution of wealth is generally much more unequal than the distribution of income (Nekoei and Seim 2022; Ertl et al. 2022), and that wealth inequalities persist over generations (Adermon et al. 2018; Clark and Cummins, 2015; Hansen, 2014). This implies that family background matters not only for income, education, and occupation, but also for wealth.

The work of French sociologist Pierre Bourdieu (1930–2002) on capital theory is a powerful framework to better understand why family background is an important determinant of descendants' economic performance. In his workhorse theory, Bourdieu distinguishes between economic, social, and cultural forms of capital that shape opportunities in life. In this paper, we focus on the role of cultural capital and its three manifestations: the embodied state, the institutionalized state, and the objectified state. Embodied cultural capital is a combination of abilities and traits that are passively learned within the family or intentionally acquired, such as soft skills, linguistic competencies or manners. Institutionalized cultural capital refers to the formal recognition of cultural competence granted by an institution, predominantly through educational credentials. Objectified cultural capital is the value inherent in cultural objects that individuals may possess, like books or paintings. Contrary to the many empirical studies that restrict analysis to just one of these manifestations of cultural capital (Kraaykamp and van Eijck, 2010), we include indicators for all three to study the role of family background for adult wealth.

It is challenging to empirically analyze the association between parental cultural capital and the net wealth of descendants. First, many aspects of family background are hard to measure and often limited by data availability. Second, reliable information on private wealth is scarce and has impeded research in many countries. The Household Finance and Consumption Survey (HFCS) provides a unique opportunity to address both issues. It is the most comprehensive survey on private household wealth in eurozone countries and, in the 2014 survey wave, includes questions about parental cultural capital in the non-core section of the questionnaire for Austria. We use three indicators of cultural capital (CC): the educational attainment of the father (as a proxy for institutionalized CC), the number of books in the parental household (as a proxy for objectified CC), and the regular attendance of cultural activities by an individual's family (as a proxy for embodied CC). We apply structural equation modeling to measure the association between cultural capital and net wealth, and to decompose the total effect into direct and indirect effects. By doing so, we are able to study the indirect links that unfold via education and income which are key for

wealth accumulation. The direct effect in the model captures the direct and unobservable mechanisms between cultural capital endowment and net wealth, such as risk aversion, savings preferences, and other personal traits.

We find significant total effects for all indicators of cultural capital on private wealth, and even stronger effects when individuals have obtained multiple cultural capital endowments at once. While it is mainly the indirect effect of cultural capital—working via descendants' income and educational attainment—that drives the results, we observe a direct effect for some indicators of cultural capital, such as childhood attendance of cultural activities. There are distinct cohort effects that signal a more pronounced impact for individuals aged over 50 compared to younger respondents. The role cultural capital plays in wealth accumulation might thus have changed over the decades, particularly given the substantial educational expansion that has taken place in Austria since the 1970s. As part of a major reform of the education system, entrance examinations to upper-level schools were removed in 1971 and fees in the higher education sector were abolished in 1972. With the removal of these entry barriers, enrollment in higher education increased considerably and family background supposedly became less decisive for educational and professional careers and thus wealth accumulation.

Our paper adds new insights to the vast literature on intergenerational social mobility. There is ample evidence that socioeconomic differences in childhood matter for outcomes in adulthood, for instance the provision of early childcare (Havnes and Mogstad, 2015; Felfe and Lalive, 2018), effects of early school tracking (Canaan, 2020; Pekkarinen et al. 2009) and growing up in different neighborhoods (Chetty and Hendren, 2018; Bingley et al. 2021). However, there are only a few studies that examine the role of cultural capital, and even fewer that use wealth as an outcome variable for social mobility. We show that childhood cultural capital is key to understanding differences in adult wealth, as it is associated with many components of wealth accumulation. Ignoring differences in childhood cultural capital and focusing solely on the role of educational attainment and income in wealth accumulation could lead to misguided conclusions for social policy.

2 Cultural capital and wealth accumulation

Pierre Bourdieu's capital theory provides a valuable framework to better understand the role of family background in social status acquisition. Families are equipped with various sorts of capital that have the potential for reproduction and intergenerational transmission. According to Bourdieu, capital takes specific (im)material forms and may be categorized as economic, social, or cultural (Bourdieu, 1986): economic capital is immediately convertible into money and can be institutionalized by property rights; social capital refers to networks and relationships and may be institutionalized in the form of a title of nobility; cultural capital is broadly defined as the accumulation of knowledge, behaviors, and skills that can be institutionalized, for instance, in educational attainment. This conglomerate of economic, social, and cultural capital constitutes the basis for social status reproduction and intergenerational persistence. While Bourdieu stresses that economic capital is the dominant type of capital, all three forms have idiosyncratic effects on the intergenerational

transmission of social status. In this paper, we focus primarily on the role of cultural capital in creating possibilities for wealth accumulation.

Bourdieu (1986) argues that cultural capital can exist in three forms: the embodied, objectified, and institutionalized state. The embodied state comprises lasting incorporated dispositions of the mind and body, which closely relates to the notion of the *habitus*. This involves a lifelong process of socialization that usually starts in early childhood and mostly takes place unconsciously (Kraaykamp and van Eijck, 2010). Embodied cultural capital cannot be transmitted instantaneously but is acquired and accumulated under specific conditions within society and with respect to social class. While lower-class individuals might be able to develop such competencies that are related to the upper-class, they may never achieve the natural familiarity of upper-class individuals (Lamont and Lareau, 1988). Cultural capital in the objectified state refers to the possession of goods with both material and symbolic value, such as artworks, books, and musical instruments. These goods can be transmitted materially as a change in legal ownership; however, in order to appropriate and appreciate them, access to embodied cultural capital is required. The institutionalized state is the formal recognition of cultural capital, such as educational attainment or academic credentials. This objectification of cultural capital marks the line between the autodidact and the holder of a legal certificate implying competence that might be convertible into economic capital. Bourdieu points out that hierarchically organized educational institutions ultimately have the power to define what knowledge is more or less important in order to achieve educational attainment (Georg, 2004).

The concept of cultural capital has been widely adopted in social sciences and is thus loaded with a plethora of analytical nuances. In sociological literature, an analytical distinction between “highbrow” and “lowbrow” culture has been relevant for most of the big debates about *culture* in the last 50 years (Halle, 2007). Moreover, this concept is closely intertwined with the concept of social status and class (Bukodi and Goldthorpe, 2013). Distinguishing highbrow from lowbrow culture helps to single out the idiosyncratic nature of highbrow culture as a status-marker for the upper classes. However, there is growing evidence of cultural omnivorousness of both highbrow and lowbrow culture that is generally interpreted as an ethos of cultural openness and tolerance (Friedman et al. 2015). Others argue that the decline of highbrow culture is accompanied by the emergence of a cosmopolitan cultural capital rather than the rise of the cultural omnivore (Prieur and Savage, 2013). Given the evolution of cultural distinction, the new dividing lines of social stratification might not be about highbrow and lowbrow tastes, but rather about different modes of consumption and appreciation (Jarness, 2015; O’Brien and Ianni, 2023). This literature shows increasing recognition that the nature of cultural capital has evolved since Bourdieu originally developed his theory in the 1960s and 1970s. The socio-economic circumstances that underlie the acquisition of cultural capital have undeniably changed, for instance due to technological change or advances in educational systems that facilitated the access to highbrow cultural capital.

The transmission of cultural capital within the family mostly escapes observation and attains full efficacy when validated by the educational system. Bourdieu argues that children are already equipped with different amounts of cultural capital and a *habitus* when they start their educational careers. While formal educational

attainment is not transmissible per se, and the education system appears to only reward individual commitment and natural qualities, differences in cultural capital endowment result in unequal starting conditions. In addition, the education system reflects the cultural orientation of the upper classes, allowing their children to distinctly fit into the schooling system with ease. As children from other social classes may also gradually acquire these cultural tastes, class differences in cultural capital should thus be most apparent in children at a very young age (Dumais, 2006). The bulk of empirical literature corroborates Bourdieu's argument and finds positive effects of cultural capital on the educational success of children (Lareau and Weininger, 2003; Tramonte and Willms, 2010; DiMaggio, 1982). Some studies, in contrast, do not find evidence that cultural capital predicts educational achievement (Katsillis and Rubinson, 1990) or, at least, has no lasting influence on the life course trajectory once secondary school has been completed (Georg, 2004).

Cultural capital might also affect other socio-economic outcomes besides education, such as physical health (Veenstra and Abel, 2019; Bygren et al. 1996), income (Brunello et al. 2017; Reeves and de Vries, 2019), soft skills like work ethic (Kundu et al. 2023), or wealth. In the case of wealth, however, there is insufficient evidence to indicate whether it is self-made or transmitted via economic, social, and cultural capital. A simple model for wealth denotes

$$W_t = f(S_y, r_w, T_w) \quad (1)$$

where wealth W at time t is a function of aggregate savings S out of permanent income y , the rate of return on wealth r_w , and received (intergenerational) transfers of wealth T_w . Cultural capital plays an important role for all of these wealth accumulation components. This model describes an *individual* wealth accumulation process. However, assortative mating might reinforce these patterns on a household level (DiMaggio and Mohr, 1985; Fagereng et al. 2022).

Savings is defined by the difference between income and consumption, which are both related to cultural capital. Income is tied to cultural capital via the well-established link to formal educational attainment and human capital formation (e.g., De Graaf et al. 2000; DiMaggio, 1982; Brunello et al. 2017). Moreover, cultural capital might directly affect income; for instance, knowledge of relevant cultural tastes and activities could facilitate job interviews (Rivera, 2012) and promotions (Reeves and de Vries, 2019). In addition, cultural capital may be positively linked to soft skills like leadership or work ethic that are associated with job performance and income (Kundu et al. 2023; Santos et al. 2018). We thus expect cultural capital to have positive direct and indirect effects on income (Brunello et al. 2017). Evidence for the nexus between cultural capital and consumption behavior is scarce. Holt (1998) shows qualitative differences in consumption patterns based on cultural capital endowment due to diverse tastes. Individuals with high cultural capital tend to consume a broader range of genres. The literature documents, for instance, varying food choices with respect to differences in cultural capital (Kamphuis et al. 2015; Kamphuis et al. 2018). Class-specific consumption preferences are also related to the notion of conspicuous consumption to represent social status (Trigg, 2001). However, this does not necessarily mean higher consumption expenses for high cultural capital individuals as they might derive rewards from an ascetic lifestyle (Oude Groeniger et al. 2020) rather than the accumulation of costly goods. Thus, the

direction of cultural capital's effect on consumption is unclear. Finally, there is empirical evidence that cultural family background exerts influence on saving preferences (Buccioli and Veronesi, 2014; Webley and Nyhus, 2006). The effect of parental financial socialization on the propensity to save includes giving advice on budgeting and discussing financial matters with children.

The rate of return to wealth might differ with respect to cultural capital, for instance, as a result of financial literacy. Garcia Aracil et al. (2016) show that a family's cultural assets, such as literature and artworks, are associated with children's better financial literacy. This knowledge might translate into better investment strategies, risk diversification, and thus higher and more stable returns to capital. There is evidence that financial literacy has effects beyond formal education that result in higher wealth accumulation (Behrman et al. 2012). We therefore hypothesize a positive link between cultural capital and the rate of return. Finally, the consideration of direct wealth transfers, i.e., inheritances and gifts, is crucial to disentangle the effects from intergenerational transmission of cultural and economic capital, as individuals with high cultural capital might also be more prone to get inheritances that are more valuable.

The empirical social sciences have strived to operationalize cultural capital in order to assess its role in social reproduction and intergenerational social mobility. This is complicated by the fact that in Bourdieu's framework, cultural capital has repeatedly changed its definition and has alternatively been an (in)formal academic standard, a class attribute, a criterion for social selection, and a power resource (Lamont and Lareau, 1988; Kingston, 2001, Prieur and Savage, 2013). The empirical literature thus applies a broad set of indicators for cultural capital, such as participation in cultural activities (DiMaggio and Mohr, 1985; Dumais, 2006; Noble and Davies, 2009), cultural knowledge (Sullivan, 2001; DiMaggio, 1982), fluency with modes of expression (Sullivan, 2001), cultural tastes (DiMaggio, 1982), educational qualification (Georg, 2004), and the capacity to perform tasks in culturally acceptable ways (Bygren et al. 1996). The relative importance of these various manifestations of cultural capital depends on the underlying research question. In the context of intergenerational mobility and social reproduction, there has been criticism that these variables only measure the cultural capital of descendants rather than family background. Recent studies have thus aimed to capture *parental* cultural capital, such as involvement in highbrow cultural activities, educational attainment, and parents' reading behavior (De Graaf et al. 2000; Sullivan, 2001; Noble and Davies, 2009), or the number of books in the parental household (Sieben and Lechner, 2019; Brunello et al. 2017; Evans et al. 2010; Noble and Davies, 2009). In this study, we use three variables for the different manifestations of cultural capital to contrast our findings and check for robustness (see Section 6).

3 Method

Parental cultural capital might have direct effects on adult's wealth and indirect effects that unfold via educational attainment and descendants' income. Figure 1 shows a path diagram for the theoretical relationships between family background and wealth, focusing on cultural capital. Taking the three forms of capital developed

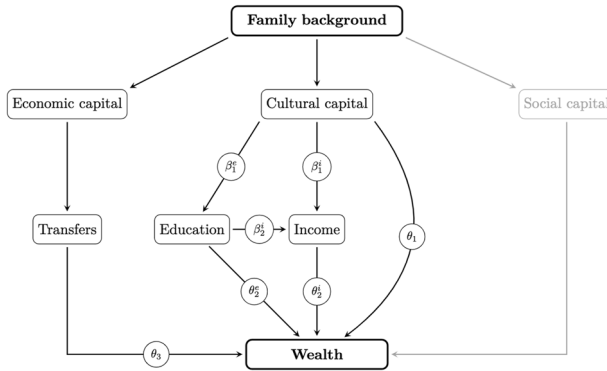


Fig. 1 Potential channels between family background and descendant wealth

by Bourdieu (1986) as a basis, we illustrate the potential intergenerational channels for wealth accumulation. Parental economic capital increases descendant wealth directly through intergenerational transfers such as inheritances and gifts (θ_3). Social capital and networks provided by parents may eventually also be converted into economic capital and thus increase the wealth of descendants (Chetty et al. 2022). However, our data source lacks information on this form of capital. Our analysis mainly focuses on cultural capital (CC), thereby distinguishing between the institutionalized, objectified, and embodied state of CC. θ_1 depicts the direct effect of cultural capital on wealth that is not captured by an individual’s educational attainment or income. For instance, cultural capital might be associated with higher rates of return on investments due to better financial literacy, different risk preferences, or more successful investment behavior (Fagereng et al. 2021). The assortative mating of couples with a similar cultural capital background might reinforce these effects (Charles et al. 2013; Fagereng et al. 2022). Parental cultural capital may also have an indirect effect on descendant wealth via formal education (θ_2^e) and income (θ_2^i). For instance, parents’ institutionalized CC might promote their children’s educational success, as they are more familiar with the schooling system and more aware of its benefits (Kraaykamp and van Eijck 2010). There is ample evidence that cultural capital affects an individual’s educational attainment (β_1^e) and income level (β_1^i) later in life, as shown in Section 2.

The supposition that family background exerts direct and indirect effects on descendants’ wealth entails important implications for the methodological approach. A standard regression model only measures the direct effect of an explanatory variable on a dependent variable and a priori assigns each variable as a cause or an effect (Gunzler et al. 2013). This approach is not well suited for our research design, as some variables in our framework are assumed to be causes as well as effects. Therefore, we adopt a multiple mediation analysis method (Baron and Kenny, 1986) to analyze the direct and indirect effects of cultural capital on wealth through the two channels of education and income. These intermediate variables, or so-called *mediator variables*, more closely explain the complex dependency structures of how an exposure variable influences an outcome. We use structural equation modeling (SEM), as it provides a suitable (inference) framework for mediation analysis and

allows us to consider the impact of all mediators jointly and simultaneously instead of analyzing them one at a time (Gunzler et al. 2013; Hayes, 2009; VanderWeele and Vansteelandt, 2014; Zhao et al. 2010). Nevertheless, there could be missing information on factors that are difficult to measure such as social capital or preferences, which are intertwined with cultural capital and may also impact wealth later in life beyond education and income. We acknowledge that technically, the direct effect may also capture the influence of cultural capital on wealth through these omitted variables.

We present four models to capture the effect of cultural capital on wealth later in life, using three different exposure variables for the different states of CC and an additional model using a latent variable approach: (1) education of the father (institutionalized CC), (2) number of books at age ten (objectified CC), (3) attendance of cultural activities at age ten (embodied CC), and (4) a latent variable incorporating all three of the previously mentioned indicators. The latent variable approach assumes a *true value of cultural capital* behind the latent variable. This value cannot be measured directly, but we observe various associated indicators that reflect cultural capital. This implies that the latent variable can deviate from the ‘true value’ due to some degree of measurement error (Mair, 2018). The latent variable here is constructed by including all three CC indicators and setting the first factor (institutionalized CC) to the value 1, thereby fixing the scale of the latent variable. In all models, education and income serve as mediator variables and net wealth as the dependent variable. While we do not have any information on social capital or personal networks, we can control for direct transfers of economic capital—in the form of inheritances and gifts—to disentangle the effects of cultural and economic capital. Furthermore, we include several other socio-economic variables, such as gender, age, migrant background, employment status, working hours, residual household income, the number of household members, and tenure status (for a detailed description of the variables, see Section 4). We do not have full information on all the potential channels, for instance, heterogeneous rates of return due to differences in financial literacy. These effects are therefore captured by the direct effect of cultural capital on wealth (θ_1 in Fig. 1 and Eq. 2).

In this paper, we apply a regression-based approach for standard structural equation models with multiple mediators and a continuous outcome variable as proposed by VanderWeele and Vansteelandt (2014). Equation (2) shows the specification for the outcome variable containing all mediator variables, where W is the outcome variable (net wealth, inverse hyperbolic sine (IHS) transformed), A denotes the exposure variable (cultural capital), M^e (years of schooling) and M^i (log. disposable income) are the two different mediator variables, T denotes inheritances and wealth transfers, and C represents the remaining covariates. Thus, Eq. (2) gives the outcome regression, if exposure A were set to some value a , mediators M to m , inheritances T to t and covariates C to c .

$$E[a, m, t, c] = \theta_0 + \theta_1 a + \theta_2^e m^e + \theta_2^i m^i + \theta_3 t + \theta_4 c \quad (2)$$

In addition, we jointly estimate separate regressions for each of the two mediator variables M^e and M^i , conditional on $C = c$ and $A = a$ (VanderWeele and Vansteelandt, 2014). The equation for the second mediator variable (log. disposable income) includes an additional term for educational attainment $\beta_2^i e$, as it plays an

important role in an individual’s income possibilities and serves as a cause as well as an effect in this setting.

$$E[a, c] = \beta_0^e + \beta_1^e a + \beta_2^e c \tag{3}$$

$$E[a, c, e] = \beta_0^i + \beta_1^i a + \beta_2^i e + \beta_3^i c \tag{4}$$

The natural direct effect (DE), denoted in Eq. (5), corresponds to the mean potential effect of the (exogenous) exposure variable A (CC) on the outcome variable W (net wealth), comparing $A = a$ with $A = a^*$, while controlling for the mediator variables M^e and M^i (VanderWeele and Vansteelandt, 2014; Huber, 2019). The exposure variables are regarded as conditionally independent of the mediator and outcome variables due to their sequential nature. The natural direct effect assumes that the mediators are kept fixed at their potential value for $A = a^*$, which shuts down causal mechanisms via the mediator variables (Huber, 2019). Therefore, the natural direct effect of exposure A on outcome W , comparing non-exposure $A = a$ and exposure $A = a^*$, is assessed by setting the mediators to the hypothetical value if exposure had been $A = a^*$ (VanderWeele and Vansteelandt, 2014). The natural direct effect refers to the coefficient of the exposure variable θ_1 in the outcome regression and the corresponding pathway in Fig. 1.

The natural indirect effect (IE), provided in Eq. (6), gives the pathway from the exposure variable to the outcome variable via the two mediator variables, comparing $A = a$

with $A = a^*$. The indirect effect thus corresponds to the change in mean potential outcomes when shifting the mediators to their potential values (under non-exposure $A = a$ and exposure $A = a^*$), but keeping the exposure variable fixed at $A = a$ to shut down the direct effect (Huber, 2019; VanderWeele and Vansteelandt, 2014). This is equal to the sum of the product of the coefficient for the exposure ($\beta_1^{e,i}$) in the two mediator regressions and the coefficients for the mediators ($\theta_2^{e,i}$) in the outcome regression.

How the average controlled direct and indirect effect is defined is conditional on covariates $C = c$ and formally given by Eq. (6):

$$E[c] = \theta_1(a - a^*) \tag{5}$$

$$E[c] = [\beta_1^e \cdot \theta_2^e + \beta_1^i \cdot \theta_2^i](a - a^*) \tag{6}$$

The total effect (TE) is given by the sum of the direct and indirect effect (Gunzler et al. 2013; VanderWeele and Vansteelandt, 2014). In addition, we calculate the ratio between the indirect effect and the total effect (IE/TE) and apply bootstrapping to estimate standard errors following VanderWeele and Vansteelandt (2014).

4 Data

We use data from the second wave of the Austrian Household Finance and Consumption Survey (HFCS), which was conducted between June 2014 and February 2015 by the Austrian Central Bank (OENB, 2016). The survey collects individual and household data on income, wealth, and various socio-economic characteristics to

give a representative sample. The survey includes sample weights and multiple imputations with chained equations to adjust for survey non-response and item non-response for the key variables, as well as 1000 replicate weights for calculating variances and standard errors (OENB, 2016).

The Austrian HFCS data set includes a special module with information on the family background when the respondent was ten years of age. This data allows us to observe different forms of cultural capital: The regular attendance of cultural activities by an individual's family (e.g., theater, museum) serves as an indicator of embodied cultural capital. The estimated number of books at home has been used in the literature as a proxy for objectified cultural capital (Sieben and Lechner, 2019; Mazzonna, 2014). Finally, the father's educational attainment is a proxy for institutionalized parental cultural capital. Using retrospective questions on childhood circumstances is an approach to overcome poor data availability for long-term panel studies over the life cycle. To minimize recall bias, the questionnaire mainly inquires about circumstances or events that might be more memorable than, for instance, the exact wealth or income situation of parents or grandparents. The Austrian HFCS thus offers a unique opportunity to analyze the influence of different aspects of childhood cultural background on adult wealth and its interdependence with education and income. Austria also makes a particularly interesting case study as the country has one of the eurozone's highest wealth inequalities (Ertl et al. 2022).

The Austrian HFCS comprises data on 2997 households and 6189 individuals. We focus on 3011 individuals between 34 and 70 years of age with complete information on all variables of interest. The age threshold accounts for potential life cycle effects. To consider generation-specific differences in net wealth accumulation and cultural capital acquisition, as well as a potential evolution of cultural capital over time, we additionally separate our sample into two age cohorts, namely 35-to-50-year-old and 51-to-70-year-old respondents. Looking at distinct age groups allows us to analyze more closely the changing socio-economic circumstances that underlie cultural capital acquisition, like the expansion of the Austrian educational system in the 1970s. Below we shall briefly outline the main variables of interest in more detail.

4.1 Cultural capital (CC)

To assess the effect of childhood cultural capital (exposure variable) on net wealth, we use three binary variables as proxies for the different forms of CC, as well as a latent variable approach incorporating all three indicators: educational attainment of the father, the number of books the respondent had access to at age ten, and the family's regular attendance of cultural activities at age ten. The father's educational attainment is measured according to the ISCED-2011 classification and transformed into a dummy variable indicating upper-secondary or tertiary education. The number of books in the parental household at age ten is provided in ten categories, ranging from *no available books* to *over 1000 books*. We define a binary variable indicating whether a person had access to more than 100 books as a proxy for objectified cultural capital. Our indicator for embodied CC is a binary variable indicating the regular attendance of cultural activities (e.g., theater) at age ten. We acknowledge that, due to the retrospective nature of the questions the data on childhood cultural capital may be subject to recall bias. However, De Graaf et al. (2000) demonstrate

that while there are indeed differences between respondents and their parents in recalling cultural resources, such as participation in cultural activities and reading habits, these differences are not systematically biased.

4.2 Net wealth

The dependent variable in our analysis is net wealth, which is the sum of a household's real and financial assets minus the sum of all outstanding liabilities. Due to the survey setting, we only obtain information on wealth (a) at the time of the interview, and (b) for households rather than individuals. To allocate household net wealth to individuals, we use a specific question in the Austrian HFCS on the distribution of wealth among all household members (on a percentage scale). We apply the commonly used inverse hyperbolic sine (IHS) transformation to the net wealth distribution to adjust for skewness and account for negative values.

4.3 Education

The first mediator variable is years of formal schooling an individual has completed at the time of interview. The HFCS does not count actual years of schooling but rather the level of educational attainment that corresponds to the ISCED-2011 classification. Thus, we convert educational attainment into years typically spent in education for the regression analysis to obtain the highest level reported.

4.4 Income

The logarithmic individual annual gross income serves as the second mediator variable. This includes income from employment and self-employment, pensions, unemployment benefits, income from renting or leasing, investment income, and social transfers. Since income from renting, leasing, and investments is only available on a household level, we allocate it to household members based on the distribution of household wealth. Similarly, social transfers are only available for the entire household, so we divide them by the number of adults living in the household.

4.5 Covariates

Furthermore, the econometric model contains several individual and household socio-economic control variables. At the individual level, we include gender, occupational status, and migrant background (binary variables), as well as age, working hours, and residual household income (numeric variables). Residual household income refers to the personal income of other household members. At the household level, the number of children and adults living in the same household (numeric variables) and two binary variables, which indicate whether a respondent has received any inheritances and whether the family is renting its main residence, serve as control variables.

Table 1 displays information on the characteristics of our full sample of 3864 individuals aged between 34 and 70. On average, individual net wealth amounts to roughly €184,200, but the median value is much lower (€78,100). Approximately

Table 1 Descriptive statistics (≥ 35 and ≤ 70 years of age)

Variable	Mean	SD	Q25	Median	Q75	Min	Max
Net wealth (IHS)	10.18	5.19	10.0	12.0	12.91	-13	18
Net wealth (thous.)	184.29	1066.39	10.5	78.1	202.05	-331	41,547
Education father: higher sec. or tertiary	0.14	0.35	0.0	0.0	0.00	0	1
>100 books (at age 10)	0.15	0.36	0.0	0.0	0.00	0	1
Regular cultural activities (at age 10)	0.29	0.45	0.0	0.0	0.14	0	1
Years of schooling	12.52	2.51	11.1	11.5	12.88	0	19
Log. monthly gross income	9.80	1.50	9.6	10.1	10.47	0	13
Yearly gross income (thous.)	27.36	22.37	14.4	23.8	35.13	0	427
Log. monthly residual income	7.89	4.25	8.5	10.0	10.52	0	13
Yearly residual hh income (thous.)	26.05	27.89	4.7	21.0	37.08	0	431
Inheritance received	0.30	0.46	0.0	0.0	0.17	0	1
Age	52.93	9.89	44.3	52.5	61.07	35	70
Gender: male	0.47	0.50	0.0	0.0	0.47	0	1
Migrant	0.11	0.31	0.0	0.0	0.00	0	1
Labor status: working	0.60	0.49	0.0	0.5	0.59	0	1
Labor status: retired	0.30	0.46	0.0	0.0	0.18	0	1
Labor status: unemployed	0.03	0.18	0.0	0.0	0.00	0	1
Labor status: out of labor force	0.06	0.23	0.0	0.0	0.00	0	1
Working hours	23.26	20.38	0.0	29.8	39.74	0	90
Number of children living in hh.	0.21	0.53	0.0	0.0	0.00	0	4
Number of adults living in hh.	1.98	0.75	1.0	1.5	1.83	1	6
Renting main residence	0.37	0.48	0.0	0.0	0.32	0	1

14% of respondents report that their father completed higher secondary or tertiary education, and 15% of individuals had access to more than 100 books at the age of ten. 29% state that their family regularly attended cultural activities when they were 10 years old. The average and median figures for individual gross income per annum are €27,360 and €21,000, respectively. The mean value for years spent in schooling is 12.5, the mean age is 53, and 30% of all respondents have already received an inheritance. 47% of the sample are male and 11% have a migrant background.

Kraaykamp and van Eijck (2010) show that the three forms of cultural capital previously mentioned cannot each perform all CC functions, but instead represent distinct aspects of it. Moreover, the role of the different manifestations of CC, that Bourdieu originally developed in the 1960s and 1970s, as well as the relevance of the empirical indicators might change over time. For instance, the socio-economic circumstances that lead to CC acquisition gradually changed during the 1970s and 1980s in Austria (Bildungsexpansion), by facilitating access to higher education. This might render educational attainment a less effective indicator of institutionalized cultural capital. We thus analyze two different age groups: individuals between i) 35 and 50 years of age and ii) 51 and 70 years of age. The older group was born between

1944 and 1963, and the younger cohort between 1964 and 1979. This allows us to consider the effects of the Austrian educational expansion as the policy would have already impacted the younger cohort. The expansion of schools and universities, together with the dismantling of some financial hurdles, allowed more children, especially those whose parents have lower levels of educational attainment, to prolong their educational careers and even enroll at university.

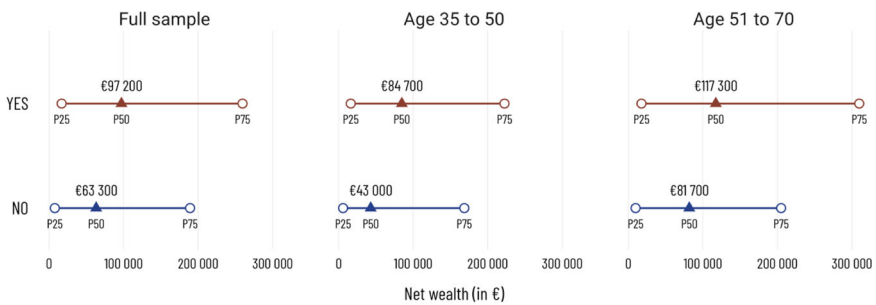
Appendix A shows descriptive statistics by cohort in Tables 5 and 6. The mean-to-median ratio confirms that wealth inequality is higher for older cohorts than for individuals younger than 51 years. Moreover, the average number of school years increases by approximately half a year for individuals born after 1963, compared to the older cohort. The percentage of individuals who had a father with a higher secondary or tertiary degree is 5%-points higher for the younger cohort. The share of individuals with access to more than 100 books and regular attendance of cultural activities at the age of ten increased by 2%-points and 14%-points, respectively.

There might be a considerable correlation between the three measures for cultural capital. We thus calculate Pearson's product-moment correlation coefficients to test for the association between the indicators. The father's education and the number of books are most strongly correlated (0.40 for the full sample), whereas the father's education and the attendance of cultural activities (0.35 for the full sample) as well as the number of books and the attendance of cultural activities are slightly less associated (0.31 for the full sample). Even though the correlation coefficients are highly significant, we conclude that there is sufficient difference between the three indicators to warrant individual analysis. This is because they still capture different aspects of cultural capital. Looking at the correlation coefficients for the two age groups separately, we find a stronger correlation for the older cohort: i) father's education and the number of books (0.34 for the younger cohort vs 0.40 for the older cohort), ii) father's education and the attendance of cultural activities (0.30 for the younger cohort vs 0.38 for the older cohort) and iii) the number of books and the attendance of cultural activities (0.23 for the younger cohort vs 0.38 for the older cohort). To analyze the cohort and age-specific effects of CC, we further distinguish between the three age groups throughout the paper.

As a first descriptive reference point, Fig. 2 shows the distribution of net wealth with respect to the cultural capital indicators for the three samples. Each panel provides information on the distribution of net wealth, by showing the 25th, 50th and 75th percentile of the net wealth distribution. In the full sample, the difference in median net wealth is highest between individuals whose father has a higher secondary or tertiary degree (€135,300, see Fig. 2 / Panel a) and those whose father does not (€59,900; difference: €75,400), followed by the proxy variable for the embodied state of cultural capital with a median difference of €63,000 (see Fig. 2 / Panel c). The median net wealth of individuals with access to more than 100 books at the age of ten (€97,200, see Fig. 2 / Panel b) is also significantly higher than in the counterfactual group (€63,300; difference: €33,900). If we look at the two age groups separately, we find that the differences in net wealth remain quite substantial, ranging between €41,700 and €78,600 for the younger age group and €35,600 and €66,300 for the older cohort.



(a) Institutionalised CC: High educational attainment of father?



(b) Objectified CC: More than 100 books in the parental household?



(c) Embodied CC: Regularly attended cultural activities?

Fig. 2 Dispersion of net wealth by variables of cultural capital and age groups

5 Results

The descriptive evidence has shown substantial individual net wealth differences in line with the occurrence of childhood cultural capital. In addition, there is an age-specific variation in the correlation between the three cultural capital indicators. We thus discuss the potential average direct and indirect effects of cultural capital on net wealth—via education and income using structural equation models—for the full

Table 2 Direct, indirect and total effects of mediation analysis (≥ 35 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.808*** (0.138)	0.538*** (0.098)	0.436*** (0.095)	1.826*** (0.489)
direct effect (DE)	-0.096 (0.352)	0.251 (0.273)	0.583** (0.252)	0.854 (0.883)
total effect (TE)	0.712** (0.341)	0.789*** (0.281)	1.018*** (0.243)	2.680*** (0.688)
IE/TE	1.135** (0.554)	0.682*** (0.243)	0.428*** (0.131)	0.681** (0.265)
Num.Obs.	3011	3011	3011	3011
AIC	39,708.4	39,978.3	39,907.9	49,813.9
BIC	39,918.7	40,188.7	40,118.2	50,096.3

** $p < 0.05$, *** $p < 0.01$

NW net wealth, EF education father, B = > 100 books, CA cultural activities. Full results including covariates are available in Table 7

sample (Section 5.1) and the two age groups (Section 5.2) separately. In the following section, we focus on the main results for the CC indicators. The full specification of the models is available in Appendix A.

5.1 Full sample

Table 2 presents the main findings of the mediation analysis for the full sample (see Appendix A Table 7 for detailed results). Columns (1)–(3) show the results for the three manifestations of cultural capital, i.e., higher educational attainment of the father (EF), access to more than 100 books (B), and regular attendance of cultural activities (CA). Column (4) then presents the latent variable approach that incorporates the three aforementioned indicators. The dependent variable in all specifications is IHS-transformed individual net wealth (NW). The two mediator variables are log. individual gross income and years of schooling. In addition, we control for a wide range of covariates as described in Section 4.

Our results show highly significant and substantial indirect effects for the three CC indicators and the latent variable approach, suggesting cultural family background has long-lasting effects on net wealth via education and income. Models (1) to (3) show highly significant total effects, indicating an approximate average net wealth increase between 70% and 100% for individuals who experienced different manifestations of cultural capital at a young age. The latent variable approach (4)—considering all three indicators at once—leads to even more substantial effects (270%). The large magnitude of the effects may result from the idiosyncratic shape of the Austrian net wealth distribution, characterized by almost no wealth among the bottom 40% and a steep increase at the top end (see Table 1 for more detailed descriptive statistics). Consequently, even moderate changes in absolute net wealth can lead to significant percentage changes and, therefore, high elasticities. In addition, model (3) (embodied CC) shows significant, positive direct effects, indicating that endowment with high embodied cultural capital might positively affect wealth accumulation directly. According to Kraaykamp and van Eijck (2010), the reproduction of the embodied state of

cultural capital is especially powerful, as the cultural socialization provided by parents is closely tied to an individual's body and brain (referred to as "habitus"). Consequently, individuals endowed with high embodied cultural capital might be better equipped to navigate social structures or possess distinct "soft skills" that allow them to accumulate wealth directly, independent of education and income. Factors that correlate with the embodied cultural capital and influence wealth accumulation, such as assortative mating, social networks, and patronage, may also be captured by this term. In contrast, our indicators for institutionalized CC (1) and objectified CC (2) do not show statistically significant direct effects, thus signaling full mediation. This indicates that a high number of books at age ten and a father's high educational attainment primarily influence later life net wealth via education and income. We find that if the father has a higher secondary or tertiary degree, this increases the child's years of schooling by 3 years on average and the child's income by 21% (see Appendix A Table 7). Having more than 100 books at age ten leads, on average, to 2.1 more years of schooling and 13% more income. Moreover, a family's regular attendance of cultural activities significantly increases the child's years of schooling by 1.8 years and income by 14%. If all three states of an individual's CC are high (model 4), years of schooling increase, on average, by 7.7 years and income by 70%.

Let us briefly summarize the most important findings on the additional control variables (see Appendix A Table 7): being male has a significant positive effect on years of schooling and income, but a negative effect on average wealth. Age has a significant negative effect on years of schooling and income, but a significant positive effect on individual net wealth. Migrant background is negatively associated with years of schooling and net wealth. More working hours significantly positively affect income, whereas being inactive tends to decrease income (compared to employed individuals). Moreover, a higher number of adults living in a household and renting the main residence significantly negatively affect individual net wealth. The receipt of an inheritance, representing the main direct channel through which parental economic capital affects descendant net wealth, shows a highly significant positive effect in all model specifications.

5.2 Age groups

In a next step, we perform the mediation analysis for the two age cohorts separately: i) individuals aged 35 to 50 and ii) individuals aged 51 to 70. Again, Tables 3 and 4 highlight the main findings of the mediation analysis, while Appendix A Tables 8 and 9 provide detailed results.

Like the full sample, the model outputs show highly significant and substantial indirect effects for all CC indicators on net wealth via education and income for both age groups. The individual indirect effects of the father's educational attainment (institutionalized CC), having access to more than 100 books (objectified CC) and attending cultural activities (embodied CC) at age ten are of similar size for both age groups. However, if we look at all three indicators together (model 4), we find that the indirect effect of cultural capital on individual net wealth is significantly more pronounced for the younger group.

Table 3 Direct, indirect and total effects of mediation analysis (≥35 and ≤50 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.779*** (0.238)	0.564*** (0.179)	0.402*** (0.148)	2.596*** (0.984)
direct effect (DE)	-0.394 (0.599)	0.088 (0.460)	0.426 (0.441)	-0.391 (2.004)
total effect (TE)	0.385 (0.630)	0.651 (0.506)	0.828* (0.452)	2.205 (1.610)
IE/TE	2.023 (3.170)	0.865 (0.609)	0.485* (0.283)	1.177 (1.024)
Num.Obs.	1281	1281	1281	1281
AIC	16,753.6	16,882.4	16,886.6	21,607.0
BIC	16,934.1	17,062.8	17,067.0	21,849.3

NW net wealth, EF education father, B => 100 books, CA cultural activities. Full results including covariates are available in Table 8

*p < 0.1, ***p < 0.01

Table 4 Direct, indirect and total effects of mediation analysis (≥51 and ≤70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.814*** (0.159)	0.510*** (0.124)	0.486*** (0.117)	1.473*** (0.425)
direct effect (DE)	0.171 (0.312)	0.376 (0.287)	0.613** (0.275)	1.302* (0.727)
total effect (TE)	0.985*** (0.314)	0.886*** (0.275)	1.099*** (0.265)	2.775*** (0.600)
IE/TE	0.826*** (0.270)	0.575*** (0.212)	0.442*** (0.140)	0.531*** (0.189)
Num.Obs.	1730	1730	1730	1730
AIC	22,656.3	22,799.3	22,724.3	27,755.5
BIC	22,847.3	22,990.3	22,915.2	28,011.9

*p < 0.1, **p < 0.05, ***p < 0.01

NW net wealth, EF education father, B => 100 books, CA cultural activities. Full results including covariates are available in Table 9

Direct effects are only statistically significant for the older cohort in some specifications. Attending cultural activities (embodied CC) as well as the latent variable approach show a direct effect on net wealth which is not attributable to education or income. In contrast, we do not find significant direct effects for younger individuals. In the younger cohort, we only note statistically significant total effects for cultural activities, where the coefficient indicates an average net wealth increase of 83%. The indirect effect as a share of the total effect accounts for 49% of the embodied cultural capital. The older age group, however, features significant total effects for all CC indicators, corresponding to an increase in net wealth between 88% and 100% for individual CC indicators, and 278% for the latent variable approach. Finally, the indirect effect as a share of the total effect ranges between 44% (embodied CC) and 83% (institutionalized CC).

On the one hand, the total effects for the two age groups suggest that either the role of cultural capital or the role of the indicators is changing over time, for example due to the expansion of educational attainment during the 1970s and 1980s, as mentioned above. This is also in line with the results of existing literature, e.g.,

Kraaykamp and Notten (2016) find that the effect of parental education on a child's own educational attainment decreases for younger cohorts due to an increasing openness in education. On the other hand, it could also be the case that the direct effects of CC on net wealth have not yet fully materialized for younger individuals. Unfortunately, we are unable to differentiate between age and cohort effects as we only have access to cross-sectional data.

Turning to the mediator variables, we find that the effect of all CC states on years of schooling is more pronounced for older cohorts (see Tables 8 and 9). The three different CC states increase average years of schooling for older cohorts by 3.1 years (institutionalized CC), 2.2 years (objectified CC), and 2.1 years (embodied CC), whereas the effect for the younger cohort only amounts to 2.8, 2.0, and 1.5 years respectively. In contrast, the latent variable approach, which incorporates all three states of CC, leads to a smaller increase in years of schooling (7.1 years) for older individuals compared to younger respondents (8.4 years). This is in line with our descriptive results, indicating decreasing correlations between the different CC forms, i.e., single indicators are less important for the educational attainment of younger cohorts but are very strong predictors of educational success if we consider all three CC states simultaneously. Furthermore, our results suggest that all forms of CC significantly affect the income of younger individuals. For older respondents only the institutionalized CC and the latent variable approach lead to a statistically significant increase in income.

6 Robustness checks

We provide a set of robustness tests in Appendix B for the full sample and in Appendix C for the two age groups separately. These checks are based on the specification and inclusion of the exposure variables, variation in the dependent variable, and sample composition. First, we use alternative (binary) indicators for the institutionalized state of CC: (1) tertiary education of the father, (2) higher secondary or tertiary education of the mother, (3) tertiary education of the mother, and (4) an indicator showing if a grandfather had any kind of academic occupation (see Tables 10, 18 and 19). Our findings suggest that different indicators for the institutionalized CC do not substantially alter the significance and direction of the indirect effects, thus our main results are robust. However, the effect sizes are slightly smaller, especially if we use the grandfather's occupation as a proxy variable. Additionally, the model with tertiary education of the father leads to a significant direct effect for the older cohort. This could be due to the historical context in which higher (university) education was less widespread and more highly valued. For our next robustness test, we adjust the threshold for the objectified CC variable from having over 100 books to over 50 books and over 200 books (see Tables 11, 20 and 21). The results are robust, with "over 50 books" leading to slightly smaller and "over 200 books" to slightly larger indirect effects, aligning with our expectations.

In our main analysis, we account for inheritances with a binary variable indicating whether a person has already received any form of inheritance. As the value of inheritances might vary substantially, Tables 12, 22 and 23 show the results for the

logarithm of the absolute inherited value as an alternative indicator. Based on the reported year and the face value of the wealth transfer, we compute actual inheritance values by supposing an average real interest rate of 3% per year (Wolff and Gitelman, 2014). This alternative specification does not alter our main findings. Moreover, we include all CC indicators as additional explanatory variables to check if the effect of one CC indicator remains significant when we control for the impact of all other CC forms (see Tables 13, 24 and 25). We find that the direct and indirect effects of our main analysis remain positive and highly significant. However, as the different CC indicators are correlated, the effect sizes are somewhat smaller. This is in line with our expectations.

Furthermore, Tables 14, 26 and 27 present the main results if we use the logarithm of gross wealth instead of net wealth as the dependent variable. We also find positive and highly significant indirect effects. However, the size of the effects is even larger than in our main analysis. Moreover, the direct effect of model (4) is positive and significant for our full sample (in contrast to our main analysis). This might be due to the fact that gross wealth does not account for liabilities, leading to an overestimation of the effect. In addition, we conduct another robustness check utilizing a different variable to assign net wealth within households. Our dataset includes two distinct types of variables for this purpose: the share of net wealth that individuals formally own and the share of net wealth over which they have decision-making power. While our main analysis relies on the former variable, the robustness check using the latter reveals no significant alteration in the main results (see Tables 15, 28 and 29). The only difference is that for the older cohort, we do not observe any direct effects in this specification. However, the finding that the total effects are substantially larger for the older cohort compared to the younger remains consistent.

Finally, we present results for two subsets with varying age thresholds: individuals aged between 35 and 45, and individuals aged between 55 and 70 (see Tables 16 and 17). The results for the reduced age groups do not change substantially and we conclude that fixing the age threshold at 50 does not considerably influence the outcome. Overall, the various robustness checks do not alter the results in any unexpected way. We are thus confident that the main findings are robust.

7 Discussion

This paper studies the effects of childhood cultural capital on private wealth in Austria. We find a significant positive link between individual net wealth and indicators for institutionalized, objectified, and embodied states of cultural capital, as well as a latent variable approach incorporating all three forms at once. The results from structural equation models suggest that the total effect of CC on net wealth mainly stems from indirect effects via education and income. However, we also find positive direct effects for some specifications, such as the attendance of cultural activities in childhood. The direct effect includes all variables that might be associated with childhood cultural capital, such as financial literacy, savings preferences, soft skills, and risk aversion, as long as they are not captured by education and

income. Due to data limitations, we are not able to evaluate these channels individually, however, the small coefficients for the direct effect suggest a minor role of these factors.

We find distinct cohort effects that indicate particularly strong effects for an older age group of 51-to-70-year-olds and a less pronounced and only partially significant nexus for younger individuals between 35 and 50 years of age. The role of cultural capital may thus have altered during the course of social change, for instance, due to educational expansion and technological change that may have facilitated access to cultural capital and reduced intergenerational persistence. A series of robustness tests suggests the validity of our results with regard to the choice of indicators, variable definitions, and the selection of the separate age groups.

However, these results should be interpreted with caution as the empirical analysis has a few limitations. It cannot be ruled out that we have unwittingly omitted variables and interdependencies that correlate with net wealth, which could potentially lead to an overestimation of the direct effects in our estimations. For instance, we do not have information on social capital, even though it is supposed to be closely intertwined with cultural capital. Parents with a strong cultural background might also provide their children with valuable contacts and social networks, which could affect choices and opportunities for income and wealth accumulation (Kraaykamp and Notten, 2016). Roaldsnes (2024) finds evidence of Bourdieu's multiplier effect: when parents have high amounts of social capital, this multiplies the effect of parental cultural capital on children's cultural exposure. Further evidence shows significant wage premiums for individuals who find their job via networks rather than conventional job search (McDonald, 2015), and higher adult income for children with connections to children from higher social classes (Chetty et al. 2022). Thus, social capital matters for wealth accumulation but HFCS does not provide the proper information.

Furthermore, we sound a note of caution regarding the data used in our analysis. First, voluntary wealth surveys typically suffer from differential non-response and under-reporting by the wealthy who might be of particular interest for our research question. Readers should thus be aware that the top tier of wealth distribution is missing from our analysis. Second, the proxies for cultural capital are prone to measurement error as well. For instance, the number of books in the parental household may be subject to reporting errors (Jerrim and Micklewright, 2014), memory bias (Sieben and Lechner, 2019), and endogeneity bias (Engzell, 2021). In addition, the binary question concerning the *regular* attendance of cultural activities at age 10 is rather imprecise and open to differing interpretations by survey respondents. Third, we only have cross-sectional data available, preventing us from evaluating life-cycle wealth accumulation and thus distinguishing between cohort and age effects. Despite its various flaws, the Austrian HFCS offers unique possibilities to analyze the links between childhood circumstances and adult wealth.

Our study entails important policy implications. The results highlight that family background not only matters for socio-economic outcomes such as educational attainment and income, but also has significant implications for the endowment of wealth later in life. Individuals with access to childhood cultural

capital are able to convert this into economic capital. This head start affects perceptions of fairness in society as it counteracts intergenerational mobility, undermines equality of opportunity, and adds to wealth disparities. Bukodi and Goldthorpe (2018) show that educational policies alone are not able to break the close link between unequal starting conditions and inequality of opportunity. Thus, the calls for policy responses range from ex-ante measures to ensure equal access to cultural capital for all children to ex-post policies focused on reducing existing wealth inequalities. However, social policy can do little to impact cultural background, especially in the case of the embodied form of CC, which is mainly accumulated by children who intuitively observe and emulate the behavior and judgments of their parents (Kraaykamp and Notten, 2016). This points to the importance of diminishing the relationship between the embodied and institutionalized forms of CC by creating more equal educational opportunities. In this vein, policy makers can play a crucial role in compensating endowments of less privileged families. Large international organizations, such as the OECD and the World Bank, have identified early investments in childcare, preventing adolescents from dropping out of school, and promoting inclusive housing policies to be among the most effective measures to level the playing field (OECD, 2018, 20; Narayan et al. 2018). Moreover, access to books at a young age is associated with better cognitive and socio-emotional skills, which in turn increase returns to education (Brunello et al. 2017). Therefore, lower financial hurdles and more openness in regard to highbrow cultural goods may enhance social mobility (Kraaykamp and Notten, 2016). Affordable access to and broad public provision of (objectified) cultural capital, like libraries, museums, and theaters are viable measures against the private concentration of cultural capital—especially on the countryside.

As private wealth is much more unevenly distributed than income, and these inequalities tend to persist over generations (Nekoei and Seim, 2022; Ertl et al. 2022; Adermon et al. 2018; Clark and Cummins, 2015; Hansen, 2014), the OECD proposes the introduction of sufficient property and inheritance taxes, and the redirection of these revenues into policy measures that foster public wealth and social mobility (OECD, 2018).

Author contributions M.S. prepared the figures. E.S. conducted the quantitative analysis. Both authors wrote the main manuscript together.

Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

8 Appendix

A. Descriptive statistics and detailed results of mediation analysis by age group
Tables 5–9.

Table 5 Descriptive statistics (≥ 35 and ≤ 50 years of age)

Variable	Mean	SD	Q25	Median	Q75	Min	Max
Net wealth (IHS)	9.71	5.76	9.63	11.7	12.794	-13	16
Net wealth (thous.)	143.83	405.46	7.64	59.3	180.109	-214	6691
Education father: higher sec. or tertiary	0.17	0.37	0.00	0.0	0.000	0	1
>100 books (at age 10)	0.16	0.37	0.00	0.0	0.000	0	1
Regular cultural activities (at age 10)	0.37	0.48	0.00	0.0	0.322	0	1
Years of schooling	12.82	2.40	11.17	11.5	13.195	0	19
Log. monthly gross income	9.99	1.19	9.75	10.2	10.533	0	13
Yearly gross income (thous.)	29.60	21.11	17.23	26.0	37.538	0	346
Log. monthly residual income	8.33	4.01	9.15	10.1	10.610	0	13
Yearly residual hh income (thous.)	28.79	29.48	9.39	24.4	40.547	0	431
Inheritance received	0.27	0.44	0.00	0.0	0.073	0	1
Age	43.09	4.57	38.76	42.5	46.416	35	50
Gender: male	0.48	0.50	0.00	0.0	0.481	0	1
Migrant	0.14	0.35	0.00	0.0	0.000	0	1
Labor status: working	0.88	0.32	0.15	0.5	0.716	0	1
Labor status: retired	0.02	0.15	0.00	0.0	0.000	0	1
Labor status: unemployed	0.04	0.20	0.00	0.0	0.000	0	1
Labor status: out of labor force	0.05	0.23	0.00	0.0	0.000	0	1
Working hours	33.64	15.07	25.64	38.8	39.897	0	90
Number of children living in hh.	0.31	0.63	0.00	0.0	0.000	0	4
Number of adults living in hh.	1.97	0.68	1.08	1.5	1.800	1	6
Renting main residence	0.41	0.49	0.00	0.0	0.384	0	1

Table 6 Descriptive statistics (≥ 51 and ≤ 70 years of age)

Variable	Mean	SD	Q25	Median	Q75	Min	Max
Net wealth (IHS)	10.54	4.68	10.159	12.2	12.99	-13	18
Net wealth (thous.)	214.24	1341.14	12.910	97.8	218.72	-282	41,547
Education father: higher sec. or tertiary	0.12	0.33	0.000	0.0	0.00	0	1
>100 books (at age 10)	0.14	0.35	0.000	0.0	0.00	0	1
Regular cultural activities (at age 10)	0.23	0.42	0.000	0.0	0.00	0	1
Years of schooling	12.31	2.56	10.831	11.5	12.63	0	19
Log. monthly gross income	9.67	1.68	9.487	10.0	10.39	0	13
Yearly gross income (thous.)	25.70	22.89	13.190	21.4	32.41	0	338
Log. monthly residual income	7.57	4.40	3.787	9.8	10.44	0	13
Yearly residual hh income (thous.)	24.02	26.38	0.044	18.7	34.30	0	280
Inheritance received	0.33	0.47	0.000	0.0	0.24	0	1
Age	60.21	5.48	54.920	59.5	64.16	51	70
Gender: male	0.47	0.50	0.000	0.0	0.47	0	1
Migrant	0.09	0.28	0.000	0.0	0.00	0	1
Labor status: working	0.40	0.49	0.000	0.0	0.37	0	1
Labor status: retired	0.51	0.50	0.000	0.5	0.51	0	1
Labor status: unemployed	0.03	0.17	0.000	0.0	0.00	0	1
Labor status: out of labor force	0.06	0.24	0.000	0.0	0.00	0	1
Working hours	15.58	20.39	0.000	0.0	37.98	0	90
Number of children living in hh.	0.13	0.44	0.000	0.0	0.00	0	4
Number of adults living in hh.	2.00	0.79	1.018	1.5	1.86	1	6
Renting main residence	0.34	0.47	0.000	0.0	0.26	0	1

Table 7 Detailed results of mediation analysis (≥ 35 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF.B.CA
years of school. ~ CC	2.960*** (0.207)	2.143*** (0.193)	1.844*** (0.123)	7.701*** (0.635)
years of school. ~ male	0.615*** (0.088)	0.613*** (0.088)	0.639*** (0.089)	0.660*** (0.081)
years of school. ~ age	-0.025*** (0.005)	-0.027*** (0.005)	-0.018*** (0.005)	-0.019*** (0.004)
years of school. ~ migrant	-0.413** (0.175)	-0.145 (0.172)	-0.075 (0.172)	-0.289* (0.150)
log.income ~ CC	0.206*** (0.066)	0.125* (0.069)	0.143** (0.064)	0.702*** (0.166)
log.income ~ years of school.	0.082*** (0.011)	0.089*** (0.011)	0.086*** (0.010)	0.061*** (0.012)
log.income ~ male	0.362*** (0.031)	0.360*** (0.030)	0.365*** (0.030)	0.380*** (0.032)
log.income ~ age	-0.016*** (0.005)	-0.016*** (0.005)	-0.016*** (0.005)	-0.016*** (0.005)
log.income ~ migrant	-0.015 (0.090)	0.007 (0.090)	0.010 (0.089)	-0.010 (0.090)
log.income ~ sum child.	0.043 (0.056)	0.041 (0.055)	0.041 (0.055)	0.045 (0.055)
log.income ~ sum adults	-0.038 (0.093)	-0.043 (0.092)	-0.036 (0.092)	-0.034 (0.091)
log.income ~ work. hours	0.020*** (0.002)	0.020*** (0.002)	0.020*** (0.002)	0.020*** (0.002)
log.income ~ LS:retired	0.712*** (0.129)	0.699*** (0.128)	0.710*** (0.128)	0.708*** (0.129)
log.income ~ LS:unemployed	-0.011 (0.110)	-0.021 (0.109)	-0.014 (0.110)	-0.018 (0.111)
log.income ~ LS:inactive	-3.515*** (0.403)	-3.523*** (0.405)	-3.512*** (0.403)	-3.523*** (0.403)
log.income ~ log. resid income	-0.017 (0.012)	-0.016 (0.011)	-0.017 (0.012)	-0.017 (0.011)
log.income ~ inherited	0.107* (0.062)	0.108* (0.063)	0.125** (0.062)	0.104* (0.062)
log.income ~ renting	-0.065 (0.059)	-0.074 (0.060)	-0.068 (0.060)	-0.074 (0.059)
netwealth (ihs) ~ CC	-0.096 (0.352)	0.251 (0.273)	0.583** (0.252)	0.854 (0.883)
netwealth (ihs) ~ log.income	0.449*** (0.079)	0.447*** (0.080)	0.438*** (0.079)	0.442*** (0.080)
netwealth (ihs) ~ years of school.	0.242*** (0.044)	0.225*** (0.043)	0.202*** (0.045)	0.197*** (0.054)
netwealth (ihs) ~ male	-0.536*** (0.171)	-0.521*** (0.173)	-0.486*** (0.169)	-0.495*** (0.170)
netwealth (ihs) ~ age	0.048*** (0.012)	0.049*** (0.012)	0.051*** (0.012)	0.048*** (0.012)
netwealth (ihs) ~ migrant	-1.683*** (0.472)	-1.694*** (0.465)	-1.676*** (0.466)	-1.716*** (0.466)
netwealth (ihs) ~ sum child.	0.113 (0.252)	0.119 (0.252)	0.117 (0.253)	0.123 (0.254)
netwealth (ihs) ~ sum adults	-0.496** (0.193)	-0.490** (0.190)	-0.463** (0.193)	-0.482** (0.190)
netwealth (ihs) ~ log. resid income	0.109*** (0.035)	0.109*** (0.035)	0.105*** (0.035)	0.108*** (0.035)
netwealth (ihs) ~ inherited	0.855*** (0.229)	0.826*** (0.230)	0.871*** (0.241)	0.830*** (0.239)
netwealth (ihs) ~ renting	-3.566*** (0.255)	-3.584*** (0.256)	-3.578*** (0.255)	-3.577*** (0.255)
indirect effect (IE)	0.808*** (0.138)	0.538*** (0.098)	0.436*** (0.095)	1.826*** (0.489)
direct effect (DE)	-0.096 (0.352)	0.251 (0.273)	0.583** (0.252)	0.854 (0.883)
total effect (TE)	0.712** (0.341)	0.789*** (0.281)	1.018*** (0.243)	2.680*** (0.688)
IE/TE	1.135** (0.554)	0.682*** (0.243)	0.428*** (0.131)	0.681** (0.265)
Num.Obs.	3011	3011	3011	3011
AIC	39,708.4	39,978.3	39,907.9	49,813.9
BIC	39,918.7	40,188.7	40,118.2	50,096.3

NW net wealth, EF education father, B ≥ 100 books, CA cultural activities

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8 Detailed results of mediation analysis (≥ 35 and ≤ 50 years of age)

	(1) EF	(2) B	(3) CA	(4) EF.B.CA
years of school. ~ CC	2.814*** (0.267)	2.063*** (0.287)	1.543*** (0.185)	8.412*** (1.017)
years of school. ~ male	0.316*** (0.121)	0.313*** (0.120)	0.376*** (0.121)	0.358*** (0.121)
years of school. ~ age	-0.010 (0.018)	-0.013 (0.018)	-0.022 (0.018)	-0.009 (0.015)
years of school. ~ migrant	-0.421* (0.249)	-0.187 (0.246)	-0.056 (0.245)	-0.229 (0.228)
log.income ~ CC	0.178** (0.081)	0.216** (0.090)	0.183*** (0.069)	1.033*** (0.274)
log.income ~ years of school.	0.074*** (0.015)	0.076*** (0.014)	0.075*** (0.013)	0.035* (0.018)
log.income ~ male	0.299*** (0.051)	0.302*** (0.051)	0.311*** (0.051)	0.318*** (0.052)
log.income ~ age	-0.006 (0.008)	-0.006 (0.008)	-0.007 (0.008)	-0.006 (0.008)
log.income ~ migrant	-0.083 (0.104)	-0.064 (0.103)	-0.053 (0.104)	-0.079 (0.105)
log.income ~ sum child.	0.042 (0.055)	0.036 (0.055)	0.043 (0.056)	0.050 (0.055)
log.income ~ sum adults	-0.218* (0.129)	-0.220* (0.128)	-0.211 (0.129)	-0.212* (0.128)
log.income ~ work. hours	0.022*** (0.003)	0.022*** (0.003)	0.022*** (0.003)	0.022*** (0.003)
log.income ~ LS:retired	0.375** (0.161)	0.346** (0.159)	0.373** (0.160)	0.373** (0.160)
log.income ~ LS:unemployed	0.141 (0.157)	0.125 (0.157)	0.138 (0.157)	0.119 (0.161)
log.income ~ LS:inactive	-2.210*** (0.427)	-2.234*** (0.431)	-2.198*** (0.426)	-2.227*** (0.430)
log.income ~ log. resid income	0.015 (0.014)	0.016 (0.014)	0.014 (0.014)	0.015 (0.014)
log.income ~ inherited	0.044 (0.085)	0.036 (0.085)	0.066 (0.086)	0.044 (0.084)
log.income ~ renting	-0.109* (0.065)	-0.118* (0.065)	-0.103 (0.066)	-0.109* (0.066)
netwealth (ihs) ~ CC	-0.394 (0.599)	0.088 (0.460)	0.426 (0.441)	-0.391 (2.004)
netwealth (ihs) ~ log.income	0.645*** (0.163)	0.641*** (0.164)	0.625*** (0.165)	0.648*** (0.165)
netwealth (ihs) ~ years of school.	0.236*** (0.081)	0.206** (0.084)	0.186** (0.089)	0.229** (0.102)
netwealth (ihs) ~ male	-0.619** (0.262)	-0.604** (0.264)	-0.568** (0.260)	-0.619** (0.257)
netwealth (ihs) ~ age	0.126*** (0.039)	0.127*** (0.039)	0.125*** (0.038)	0.126*** (0.038)
netwealth (ihs) ~ migrant	-1.700** (0.709)	-1.737** (0.703)	-1.706** (0.702)	-1.731** (0.707)
netwealth (ihs) ~ sum child.	-0.171 (0.366)	-0.148 (0.365)	-0.126 (0.364)	-0.157 (0.365)
netwealth (ihs) ~ sum adults	-0.487 (0.330)	-0.479 (0.333)	-0.458 (0.337)	-0.481 (0.335)
netwealth (ihs) ~ log. resid income	0.137** (0.062)	0.136** (0.063)	0.133** (0.062)	0.136** (0.063)
netwealth (ihs) ~ inherited	0.994** (0.439)	0.973** (0.435)	1.015** (0.465)	0.982** (0.451)
netwealth (ihs) ~ renting	-3.737*** (0.461)	-3.732*** (0.457)	-3.710*** (0.456)	-3.731*** (0.457)
indirect effect (IE)	0.779*** (0.238)	0.564*** (0.179)	0.402*** (0.148)	2.596*** (0.984)
direct effect (DE)	-0.394 (0.599)	0.088 (0.460)	0.426 (0.441)	-0.391 (2.004)
total effect (TE)	0.385 (0.630)	0.651 (0.506)	0.828* (0.452)	2.205 (1.610)
IE/TE	2.023 (3.170)	0.865 (0.609)	0.485* (0.283)	1.177 (1.024)
Num.Obs.	1281	1281	1281	1281
AIC	16,753.6	16,882.4	16,886.6	21,607.0
BIC	16,934.1	17,062.8	17,067.0	21,849.3

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ NW net wealth, EF education father, B ≥ 100 books, CA cultural activities

Table 9 Detailed results of mediation analysis (≥ 51 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF.B.CA
years of school. ~ CC	3.117*** (0.287)	2.222*** (0.243)	2.135*** (0.173)	7.114*** (0.650)
years of school. ~ male	0.837*** (0.109)	0.835*** (0.110)	0.827*** (0.111)	0.880*** (0.102)
years of school. ~ age	-0.038*** (0.014)	-0.036*** (0.014)	-0.026* (0.013)	-0.031*** (0.011)
years of school. ~ migrant	-0.407 (0.262)	-0.101 (0.260)	-0.151 (0.262)	-0.371* (0.196)
log.income ~ CC	0.221* (0.123)	0.002 (0.102)	0.108 (0.111)	0.424** (0.195)
log.income ~ years of school	0.078*** (0.014)	0.089*** (0.012)	0.083*** (0.014)	0.070*** (0.014)
log.income ~ male	0.437*** (0.046)	0.427*** (0.045)	0.435*** (0.046)	0.447*** (0.045)
log.income ~ age	-0.022** (0.011)	-0.022* (0.011)	-0.022* (0.011)	-0.023** (0.011)
log.income ~ migrant	0.027 (0.155)	0.055 (0.152)	0.051 (0.152)	0.036 (0.152)
log.income ~ sum child.	0.024 (0.120)	0.034 (0.118)	0.029 (0.120)	0.029 (0.117)
log.income ~ sum adults	0.044 (0.109)	0.037 (0.107)	0.042 (0.107)	0.044 (0.107)
log.income ~ work. hours	0.012*** (0.003)	0.012*** (0.003)	0.012*** (0.003)	0.012*** (0.003)
log.income ~ LS:retired	0.333** (0.154)	0.320** (0.152)	0.321** (0.153)	0.325** (0.151)
log.income ~ LS:unemployed	-0.428*** (0.145)	-0.444*** (0.142)	-0.441*** (0.143)	-0.435*** (0.140)
log.income ~ LS:inactive	-4.682*** (0.607)	-4.688*** (0.608)	-4.691*** (0.609)	-4.688*** (0.608)
log.income ~ log. resid income	-0.034** (0.015)	-0.033** (0.015)	-0.034** (0.015)	-0.034** (0.015)
log.income ~ inherited	0.154* (0.088)	0.173** (0.087)	0.173** (0.087)	0.157* (0.086)
log.income ~ renting	-0.009 (0.093)	-0.005 (0.094)	-0.013 (0.093)	-0.018 (0.091)
netwealth (ihs) ~ CC	0.171 (0.312)	0.376 (0.287)	0.613** (0.275)	1.302* (0.727)
netwealth (ihs) ~ log.income	0.358*** (0.085)	0.357*** (0.085)	0.354*** (0.085)	0.352*** (0.086)
netwealth (ihs) ~ years of school.	0.236*** (0.047)	0.229*** (0.045)	0.210*** (0.044)	0.186*** (0.055)
netwealth (ihs) ~ male	-0.474** (0.189)	-0.464** (0.188)	-0.442** (0.186)	-0.418** (0.188)
netwealth (ihs) ~ age	0.005 (0.025)	0.005 (0.025)	0.007 (0.025)	0.004 (0.025)
netwealth (ihs) ~ migrant	-1.598*** (0.606)	-1.581*** (0.598)	-1.596*** (0.596)	-1.631*** (0.603)
netwealth (ihs) ~ sum child.	0.204 (0.280)	0.213 (0.281)	0.178 (0.284)	0.193 (0.279)
netwealth (ihs) ~ sum adults	-0.546** (0.247)	-0.546** (0.245)	-0.520** (0.243)	-0.529** (0.244)
netwealth (ihs) ~ log. resid income	0.093** (0.040)	0.092** (0.040)	0.088** (0.040)	0.090** (0.040)
netwealth (ihs) ~ inherited	0.785*** (0.256)	0.758*** (0.256)	0.800*** (0.258)	0.752*** (0.260)
netwealth (ihs) ~ renting	-3.411*** (0.270)	-3.449*** (0.273)	-3.456*** (0.276)	-3.450*** (0.271)
indirect effect (IE)	0.814*** (0.159)	0.510*** (0.124)	0.486*** (0.117)	1.473*** (0.425)
direct effect (DE)	0.171 (0.312)	0.376 (0.287)	0.613** (0.275)	1.302* (0.727)
total effect (TE)	0.985*** (0.314)	0.886*** (0.275)	1.099*** (0.265)	2.775*** (0.600)
IE/TE	0.826*** (0.270)	0.575*** (0.212)	0.442*** (0.140)	0.531*** (0.189)
Num.Obs.	1730	1730	1730	1730
AIC	22,656.3	22,799.3	22,724.3	27,755.5
BIC	22,847.3	22,990.3	22,915.2	28,011.9

NW net wealth, EF education father, B ≥ 100 books, CA cultural activities

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

B. Robustness checks

Tables 10–17.

Table 10 Direct, indirect and total effects of mediation analysis: Institutionalized CC (≥ 35 and ≤ 70 years of age)

	(1) TEF	(2) EM	(3) TEM	(4) OGF
indirect effect (IE)	0.527*** (0.076)	0.527*** (0.078)	0.635*** (0.102)	0.307*** (0.074)
direct effect (DE)	0.295 (0.512)	0.210 (0.405)	-0.037 (0.797)	-0.080 (0.235)
total effect (TE)	0.822 (0.525)	0.737* (0.413)	0.597 (0.809)	0.227 (0.236)
IE/TE	0.642 (0.398)	0.715* (0.393)	1.063 (1.418)	1.353 (1.386)
Num.Obs.	3011	3011	3011	3011
AIC	28,388.4	28,378.9	28,422.6	40,163.4
BIC	28,598.7	28,589.3	28,633.0	40,373.8

NW net wealth, *TEF* tertiary education father, *EM* education mother, *TEM* tertiary education mother, *OGF* occupation grandfather

* $p < 0.1$, *** $p < 0.01$

Table 11 Direct, indirect and total effects of mediation analysis: Alternative number of books threshold (≥ 35 and ≤ 70 years of age)

	(1) over 50 B	(2) over 100 B	(3) over 200 B
indirect effect (IE)	0.506*** (0.086)	0.538*** (0.098)	0.601*** (0.120)
direct effect (DE)	-0.006 (0.246)	0.251 (0.273)	-0.100 (0.384)
total effect (TE)	0.500** (0.241)	0.789*** (0.281)	0.501 (0.384)
Num.Obs.	3011	3011	3011
AIC	39,911.3	39,978.3	40,104.2
BIC	40,121.7	40,188.7	40,314.6

B books

** $p < 0.05$, *** $p < 0.01$

Table 12 Direct, indirect and total effects of mediation analysis: Value inheritances (≥ 35 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.801*** (0.138)	0.532*** (0.098)	0.430*** (0.095)	1.823*** (0.490)
direct effect (DE)	-0.121 (0.352)	0.232 (0.274)	0.576** (0.251)	0.783 (0.883)
total effect (TE)	0.680** (0.340)	0.765*** (0.281)	1.006*** (0.241)	2.606*** (0.688)
IE/TE	1.178** (0.600)	0.696*** (0.256)	0.427*** (0.133)	0.700** (0.276)
Num.Obs.	3011	3011	3011	3011
AIC	39,704.5	39,974.4	39,904.0	49,810.3
BIC	39,914.8	40,184.8	40,114.3	50,092.8

NW net wealth, *EF* education father, *B* ≥ 100 books, *CA* cultural activities

** $p < 0.05$, *** $p < 0.01$

Table 13 Direct, indirect and total effects of mediation analysis: Inclusion of all CC indicators as controls (≥ 35 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA
indirect effect (IE)	0.230*** (0.064)	0.524*** (0.113)	0.268*** (0.069)
direct effect (DE)	0.143 (0.274)	-0.328 (0.352)	0.612** (0.254)
total effect (TE)	0.373 (0.285)	0.196 (0.354)	0.880*** (0.250)
IE/TE	0.617 (0.455)	2.677 (4.773)	0.305*** (0.112)
Num.Obs.	3011	3011	3011
AIC	39,479.3	39,479.3	39,479.3
BIC	39,725.7	39,725.7	39,725.7

NW net wealth, EF education father, B > 100 books, CA cultural activities, CC cultural capital

p < 0.05, *p < 0.01

Table 14 Direct, indirect and total effects of mediation analysis: Gross wealth (≥ 35 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	1.188*** (0.173)	0.832*** (0.128)	0.704*** (0.119)	2.711*** (0.600)
direct effect (DE)	0.277 (0.360)	0.440 (0.315)	0.693** (0.284)	1.752** (0.817)
total effect (TE)	1.465*** (0.308)	1.273*** (0.305)	1.397*** (0.266)	4.463*** (0.645)
IE/TE	0.811*** (0.212)	0.654*** (0.175)	0.504*** (0.124)	0.607*** (0.150)
Num.Obs.	3011	3011	3011	3011
AIC	40,954.7	41,224.2	41,155.3	51,058.5
BIC	41,165.0	41,434.5	41,365.7	51,340.9

GW gross wealth, EF education father, B \geq 100 books, CA cultural activities

p < 0.05, *p < 0.01

Table 15 Direct, indirect and total effects of mediation analysis: Alternative intra-household division of net wealth (≥ 35 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.840*** (0.140)	0.551*** (0.096)	0.452*** (0.095)	1.974*** (0.485)
direct effect (DE)	-0.226 (0.332)	0.223 (0.295)	0.473* (0.252)	0.461 (0.871)
total effect (TE)	0.614* (0.329)	0.774*** (0.300)	0.926*** (0.243)	2.435*** (0.684)
IE/TE	1.367* (0.725)	0.712** (0.277)	0.489*** (0.156)	0.811** (0.315)
Num.Obs.	3011	3011	3011	3011
AIC	39,474.7	39,745.4	39,677.3	49,581.7
BIC	39,685.1	39,955.8	39,887.6	49,864.2

GW gross wealth, EF education father, B \geq 100 books, CA cultural activities

*p < 0.1, **p < 0.05, ***p < 0.01

Table 16 Direct, indirect and total effects of mediation analysis: ≥ 35 and ≤ 45 years of age

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.816** (0.319)	0.526** (0.231)	0.369** (0.172)	2.445* (1.432)
direct effect (DE)	-0.157 (0.813)	0.256 (0.575)	0.652 (0.557)	0.336 (2.804)
total effect (TE)	0.660 (0.806)	0.783 (0.577)	1.021* (0.579)	2.781 (2.040)
IE/TE	1.237 (1.503)	0.672 (0.521)	0.362 (0.227)	0.879 (0.932)
Num.Obs.	811	811	811	811
AIC	10,488.4	10,597.3	10,600.3	13,619.2
BIC	10,652.9	10,761.7	10,764.7	13,840.1

NW net wealth, *EF* education father, *B* ≥ 100 books, *CA* cultural activities

* $p < 0.1$, ** $p < 0.05$

Table 17 Direct, indirect and total effects of mediation analysis: ≥ 55 and ≤ 70 years of age

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.700*** (0.171)	0.516*** (0.146)	0.460*** (0.126)	1.160*** (0.382)
direct effect (DE)	0.344 (0.354)	0.410 (0.314)	0.602* (0.328)	1.352** (0.684)
total effect (TE)	1.044*** (0.342)	0.925*** (0.311)	1.063*** (0.322)	2.512*** (0.598)
IE/TE	0.670*** (0.249)	0.557** (0.218)	0.433*** (0.163)	0.462** (0.180)
Num.Obs.	1361	1361	1361	1361
AIC	17,698.5	17,769.5	17,739.0	21,437.3
BIC	17,881.1	17,952.0	17,921.5	21,682.5

NW net wealth, *EF* education father, *B* ≥ 100 books, *CA* cultural activities

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

C. Robustness checks by age group

Tables 18–29.

Table 18 Direct, indirect and total effects of mediation analysis: Institutionalized CC (≥ 35 and ≤ 50 years of age)

	(1) TEF	(2) EM	(3) TEM	(4) OGF
indirect effect (IE)	0.549*** (0.137)	0.533*** (0.121)	0.674*** (0.166)	0.263** (0.115)
direct effect (DE)	-0.311 (1.002)	-0.131 (0.723)	-0.377 (1.447)	-0.040 (0.411)
total effect (TE)	0.237 (1.042)	0.403 (0.750)	0.297 (1.489)	0.222 (0.423)
IE/TE	2.312 (9.961)	1.324 (2.394)	2.269 (11.208)	1.182 (2.182)
Num.Obs.	1281	1281	1281	1281
AIC	11,632.1	11,600.5	11,615.3	16,979.3
BIC	11,812.5	11,780.9	11,795.8	17,159.8

NW net wealth, *TEF* tertiary education father, *EM* education mother, *TEM* tertiary education mother, *OGF* occupation grandfather

** $p < 0.05$, *** $p < 0.01$

Table 19 Direct, indirect and total effects of mediation analysis: Institutionalized CC (≥51 and ≤70 years of age)

	(1) TEF	(2) EM	(3) TEM	(4) OGF
indirect effect (IE)	0.539*** (0.092)	0.527*** (0.095)	0.590*** (0.110)	0.323*** (0.085)
direct effect (DE)	0.845** (0.393)	0.474 (0.408)	0.320 (0.702)	-0.106 (0.297)
total effect (TE)	1.383*** (0.420)	1.001** (0.442)	0.910 (0.745)	0.217 (0.292)
IE/TE	0.389*** (0.111)	0.527** (0.208)	0.648 (0.488)	1.489 (2.010)
Num.Obs.	1730	1730	1730	1730
AIC	16,364.2	16,388.1	16,418.7	22,894.6
BIC	16,555.1	16,579.1	16,609.7	23,085.5

NW net wealth, TEF tertiary education father, EM education mother, TEM tertiary education mother, OGF occupation grandfather

p < 0.05, *p < 0.01

Table 20 Direct, indirect and total effects of mediation analysis: Alternative number of books threshold (≥35 and ≤50 years of age)

	(1) over 50 B	(2) over 100 B	(3) over 200 B
indirect effect (IE)	0.462*** (0.146)	0.564*** (0.179)	0.718*** (0.214)
direct effect (DE)	0.070 (0.394)	0.088 (0.460)	-0.786 (0.800)
total effect (TE)	0.532 (0.418)	0.651 (0.506)	-0.067 (0.848)
Num.Obs.	1281	1281	1281
AIC	16,871.6	16,882.4	16,927.0
BIC	17,052.0	17,062.8	17,107.5

B books

***p < 0.01

Table 21 Direct, indirect and total effects of mediation analysis: Alternative number of books threshold (≥51 and ≤70 years of age)

	(1) over 50 B	(2) over 100 B	(3) over 200 B
indirect effect (IE)	0.553*** (0.115)	0.510*** (0.124)	0.489*** (0.143)
direct effect (DE)	-0.169 (0.279)	0.376 (0.287)	0.373 (0.358)
total effect (TE)	0.384 (0.263)	0.886*** (0.275)	0.862** (0.345)
Num.Obs.	1730	1730	1730
AIC	22,743.4	22,799.3	22,882.5
BIC	22,934.3	22,990.3	23,073.4

B books

p < 0.05, *p < 0.01

Table 22 Direct, indirect and total effects of mediation analysis: Value inheritances (≥ 35 and ≤ 50 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.776*** (0.239)	0.560*** (0.179)	0.399*** (0.148)	2.609*** (0.987)
direct effect (DE)	-0.417 (0.596)	0.069 (0.459)	0.419 (0.439)	-0.473 (2.005)
total effect (TE)	0.359 (0.627)	0.629 (0.505)	0.818* (0.449)	2.136 (1.608)
IE/TE	2.162 (3.618)	0.890 (0.647)	0.487* (0.286)	1.222 (1.087)
Num.Obs.	1281	1281	1281	1281
AIC	16,752.1	16,881.0	16,885.1	21,605.6
BIC	16,932.5	17,061.4	17,065.6	21,847.9

NW net wealth, EF education father, B ≥ 100 books, CA cultural activities

* $p < 0.1$, *** $p < 0.01$

Table 23 Direct, indirect and total effects of mediation analysis: Value inheritances (≥ 51 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.805*** (0.158)	0.502*** (0.123)	0.478*** (0.117)	1.463*** (0.425)
direct effect (DE)	0.142 (0.313)	0.356 (0.290)	0.605** (0.274)	1.235* (0.725)
total effect (TE)	0.947*** (0.313)	0.858*** (0.278)	1.083*** (0.264)	2.698*** (0.596)
IE/TE	0.850*** (0.288)	0.585*** (0.223)	0.441*** (0.142)	0.542*** (0.196)
Num.Obs.	1730	1730	1730	1730
AIC	22,653.8	22,796.5	22,721.5	27,753.1
BIC	22,844.7	22,987.5	22,912.5	28,009.5

NW net wealth, EF education father, B ≥ 100 books, CA cultural activities

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 24 Direct, indirect and total effects of mediation analysis: Inclusion of all CC indicators as controls (≥ 35 and ≤ 50 years of age)

	(1) EF	(2) B	(3) CA
indirect effect (IE)	0.339*** (0.112)	0.520*** (0.199)	0.269*** (0.091)
direct effect (DE)	0.087 (0.447)	-0.545 (0.574)	0.493 (0.430)
total effect (TE)	0.426 (0.474)	-0.025 (0.596)	0.762* (0.433)
IE/TE	0.797 (0.832)	-20.626 (489.705)	0.353 (0.219)
Num.Obs.	1281	1281	1281
AIC	16,650.2	16,650.2	16,650.2
BIC	16,861.6	16,861.6	16,861.6

NW net wealth, EF education father, B ≥ 100 books, CA cultural activities, CC cultural capital

* $p < 0.1$, *** $p < 0.01$

Table 25 Direct, indirect and total effects of mediation analysis: Inclusion of all CC indicators as controls (≥ 51 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA
indirect effect (IE)	0.139* (0.083)	0.529*** (0.120)	0.293*** (0.089)
direct effect (DE)	0.184 (0.306)	-0.090 (0.345)	0.584** (0.283)
total effect (TE)	0.323 (0.311)	0.439 (0.361)	0.877*** (0.281)
IE/TE	0.429 (0.444)	1.206 (0.947)	0.334** (0.137)
Num.Obs.	1730	1730	1730
AIC	22,531.5	22,531.5	22,531.5
BIC	22,755.2	22,755.2	22,755.2

NW net wealth, EF education father, B ≥ 100 books, CA cultural activities, CC cultural capital

*p < 0.1, **p < 0.05, ***p < 0.01

Table 26 Direct, indirect and total effects of mediation analysis: Gross wealth (≥ 35 and ≤ 50 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	1.159*** (0.277)	0.958*** (0.196)	0.716*** (0.166)	3.816*** (1.114)
direct effect (DE)	0.255 (0.478)	0.086 (0.476)	0.291 (0.442)	0.620 (1.500)
total effect (TE)	1.414*** (0.444)	1.044** (0.502)	1.007** (0.440)	4.437*** (1.235)
IE/TE	0.820*** (0.293)	0.917** (0.420)	0.711** (0.325)	0.860*** (0.313)
Num.Obs.	1281	1281	1281	1281
AIC	16,885.8	17,014.1	17,019.3	21,738.6
BIC	17,066.2	17,194.5	17,199.7	21,980.9

GW gross wealth, EF education father, B ≥ 100 books, CA cultural activities

p < 0.05, *p < 0.01

Table 27 Direct, indirect and total effects of mediation analysis: Gross wealth (≥ 51 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	1.191*** (0.227)	0.704*** (0.185)	0.691*** (0.173)	2.005*** (0.608)
direct effect (DE)	0.294 (0.475)	0.782* (0.412)	1.027*** (0.373)	2.384** (1.094)
total effect (TE)	1.485*** (0.456)	1.486*** (0.380)	1.718*** (0.352)	4.389*** (0.915)
IE/TE	0.802*** (0.268)	0.474*** (0.168)	0.402*** (0.122)	0.457*** (0.167)
Num.Obs.	1730	1730	1730	1730
AIC	23,821.7	23,963.1	23,887.4	28,919.2
BIC	24,012.7	24,154.1	24,078.3	29,175.6

GW gross wealth, EF education father, B ≥ 100 books, CA cultural activities

*p < 0.1, **p < 0.05, ***p < 0.01

Table 28 Direct, indirect and total effects of mediation analysis: Alternative intra-household division of net wealth (≥ 35 and ≤ 50 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.793*** (0.242)	0.557*** (0.180)	0.394*** (0.151)	2.410** (1.014)
direct effect (DE)	-0.317 (0.619)	0.164 (0.496)	0.471 (0.437)	-0.021 (2.032)
total effect (TE)	0.475 (0.643)	0.721 (0.525)	0.865** (0.439)	2.390 (1.608)
IE/TE	1.668 (2.165)	0.773 (0.536)	0.455* (0.262)	1.009 (0.855)
Num.Obs.	1281	1281	1281	1281
AIC	16,680.7	16,809.1	16,812.9	21,534.0
BIC	16,861.2	16,989.6	16,993.3	21,776.3

GW gross wealth, EF education father, $B \geq 100$ books, CA cultural activities

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 29 Direct, indirect and total effects of mediation analysis: Alternative intra-household division of net wealth (≥ 51 and ≤ 70 years of age)

	(1) EF	(2) B	(3) CA	(4) EF,B,CA
indirect effect (IE)	0.868*** (0.157)	0.537*** (0.118)	0.525*** (0.112)	1.759*** (0.406)
direct effect (DE)	-0.149 (0.286)	0.263 (0.297)	0.351 (0.268)	0.464 (0.678)
total effect (TE)	0.719** (0.292)	0.800*** (0.282)	0.876*** (0.261)	2.223*** (0.566)
IE/TE	1.208** (0.472)	0.671** (0.268)	0.599*** (0.204)	0.791*** (0.264)
Num.Obs.	1730	1730	1730	1730
AIC	22,479.3	22,623.0	22,550.9	27,580.7
BIC	22,670.3	22,814.0	22,741.9	27,837.1

GW gross wealth, EF education father, $B \geq 100$ books, CA cultural activities

** $p < 0.05$, *** $p < 0.01$

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