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The Long Reach of Early-Life Values: Evidence on Life-Course Earnings*

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Abstract

Values formed in adolescence may have long-lasting consequences for people's economic lives. We examine this question using survey data collected in 1973 from 18–19-year-old Danes, linked to administrative earnings records covering the subsequent four decades. We find that adolescent value orientations strongly predict earnings across adulthood, with predictive power comparable to that of parental background and cognitive ability. Factor analysis identifies several underlying value orientations, of which 'conservatism'—capturing preferences for tradition, order and authority—shows a particularly strong association with lifetime earnings. A one-percentile increase in conservatism is associated with a decrease of more than 0.1 percentile in lifetime-earnings rank. These findings suggest that economic inequality and intergenerational mobility are shaped in part by values formed early in life.

Keywords: life values, lifetime income, economic inequality
JEL classification: J24, Z13, J31

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1. Introduction

What shapes individuals' lifetime earnings and, more broadly, economic inequality? Research on this central question in social science highlights the roles of cognitive ability, education, and socioeconomic background in shaping economic well-being (Hanushek and Woessmann, 2008; Autor, 2014; Chetty et al., 2017, 2014; Heckman and Landersø, 2022; Landersø and Heckman, 2017). More recent evidence suggests that non-cognitive skills and personality traits, such as patience, self-esteem, and emotional stability, also play an important role (Heckman et al., 2006; Lindqvist and Vestman, 2011; Golsteyn et al., 2014; Falk et al., 2018; Epper et al., 2020). Building on this line of inquiry, we examine the role of life values, understood as broader value orientations that capture what individuals consider important or worthwhile in life (Schwartz, 1992). Values measured early in life may be associated with economic outcomes over the life course through individuals' goals and decisions. For example, differences in orientations toward tradition, freedom, security, or achievement may be reflected in educational choices, career paths, and labour supply.

We ask whether life values in adolescence predict earnings over the life course, and which values are most strongly associated with later earnings.

Addressing these questions is challenging because it requires information on both individuals' life values and their earnings over the life course. We do so by combining a historical survey—the 1973 Danish Longitudinal Survey of Youth (DLSY), collected in late adolescence—with administrative earnings records spanning nearly the full working lives of respondents. The survey includes a rich set of questions on attitudes, beliefs and self-assessments, which we use to infer latent life values using factor analysis.

The combination of data and the long span make it possible to examine the association between life values and full earnings trajectories while taking into account cognitive ability, parental socioeconomic status (SES), neighbourhood, and other background characteristics. Because values were

measured before the earnings outcomes, subsequent earnings cannot have influenced the survey responses. Administrative earnings records also avoid recall and reporting errors associated with self-reported income.

We find that adolescent life values are strongly associated with earnings throughout adulthood. In our full specification, a one-percentile higher rank in the composite life-values index is associated with a 0.150-percentile higher rank in total earnings between ages 25 and 65. This association is precisely estimated (SE=0.020) and is similar in magnitude to that of cognitive ability (0.137) and higher than that of parental SES (0.095). Among the three value orientations identified in the survey, conservatism—capturing preferences for tradition, order, and authority—has the strongest association with earnings: a one-percentile higher rank in conservatism is associated with a 0.111-percentile lower rank in life-course earnings after accounting for the other values and observed background characteristics. Finally, a mediation analysis suggests that differences in educational attainment account for about one-third of the observed association between the composite life-values index and earnings.

The paper contributes to research on non-cognitive determinants of economic outcomes in three ways. First, it examines broad value orientations measured in late adolescence, extending the focus beyond individual personality traits and economic preferences. Second, linking these early measures to administrative earnings records over four decades allows us to document how their associations with earnings evolve throughout nearly the entire working life. Third, we compare the association of life values with life-course earnings to those of cognitive ability and parental background on a common rank scale and identify the value orientations underlying the overall relationship. The next section discusses these contributions in relation to existing research. Section 3 describes the data and measurement of life values, and Section 4 presents the empirical analyses and results. Section 5 presents robustness checks and discusses the results, and Section 6 concludes.

2. Relationship to Literature

This paper builds on research showing that characteristics beyond cognitive ability and family background predict economic outcomes. Studies in economics have examined non-cognitive skills, personality traits, and economic preferences, including self-esteem, locus of control, conscientiousness, and patience (Heckman et al., 2006; Drago, 2011; Gensowski, 2018; Falk et al., 2018; Epper et al., 2020). These constructs are related, but they do not exhaust the ways in which young people differ in their orientations toward work and society. We focus on life values: the beliefs and priorities that individuals express about what matters in life. Some of our measures overlap with established constructs, particularly the self-esteem factor, while others capture views about social order and gender roles that are less directly represented by conventional personality measures.

Our approach also relates to the long tradition of studying values in the social sciences (Inglehart, 1971; Rokeach, 1973; Schwartz, 1992). Schwartz's theory, for example, describes broad dimensions of values that guide motivation and behaviour (Schwartz, 1992; Schwartz et al., 2012). The questions in the 1973 Danish Longitudinal Survey of Youth were not designed to implement a particular theory of values. We therefore use factor analysis to summarise patterns across a broad set of responses rather than treating the resulting factors as direct measures of an established value taxonomy. This allows us to examine whether orientations expressed in late adolescence are associated with economic outcomes much later in life.

The closest studies in terms of data design link psychological assessments conducted during military enlistment with administrative earnings records. Using Swedish and Finnish data, they find that non-cognitive characteristics predict later earnings alongside cognitive ability (Lindqvist and Vestman, 2011; Jokela et al., 2017; Izadi and Tuhkuri, 2024). These assessments were conducted among young men and primarily measure traits relevant to performance in the military setting. Our study extends this research in two

ways: we measure a wider range of attitudes, beliefs, and self-assessments among women and men in late adolescence, and we link their responses to administrative earnings records covering nearly their entire working lives. We compare our estimates with those from the military-enlistment studies in Section 5.

Another study uses essays written by British children at 11 years of age to measure conformity to gender norms and finds that greater conformity among girls predicts lower lifetime earnings (Ayyar et al., 2024). It is particularly close to our analysis of gender traditionalism in examining the economic relevance of socially shaped beliefs. Our survey contains multiple value domains, allowing us to assess gender traditionalism alongside conservatism and self-esteem and to compare their associations with earnings over time.

Taken together, these literatures motivate three features of our contribution. We measure a broad set of adolescent orientations rather than a single trait or preference; we trace their relationship with earnings throughout adulthood; and we compare their predictive power with that of cognitive ability and parental socioeconomic background on a common rank scale. This combination shows where life values fit among established predictors of economic outcomes and which dimensions of survey responses account for the overall association.

3. Data and Measurement

This section describes the survey and administrative records, the analysis sample, and how we construct measures of adolescent life values from the survey responses.

3.1. Data

We use the Danish Longitudinal Study of Youth (DLSY), linked to administrative earnings records through individual identification numbers. The DLSY began with pupils in a nationally representative sample of 152 seventh-grade classes, covering approximately 4% of all such classes and 3,151 young

people born in or around 1954 (Jæger, 2015). The respondents and their parents were first interviewed in 1968, when the respondents were about 14 years old. Our measures of life values come from face-to-face interviews in 1973, when they were about 18–19 years old. Of the 2,731 respondents who can be linked to the administrative data, 2,390 have complete information for the survey questions, cognitive tests, and parental-background measures used in the analysis.

The 1973 survey contains 175 questions. Of these, we use the 78 that concern attitudes, beliefs, preferences, or self-assessments as potential indicators of life values. Factual questions, such as those about current school attendance, are excluded. The questions cover views on social order, interpersonal relations, gender roles, work aspirations, and self-evaluation. Appendix A.1 lists the survey items. Cognitive ability is measured using verbal, spatial, and inductive-reasoning tests administered in 1968. Parental socioeconomic background is measured using both parents' educational attainment and the primary earner's income when the respondent was 14. Further details on the cognitive tests appear in Appendix A.2.

Our outcome is total earnings between the ages 25 and 65, computed from annual administrative records made available through Statistics Denmark. We also examine earnings at individual ages to trace associations over the working life. These records are based on employer reports to the Danish Tax Agency and avoid recall and rounding errors associated with self-reported earnings (Kleven et al., 2011; Kreiner et al., 2014; Haaland et al., 2023).

3.2. Measuring Life Values

We treat the 78 survey items as noisy indicators of a smaller number of latent value orientations. Following Heckman et al. (2013), we use exploratory factor analysis to identify these latent factors from patterns of correlation across the survey items. A scree test initially suggests five candidate factors. After an oblique factor rotation, we retain the *dedicated survey items* for each factor, i.e., items that load strongly on one factor and weakly on the

others. Two of the five factors have only two dedicated items each, which is insufficient to estimate their scores using our procedure. We therefore retain the remaining three factors.

Understanding what the three retained factors represent requires interpretation, as does assigning them descriptive labels. To limit narrative bias and make this step transparent, we use a standard language model (ChatGPT) to suggest short labels and descriptions. The prompt supplies the dedicated survey items and their factor loadings, including the direction of each loading. Neither the factor analysis nor the labelling step uses respondents' earnings, so the factors and their labels are determined without outcome information. The only role of the language model is to provide labels and descriptions. The item groupings and loadings are reported in Appendix A.4, and the prompt and resulting descriptions are documented in Appendix A.5. This process yields the following factor labels and interpretations:

Factor 1 - Conservatism: This factor reflects traditional and conservative values, with a high score indicating a preference for societal norms, discipline, respect for authority, and a belief in hierarchy and order.

Factor 2 - Gender Traditionalism: This factor reflects traditional gender role beliefs, indicating that individuals scoring high strongly endorse traditional distinctions in gender responsibilities and roles in society, prioritizing men's involvement in public and political life while endorsing domestic and limited educational roles for women.

Factor 3 - Self-Esteem: This factor captures respondents' personal self-evaluation and feelings of self-worth. Higher factor scores suggest a positive self-image and higher personal confidence, while lower scores indicate lower self-esteem, feelings of inadequacy, and self-doubt.

The labels summarise the patterns across the survey responses rather than any single belief. Since the factors are not directly observed, we estimate a score for each respondent for each of the three factors using the questions

assigned to it. Questions receive greater weight when they have stronger factor loadings relative to measurement error. These scores can be examined individually, as we do in Section 4.2, or combined into an overall life-values index, as we do in Section 4.1. Appendix A.3 provides details on the factor analysis and score calculation.

4. Empirical Analysis and Results

4.1. Association between Life Values in Adolescence and Earnings over the Life Course

We begin by comparing the predictive power of life values, cognitive ability, and parental socioeconomic background. Each concept is inherently multidimensional, comprising distinct underlying factors – e.g., cognitive ability encompasses verbal, spatial, and inductive reasoning – which we seek to combine into a single composite index. A challenge is that there is no obvious way to combine these distinct factors into an economically meaningful index. To address this, we follow the earnings-anchoring approach of Nielsen (2019) and Cunha et al. (2021). Specifically, we regress total life-course earnings on the underlying factors of each concept and the other covariates in the corresponding specification. We then use the estimated coefficients on those factors as weights in a composite index. Factors associated with higher earnings receive positive weights, while those associated with lower earnings receive negative weights. We apply this procedure separately to life values, cognitive ability, and parental SES. A higher index value therefore denotes a combination of factors associated with higher earnings in the sample. We transform all three indices and life-course earnings into percentile ranks and estimate the association between their ranks. Ranking puts the indices on the same scale, allowing us to compare the strength of their associations with earnings. Appendix A.6 describes the formal construction of the indices.

Figure 1 shows bivariate relationships between the individual's percentile rank position in the earnings distribution and the rank of life values, cogni-

tive ability and parental SES. The figure shows that a one-percentile difference across individuals in the life value index is associated with about 0.2-percentile difference in their earnings. This association is roughly constant over the ages 35-60, i.e., throughout most of the working life. The association between life values and earnings is similar to the association between cognitive ability and earnings, and is uniformly greater than the association between parental SES and earnings from age 35.

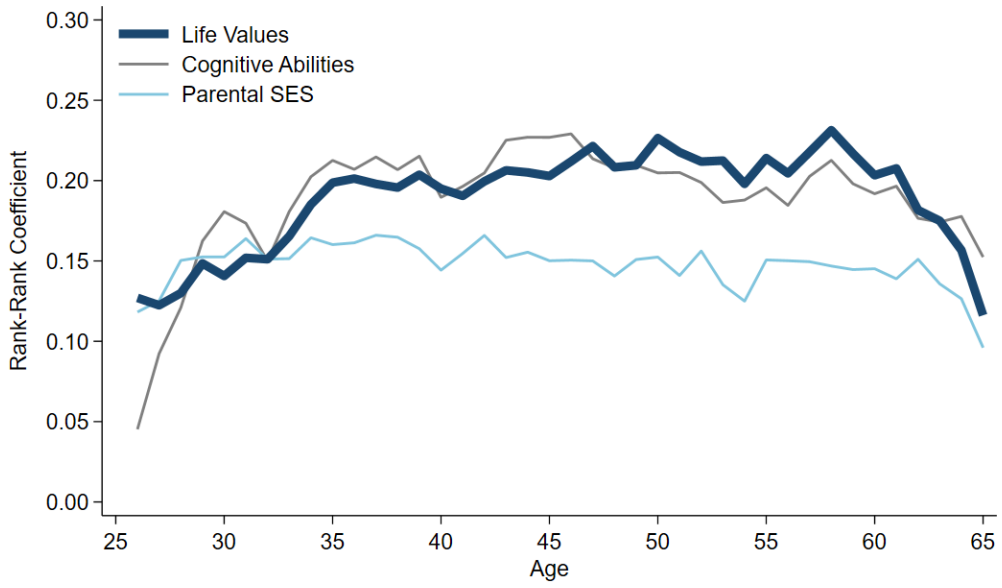


Figure 1: **Life Values, Cognitive Ability, Parental SES and Life Course Earnings.**

Notes: The figures shows the bivariate relationship between earnings rank and the rank of life values, cognitive ability and parental SES by age. The sample size is 2390.

Table 1 presents estimates from rank-rank regressions of total earnings over the life course, defined as the sum of earnings over the age range 25-65. Column (1) displays the result from a bivariate regression of total earnings on life values. The estimated rank-rank coefficient is 0.243 and is precisely estimated with SE=0.020, giving a 95%-confidence interval of 0.204-0.282. The estimate implies that a one-percentile difference in life values is associated

with a 0.243-percentile difference in earnings and that the difference between most and least favourable life values spans a difference of 24.3 percentiles in earnings. The rank-rank association is somewhat larger than the average level in Figure 1, reflecting that the sum of earnings reduces the importance of temporary earnings variation that reduces age-specific rank-rank associations. To get a sense of the variation in earnings across the percentiles in life values, we note that the top 1% with the most favourable life values earn 35% more than the average earnings level, while individuals in the bottom percentile earn 34% less than the average earnings level.

Column (2) includes the positions of the individual in the cognitive ability distribution and in the parental SES distribution, thus controlling for the correlation with these characteristics. The effect of life values remains quantitatively important with an estimate of 0.165, similar to the correlation with cognitive ability at 0.169, and greater than the correlation with parental SES at 0.106. Column (3) includes school fixed effects. School fixed effects control for any factor that is related to the geographical location of the school that the respondent attended, including the socio-economic composition of peers. This addition to the regression does not affect the estimated association between life values and earnings. Column (4) further includes year by month of birth fixed effects, as previous research has shown that the timing of birth within the year can matter for earnings (Angrist and Krueger, 1991). Adding these fixed effects does not significantly change the estimate of life values on earnings. In column (5), we add a dummy for the sex of the respondent. We also control for the number of siblings and for birth order within the sibling group, i.e., dummies for being first-born, second-born, and so on. The estimate of life values remains practically unaffected.

Finally, in column (6), we control for time preferences. Previous research has documented a relationship between time preferences measured during adolescence and long-term economic outcomes (Golsteyn et al., 2014; Epper et al., 2020). Our survey data includes responses to a question about the

preference for three different life-cycle paths of earnings that differ by when earnings are received. The exact wording is presented in Appendix A.1. The survey measure has previously been validated against experimentally elicited time discounting and is predictive of income (Epper et al., 2020). When we add this among the controls in column (6), it does not change the association between life values and earnings.

Table 1: Regression Analysis of Life Course Earnings on Life Values, Cognitive Ability and Parental SES

	(1)	(2)	(3)	(4)	(5)	(6)
Life Values	0.243***	0.165***	0.157***	0.158***	0.149***	0.150***
	(0.020)	(0.021)	(0.021)	(0.020)	(0.020)	(0.020)
Cognitive		0.169***	0.171***	0.159***	0.144***	0.137***
		(0.020)	(0.022)	(0.022)	(0.021)	(0.021)
Parental SES		0.106***	0.090***	0.094***	0.096***	0.095***
		(0.022)	(0.024)	(0.024)	(0.023)	(0.023)
School FE			X	X	X	X
Year×Month of Birth				X	X	X
Gender + Siblings					X	X
Time Preferences						X
Adj. R^2	0.058	0.090	0.105	0.114	0.148	0.150
Observations	2390	2390	2390	2390	2390	2390

Notes: The table shows regressions of the percentile rank position in the distribution of total life-course earnings on the rank positions of life values, cognitive abilities, and parental SES. Total earnings is the sum of earnings over the age range 25-65. Bootstrapped standard errors clustered at the school level are shown in parentheses. Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In summary, the overall rank-rank association between life course earnings and life values is strongly significant, stable over 40 years, and at least as important as cognitive ability and parental SES in predicting life course earnings.

4.2. Types of Life Values That Matter Most

We next examine the associations of the three life-value factor scores with earnings at individual ages and over the full earnings period. We estimate these associations separately and jointly, adding demographic characteristics, cognitive ability, parental background, and time preferences across specifications. This helps us understand which dimensions underlie the overall association between life values and earnings and how each dimension's association with earnings changes over the working life.

Figure 2 shows the bivariate associations between how people rank according to each factor and their rank in the earnings distribution throughout life. All three factors are individually predictive of earnings. Conservativeness is negatively associated with earnings, which becomes more pronounced as respondents age. By the mid-20s, the association with earnings is low, but by age 35 it is the most important factor, and it remains so throughout working life. After age 60, the association weakens as respondents begin to retire. During the age range 35-60, being one percentile higher in the distribution of conservativeness among the respondents is associated with being 0.15-0.20 percentiles lower in the earnings distribution. Similarly, gender traditionalism, which is related to conservatism, is also negatively associated with earnings and broadly follows the same trajectory as conservatism, albeit at a slightly lower level. Self-esteem follows a different trajectory over the life course. It appears to be the most important factor early in the work life, but its association with earnings peters out as working life progresses.

Table 2 shows the estimates from rank-rank regressions with total life-course earnings. Columns (1)-(3) show the bivariate regression estimates of life-course earnings on each of the three life value factors. Consistent with the pattern documented in Figure 2, a one-percentile increase in conservativeness, gender traditionalism, and self-esteem is associated with a -0.209, -0.158 and 0.116 percentile change in total earnings. In column (4), all three factors are included simultaneously. This leaves the effect of conservativeness largely

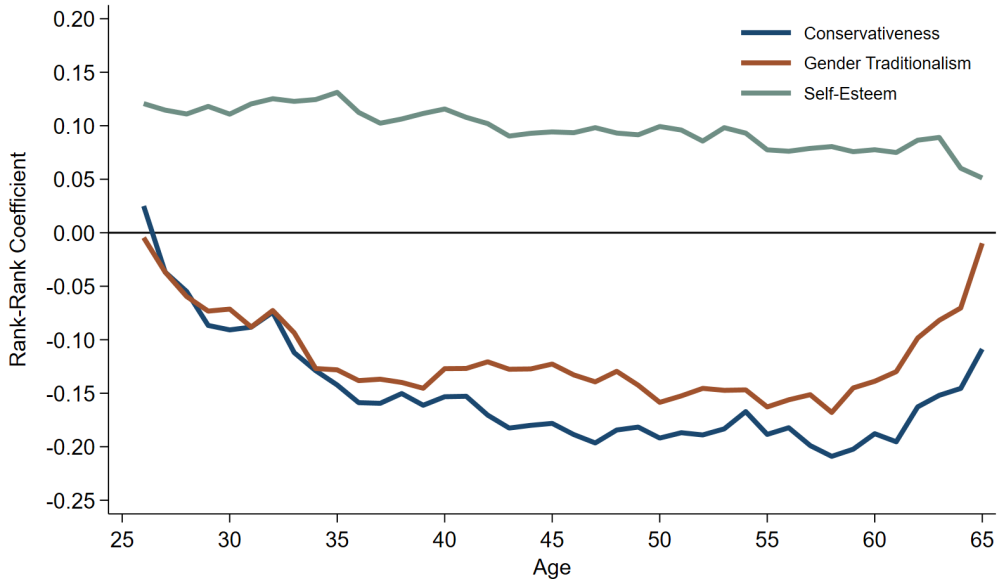


Figure 2: **Importance of Different Life Values for Earnings over The Life Course.**

Notes: The figure shows the bivariate rank-rank association between earnings and the three life value factors by age. The sample size is 2390.

unchanged while the effect of gender traditionalism is reduced to -0.055, reflecting that gender traditionalism is related to conservativeness in general. The estimated effect on self-esteem is largely unaffected by the inclusion of the other factors, reflecting that it captures other aspects. In columns (5)-(7), we add the same controls as in Table 1. Including all controls in column (7), the effect of conservatism is statistically significant at -0.111, while the association with gender traditionalism is insignificant at -0.034, and the association with self-esteem is significant at 0.076.

4.3. Education as a Mediator

Education is a well-established determinant of earnings over the life course. We therefore examine whether, and to what extent, the association between life values and life-course earnings can operate through educational attainment. This is assessed using mediation analysis, which decomposes the total

Table 2: Regression Analysis of Life Course Earnings on Life Value Factors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Conservativeness	-0.209***			-0.189***	-0.160***	-0.108***	-0.111***
	(0.021)			(0.026)	(0.025)	(0.026)	(0.026)
Gender Traditionalism		-0.158***		-0.055*	-0.053*	-0.034	-0.034
		(0.020)		(0.024)	(0.024)	(0.025)	(0.025)
Self-Esteem			0.116***	0.116***	0.076***	0.078***	0.076***
			(0.020)	(0.021)	(0.022)	(0.021)	(0.021)
Demographics					X	X	X
Cognitive Ability						X	X
Parental SES						X	X
Time Preferences							X
Adj. R^2	0.043	0.021	0.013	0.059	0.126	0.145	0.147
Observations	2390	2390	2390	2390	2390	2390	2390

Notes: The table shows regressions of the percentile rank position in the distribution of total life-course earnings on the rank positions of different life values. Total earnings is the sum of earnings over the age range 25-65. Bootstrapped standard errors clustered at school level are shown in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

association into a component operating through education and a residual component operating through other channels orthogonal to education. The method is described in detail in Appendix A.7.

We first assess the role of education as a mediator in the overall link between life values and life-course earnings. We measure education as years of completed education. Figure 3 presents the result. The overall rank-rank association between life values and life-course earnings is 0.150, conditional on the other factors and control variables, corresponding to the estimate in column (6) of Table 1. Figure 3 shows that the effect operating through education is significant and accounts for 0.054 of the rank-rank association. Hence, about one-third of the association between life values and earnings can be attributed to variation in education. Figure 3 also shows how education mediates the effect of cognitive ability and parental SES. For cognitive ability the total effect is 0.137 and also in this case the mediation effect of education

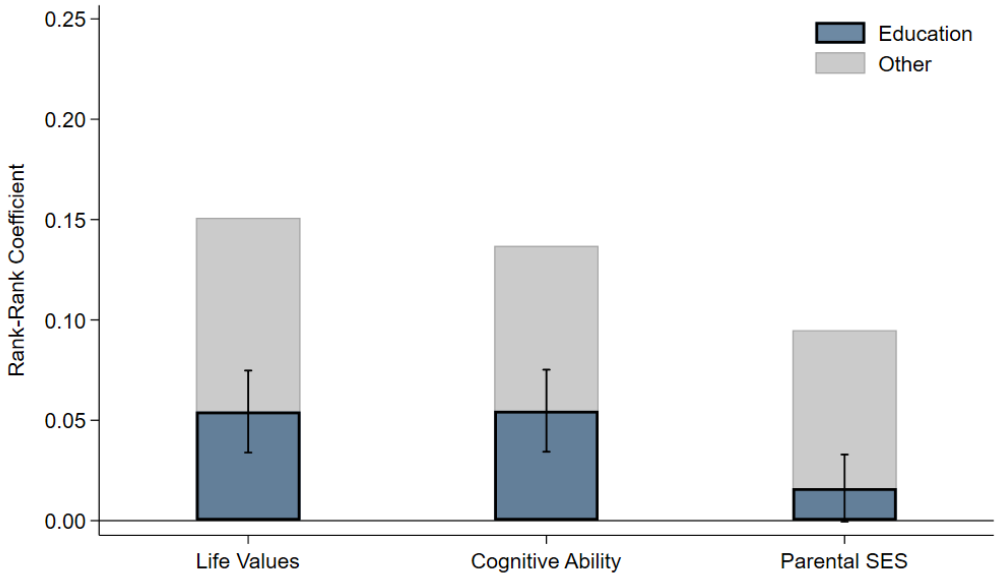


Figure 3: **Education and the Overall Association between Life Values, Cognitive Ability, Parental SES and Life Course Earnings**

Notes: The figure shows the coefficient decomposition described in Appendix A.7. The total bar height shows the overall rank-rank association of life values, cognitive ability or parental SES with life-course earnings. Dark colors show the portion accounted for by education, and light colors show the remaining association. Vertical error bars indicate 95% confidence intervals for the portion accounted for by education. All regressions include the full set of control variables included in column (6) of Table 1. Appendix A.8 reports the underlying estimates. The sample size is 2390.

is about one-third. For parental SES, the total effect is 0.095, with less than one-fifth accounted for by education.

Figure 4 shows the corresponding results for the individual life-value factors. The overall associations match column (7) of Table 2. A one-percentile higher rank in conservatism is associated with a 0.111-percentile lower rank in life-course earnings. The portion accounted for by education is -0.037, roughly one-third of the overall association. For gender traditionalism, about half of the estimated association is accounted for by education, although the overall association is not statistically significant. For self-esteem, the overall

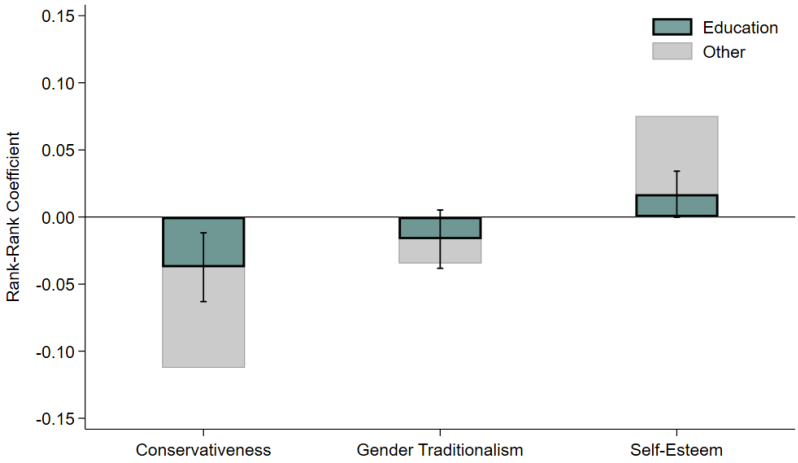


Figure 4: **Overall Importance of Life Value Factors for Earnings over The Life Course.**

Notes: The figure shows the coefficient decomposition described in Appendix A.7. The total bar height shows the overall rank-rank association between each life-value factor and life-course earnings. Dark colors show the portion accounted for by education, and light colors show the remaining association. Vertical error bars indicate 95% confidence intervals for the portion accounted for by education. All regressions include the full set of control variables included in column (7) of Table 2. Appendix A.8 reports the underlying estimates. The sample size is 2390.

association is 0.076, with little accounted for by education.

Taken together, these results suggest that educational attainment accounts for a substantial part of the association between adolescent life values and life-course earnings, particularly for conservatism. However, most of the overall association remains after accounting for education. This is especially true for self-esteem, suggesting that the relationship between early-life values and subsequent earnings is not explained by educational attainment alone.

5. Robustness and Discussion of Results

The analysis in Section 4 studies the sum of annual earnings over the working life. While this is a simple and transparent measure, it implicitly assumes that income received early and late in life is equally valuable, which

may not reflect individual consumption possibilities or preferences. To assess the robustness of our results to this assumption, we re-estimate Tables 1 and 2 using an alternative measure of life-course earnings computed as the sum of the present discounted values of annual earnings, discounted using a real interest rate of 2% and annual inflation rates. The results, reported in Appendix Tables A.5 and A.7, are very similar to those based on the sum of undiscounted earnings.

Our findings relate to studies that link military enlistment test data to administrative earnings records (Lindqvist and Vestman, 2011; Jokela et al., 2017; Izadi and Tuhkuri, 2024). Military enlistment tests often include a psychological assessment to gauge a recruit's ability to cope with the demands of military life, including stress, hierarchy, and discipline, and for screening for mental health problems. These studies analyze Swedish and Finnish enlistment data, and share a common methodology with our research: they utilize early measures of cognitive and non-cognitive skills alongside administrative data to track long-term earnings outcomes. These studies highlight that traits such as conscientiousness, extraversion, and emotional stability independently predict subsequent earnings, even after controlling for cognitive ability. Lindqvist and Vestman (2011) measures the association between non-cognitive skills and earnings in 2006 for the 1965–1974 male birth cohorts in Sweden and finds that an increase in non-cognitive ability by one standard deviation is associated with a wage increase of 6.6 log points. Using Finnish enlistment data, Izadi and Tuhkuri (2024) finds a 9.4 log point increase in earnings at age 36–39 per standard deviation change in non-cognitive skills. For comparison, in supplementary analyses, we adopt a similar log-specification and find that an increase in life values by one standard deviation is associated with a wage increase of 17.8 log points (see Appendix Table A.6). More comparable to the rank-rank correlations in our main results are the findings in Jokela et al. (2017), which uses Finnish enlistment data and estimates unconditional rank–rank correlations of 0.10 to

0.20 between personality test scores in a military setting and earnings at age 30.

Although some of the latent factors we extract—such as self-esteem—overlap conceptually with personality traits studied in psychology, our focus on life values reflects a broader set of beliefs and orientations that can guide long-term decision-making. Life values such as conservatism or gender traditionalism are not directly captured by personality taxonomies, such as the Big Five, which primarily focuses on behavioural tendencies like conscientiousness or openness to experience. Rather than measuring how individuals behave, our measures capture what individuals consider important—their ideals, principles, and views on social structure. Therefore, we treat life values as a related but broader construct that can overlap with personality traits and preferences, while capturing additional dimensions of the orientations of individuals: they are potentially shaped by culture, upbringing, or ideology and can reflect social or normative commitments rather than dispositional traits. However, they may still be correlated in practice—for example, individuals high in conscientiousness may also score higher on conservative life values—but we cannot disentangle this in our data.

Overall, our study complements existing research on the role of non-cognitive factors in shaping economic outcomes by demonstrating that adolescent life values—comprehensive, early-formed orientations about what individuals consider important—are strong predictors of earnings across the entire working life. Even after conditioning on cognitive ability, parental socio-economic status, and time preferences, we find that life values have enduring explanatory power, with conservative life values in particular associated with significantly lower lifetime earnings. Although we do not directly observe the mechanisms at play, the evidence suggests that life values are associated with outcomes through multiple channels, including education.

These findings highlight that the seeds of inequality are sown early, not only through family background or cognitive skills, but also through the

internalized values young people carry into adulthood. If life values shape ambition, openness to new roles, or social conformity, they may represent an overlooked driver of persistent inequality. Recognizing this adds a new layer to ongoing debates about equality of opportunity and raises the possibility that early-life interventions targeting value formation could improve long-term economic outcomes. Future research should explore the extent to which life values are malleable during adolescence. Recent experimental evidence suggests that economic preferences can be shaped during this period Alan and Ertac (2018).

While our analysis is based on a Danish cohort born in the mid-1950s, we believe the core insights about life values are broadly relevant. The predictive power of adolescent values for adult outcomes may even be stronger today, given increasing labour-market dynamism and the premium on adaptability. Still, institutional settings differ, and value structures evolve over time. Future research should examine whether similar patterns hold in younger cohorts and in countries with different cultural and economic environments.

6. Concluding Remarks

Using a survey of Danish adolescents linked to administrative earnings records over four decades, we find that early-life values predict earnings throughout adulthood. The association of the composite life-values index with life-course earnings is similar in magnitude to that of cognitive ability and exceeds that of parental socioeconomic background on a common rank scale. Among the individual value factors, conservatism has the strongest conditional association with earnings. Educational attainment accounts for about one-third of the overall association between life values and earnings.

The paper adds broad value orientations measured before labour-market entry to the set of early characteristics used to understand long-run earnings differences. Their predictive power across much of working life suggests that studying how young people form views about work and society can deepen

our understanding of economic inequality.

Data and Code Availability

The micro data set used in the paper combines survey and register data merged together by Statistics Denmark using social security numbers. Data and programs used for the analysis are securely stored at Statistics Denmark with Project No. 708522. The project received approval from the Danish Data Protection Agency (Agreement 514-0210/21-2000) and Statistics Denmark. The use and storage of individual-level data adhere to the European Union's General Data Protection Regulation. Further, due to privacy rules, the data may not be transferred to computers outside Statistics Denmark. Researchers seeking access to this data must apply through Statistics Denmark, either as affiliated with a Danish institution approved by Statistics Denmark or in collaboration with researchers affiliated with such Danish institutions. Furthermore, access to the DLSY requires approval by Rigsarkivet (The Danish National Archive). The code will be made publicly available.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this manuscript, ChatGPT was used to assist with drafting and revising parts of the text. In the empirical analysis, it was also used to suggest interpretations and labels for factors identified through factor analysis. This use is described in greater detail in the manuscript. The authors reviewed and edited the AI-assisted material and take full responsibility for the content of the manuscript.

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A. Supplementary Material

A.1. Questions in DLSY

DLSY survey questions used for assessing life values are listed Panel A in Table A.1. The survey items used for assessing cognitive ability and parental background are listed in Panel B and C, respectively, while survey items used in the set of controls are listed in Panel D.

Table A.1: DLSY Survey Items Used in the Analysis

Question (Item)	**Response Categories**
Panel A: Life Value Indicators (all measured in DLSY-1973)	
H32: In the past seven years of school was compulsory. This is now extended to 9 years. How many years of compulsory school do you think we should have?	1 "7 years" 2 "8 years" 3 "9 years" 4 "10 years" 5 "11 years" 6 "12 years"
Listed below are statements concerning different aspects of a job which many people think are important. *When you think of your future job, how would you rate each of the following aspects:*	
H55: High salary	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H56: Meet people all the time	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H57: Job takes place in a clean environment	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H58: Work independently	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H59: Job is prestigious	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"

Table A.1 – continued

Question (Item)	Response Categories
H60: Job involves influence and power	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H61: You get to do something for others	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H62: Travel the world and see things	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H63: Get to create something	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H64: Feel secure financially	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H65: Short working hours	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H66: Work is interesting	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H67: Working outdoors most of the time	1 "Not important at all" 2 "Not important" 3 "Important" 4 "Very important"
H72: If you were free to choose, would you prefer to live at home with your parents for the next 3-4 years?	1 "No" 2 "Yes"
H73: Would you mind being financially dependent on your parents for the next 3-4 years?	1 "No" 2 "Would dislike a little" 3 "Would dislike it a lot"
H74: If you were free to choose, would you prefer to be a full-time housewife/husband for the next 3-4 years?	1 "No" 2 "Yes"
Listed below are descriptions of what parents are like. Please state to which extent you think these descriptions are true:	

Table A.1 – continued

Question (Item)	Response Categories
H99: Parents are like this: Young people and parents are usually able to get along and talk things through, thus avoiding quarrel	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H100: Parent should not interfere with how young people do their job	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H101: Parents usually think it's annoying when young people ask too many questions	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H102: Most parents take an interest in young people's friends	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H103: Parents have to spend af lot of time teaching young people how to behave	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H104: If they can parents should give young people advice regarding their work	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H105: Parents usually think that young people should obey parents without asking questions	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H106: At home young people can hardly ever do what they want to do because parents watch television every night	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H107: It would be strange if parents never slapped their children	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H108: Parents usually demand that young people help out around the house. If children have extra time they can pursue their own interests	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H109: Parents should allow for young people to have time to pursue their interests	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"

Table A.1 – continued

Question (Item)	Response Categories
Listed below are statements that many people either agree or disagree with. Please state your opinion:	
H110: It would better for all if people talked less and worked more	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H111: Children who talk back at their parents may end up respecting parents more in the long run	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H112: It would never occur to a healthy, normal, and decent person to hurt a close friend or relative	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H113: Discipline, a firm hand and the will to work and fight for family and country should be more important	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H114: Most of our social problems would be solved if we could somehow get rid of the immoral and dishonest people	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H116: A person with bad manners and habits should not expect to get along with decent people	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H117: Nobody has ever learned anything important except through suffering	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H118: People should embrace new ideas even if they challenge our usual way of life	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H119: People can be divided in two classes: the weak and the strong	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H120: Radio and television uses too many naughty words	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H121: When you have a problem, you should think things through instead of trying to forget your problem by being preoccupied with more positive things	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"

Table A.1 – continued

Question (Item)	Response Categories
H122: Defamation is not always as important as we think and it not worth worrying about	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H123: Young people get rebellious ideas from time to time but should put these ideas aside when they get older	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H124: People tend to put too much weight on respect and authority	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H125: In the future, scientific results might show that many of the things we believe to be true are wrong	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H126: What this country needs more than legislation and politics are a few brave, tireless, and self-sacrificing leaders whom the people can trust	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H127: Sex offenders who commit crimes such as rape and child molestation should be punished more than just by prison. These criminals should be flogged in public or something even worse	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
Listed below are questions on different issues which we would like your opinion on:	
H128: Boys are better than girls at technical subjects and math	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H129: People expect girls to be more hard-working and diligent than boys	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H130: Women are better than men at nursing the sick	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H131: A man's work is always more valuable than a woman's	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"

Table A.1 – continued

Question (Item)	Response Categories
H132: Women need not be as interested in politics as men	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H133: In many families the father makes practically all decisions	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H134: Women who take an interest in politics are strange	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H135: A father is more entitled to more leisure time than a mother	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H136: Most girls really prefer to get married and to be housewives	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H137: A girl does not need as much education as a boy since she is only going to have a job until she gets married	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H138: Do you think that two young people having a child should get married?	1 "No" 2 "Yes"
H139: Are you looking forward to getting older?	1 "Very much" 2 "A little" 3 "Not at all"
H140: Do you consider yourself a young person or a grown-up?	1 "Young person" 2 "Grown-up"
Rosenberg Self-Esteem Items. Now we would like to ask you some questions about yourself. Please state how well each description matches you:	
H142: On the whole I am satisfied with myself	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H143: I certainly feel useless at times	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"

Table A.1 – continued

Question (Item)	Response Categories
H144: I feel that I have a number of good qualities	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H145: I am able to do things as well as most other people	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H146: I feel I do not have much to be proud of	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H147: At times I think I am not good at all	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H148: I feel that I am a person of worth, at least on an equal plane with others	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H149: I wish I could have more respect for myself	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H150: All in all, I am inclined to feel that I am a failure	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H151: Which of the following statements comes closest to how you see yourself?	1 "I wish was different" 2 "I would like to change many things" 3 "I like the way I am"
Listed below are again some statements about different issues. Please state your opinion:	
H152: Society is fine as it is	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H153: In Denmark all people are equal	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"

Table A.1 – continued

Question (Item)	Response Categories
H154: One should not take part in a demonstration	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H155: Politicians do their best to attend to the people's interests	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H156: In this country, if you are in need you can always get help and support somewhere	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H157: If you need money there is always a friend who will help you	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H158: Everybody wants to watch but nobody wants to help when an accident occurs	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H159: The ordinary worker does not have enough influence on the job	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H160: We do not provide sufficient help to developing countries	1 "Disagree strongly" 2 "Disagree" 3 "Agree" 4 "Agree strongly"
H161: What do you think about different wages for different types of work?	1 "Differences should be bigger" 2 "Differences are ok as they are" 3 "Differences are too big"
H162: How interested are you in politics?	1 Not interested at all" 2 "A little interested" 3 "Somewhat interested" 4 "Very interested"
Panel B: Indicators for assessing cognitive ability (all measured in DLSY-1968)	
Verbal test	"Number of correct answers in verbal test"
Spatial test	"Number of correct answers in spatial test"

Table A.1 – continued

Question (Item)	Response Categories
Inductive test	"Number of correct answers in inductive test"
Panel C: Indicators for assessing parental background	
Taxable annual income in thousands of kr. for main provider - average for 1967 and 1968	*Note*: The main provider and the parent who has answered the parental survey is not necessarily the same person
Father's vocational education	1 "No education" 2 "Practical training, no formal education" 3 "Short vocational education" 4 "Vocational education" 5 "Higher education (not university)" 6"University"
Mother's vocational education	1 "No education" 2 "Practical training, no formal education" 3 "Short vocational education" 4 "Vocational education" 5 "Higher education (not university)" 6"University"

Notes: Questions are answered by one parent in the 1968 and 1969 waves. Respondents are linked to their parents using the Danish Multi-Generation Register (lite version), which also provides the birth year of both parents. Parental education is measured primarily using administrative education records; if this information is missing, it is supplemented with corresponding survey responses in 1969-wave.

Panel D: Items used in set of control variables (all measured in DLSY-1968, except H39)	
School number in 1968	Select school among the 152 interviewed school classes
Sex	1 "Male" 2 "Female"
Month of birth	
Year of birth	
How many siblings do you have?	Number of siblings
How many older siblings do you have?	Number of older siblings

Table A.1 – continued

Question (Item)	Response Categories
Proxy for time preferences (measured in DLSY-1973):	
H39: If given the offer between the three following jobs, which one would you choose?	1 "Average salary from the start" 2 "Low salary first 2 years then higher" 3 "Very low salary 4 years then very high"

Notes: Sex, birth date, and information on siblings is primarily measured using administrative records; if this information is missing, it is supplemented with corresponding survey responses

A.2. Cognitive Tests

The cognitive measures were collected in 1968. The verbal-reasoning test had 63 questions, covering opposites, similarities, analogies, arithmetic problems, number sequences, and word order, with a 20-minute time limit. The spatial-reasoning test had 40 problems involving two- and three-dimensional figures and a 15-minute limit. The inductive-reasoning test had 40 number-sequence problems and an 18-minute limit. Scores count correct answers. Ørum (1971) provides further information on the tests.

A.3. Factor Analysis and Score Construction

Life values are not directly observed but must be inferred from adolescents' responses to numerous survey questions. We assume that these responses reflect a smaller number of underlying life-value factors, which we seek to identify using factor analysis. Following Heckman et al. (2013) and the broader psychometric literature (see Gorsuch, 2003; Thompson, 2004), this approach exploits correlations across survey items to identify common latent factors and estimate individual factor scores while accounting for measurement error. Although factor analysis is data-driven and objective in principle, it still requires methodological judgement at several stages. To ensure

transparency in these decisions, we follow the two-step procedure of Heckman et al. (2013): first, we use Exploratory Factor Analysis (EFA) to identify interpretable factors by forming clusters of interrelated survey items; second, we estimate individual factor scores while accounting for measurement error.

A.3.1. Exploratory Factor Analysis

Following the standard factor analysis model (e.g., Harman, 1976), we assume that responses to the K survey items reflect J underlying life-value factors. Specifically, we model the K-dimensional vector of survey responses $\boldsymbol{M}$ as

$$\boldsymbol{M} = \boldsymbol{\nu} + \boldsymbol{\varphi}\boldsymbol{\theta} + \boldsymbol{\eta}, \tag{1}$$

where $\boldsymbol{\theta}$ is a J-dimensional vector of latent life-value factors, $\boldsymbol{\varphi}$ is a $K \times J$ matrix of factor loadings capturing how strongly each survey item relates to the underlying factors, $\boldsymbol{\nu}$ contains item-specific intercepts, and $\boldsymbol{\eta}$ represents measurement errors. Since neither the observed survey measures nor the latent factors have a natural scale or location, we normalise both to have zero mean and unit variance. We further assume that measurement errors have mean zero and are independent across measures and of the latent factors.

Under these assumptions, the covariance matrix of the observed measures, $\boldsymbol{\Sigma_M}$, can be expressed as

$$\boldsymbol{\Sigma_M} = \boldsymbol{\varphi}\boldsymbol{\Sigma_\theta}\boldsymbol{\varphi'} + \boldsymbol{\Sigma_\eta}, \tag{2}$$

where $\boldsymbol{\Sigma_\theta}$ is the covariance matrix of the latent factors and $\boldsymbol{\Sigma_\eta}$ is a diagonal matrix of measurement error variances. This decomposition captures the central idea of factor analysis: correlations across survey items arise from their dependence on common underlying factors, while the remaining variation is specific to each item.

The goal of exploratory factor analysis is to estimate the factor loadings $\boldsymbol{\varphi}$ and factor correlations $\boldsymbol{\Sigma_\theta}$ for a given number of latent factors. A key challenge, however, is that the model is *rotationally indeterminate*: different

combinations of factor loadings and factor correlations can generate the same covariance structure of the observed measures. Exploratory factor analysis addresses this identification problem by a two-stage approach. First, *factor extraction* allows us to determine the number of latent factors to retain by providing initial estimates of the parameters of the factor model. Second, *factor rotation* transforms these initial parameter estimates to obtain factors that are more readily interpretable.

Factor Extraction: To determine the number of latent factors, we follow Heckman et al. (2013) and apply the scree test (Cattell, 1966). Specifically, we estimate factor models with different numbers of factors using iterative principal factor analysis and examine the eigenvalues of the estimated common covariance matrix $\boldsymbol{\varphi}\boldsymbol{\Sigma}_{\boldsymbol{\theta}}\boldsymbol{\varphi}'$.[2] The scree test identifies the point at which the eigenvalues begin to level off, indicating that additional factors explain relatively little variation in the measures. In our data, the scree plot (Figure A.2) suggests retaining five factors.

Factor Rotation: Because the EFA model is rotationally indeterminate, different combinations of factor loadings and factor correlations can reproduce the same covariance structure. We therefore rotate the initial five-factor solution to obtain more interpretable factors without changing the explained covariance $\boldsymbol{\varphi}\boldsymbol{\Sigma}_{\boldsymbol{\theta}}\boldsymbol{\varphi}'$. Specifically, we seek a structure in which each factor is defined by a distinct set of *dedicated measures*, i.e., survey items that load strongly on one factor but weakly on the others. The idea is that measures within each set reflect the same underlying life value.

There are several different rotation methods. We employ a *direct quar-*

[2]IPF provides initial estimates of $\boldsymbol{\varphi}$ and $\boldsymbol{\Sigma}_{\boldsymbol{\theta}}$ under identifying constraints, including that the extracted factors are uncorrelated. The subsequent oblique rotation allows factors to be correlated. We prefer IPF to maximum likelihood (ML) extraction because it does not require the observed measures to follow a multivariate normal distribution (Fabrigar et al., 1999).

timin oblique rotation, which allows the latent factors to be correlated, as is appropriate for conceptually related life values (Heckman et al., 2013). Appendix Table A.8 reports the rotated factor loadings. Following recommended practice (Costello and Osborne, 2005; Yong et al., 2013), we classify a measure as dedicated to a factor if it has a high absolute loading (≥ 0.32) on that factor and low absolute cross-loadings (< 0.32) on all others. Measures with uniformly weak loadings or substantial cross-loadings are excluded from further analysis. The dedicated measures are highlighted in bold in Appendix Table A.8. Factors 4 and 5 each have only two dedicated measures. As discussed in the next subsection, factor scores cannot be identified for factors defined by fewer than three items. Moreover, as noted by Costello and Osborne (2005), such factors tend to be weak, unstable, and difficult to interpret. We therefore exclude Factors 4 and 5 and retain the first three factors for further analysis. The survey items associated with the retained factors are summarised in Table A.2.

A.3.2. Computing Scores of Latent Factors

The EFA procedure identifies three latent life-value factors, each associated with a distinct set of dedicated survey measures. We now use these measures to estimate an individual score for each factor. Specifically, we assume that each dedicated measure depends only on its assigned latent factor, such that

$$M_{i,q}^{j} = \lambda_{q}^{j}\theta_{i}^{j} + \varepsilon_{i,q}^{j} \tag{3}$$

where $M_{i,q}^{j}$ denotes individual i's response to the qth survey item dedicated to factor j, while θ_{i}^{j} is the individual's latent value of this factor, λ_{q}^{j} is the corresponding factor loading, and $\varepsilon_{i,q}^{j}$ is the measurement error. With factors normalised to unit variance and measurement errors uncorrelated across measures and with the factors, the covariance between two distinct dedicated

measures of factor j is

$$\text{Cov}(M^j_{i,q}, M^j_{i,q^*}) = \lambda^j_q \lambda^j_{q^*} \tag{4}$$

while the variance of each measure is

$$\text{Var}(M^j_{i,q}) = (\lambda^j_q)^2 + \text{Var}(\varepsilon^j_{i,q}) \tag{5}$$

If a factor has at least three dedicated measures, all loadings λ^j_q and measurement error variances $\text{Var}(\varepsilon^j_{i,q})$ are identifiable by equations (4) and (5). We estimate these parameters by maximum likelihood using confirmatory factor analysis (CFA). The estimated factor loadings are reported in the second column of Table A.2.

We then construct individual factor scores using the Bartlett score method (Heckman et al., 2013). This method estimates each individual's latent factor by weighted least squares (WLS) based on equation (3), weighting each measure by the inverse of its measurement error variance. The resulting factor score is

$$\widehat{\theta}^j_i = (\widehat{\boldsymbol{\lambda}}'_j \widehat{\boldsymbol{\Omega}}_j^{-1} \widehat{\boldsymbol{\lambda}}_j)^{-1} \widehat{\boldsymbol{\lambda}}'_j \widehat{\boldsymbol{\Omega}}_j^{-1} \boldsymbol{M}^j_i \tag{6}$$

where $\boldsymbol{M}^j_i$ is the vector of dedicated measures for factor j, $\widehat{\boldsymbol{\lambda}}_j$ contains their estimated factor loadings, and $\widehat{\boldsymbol{\Omega}}_j$ is a diagonal matrix of estimated measurement error variances. The Bartlett score for each factor is thus a weighted average of its dedicated measures, assigning greater weight to measures with stronger factor loadings relative to their measurement error.

A.4. Life Value Questions by Groups Identified in Factor Analysis

The grouping of questions resulting from the factor analysis are listed in Table A.2. The first column lists the dedicated survey items for each of the retained factors, and the second column reports the estimated factor loadings.

Table A.2: Factors Identified by EFA and their Dedicated Measures

Item	Loading
Conservativeness	
Most of our social problems would be solved if we could somehow get rid of the immoral and dishonest people	0.623
Sex offenders who commit crimes such as rape and child molestation should be punished more than just by prison. These criminals should be flogged in public or something worse	0.578
Discipline, a firm hand and the will to sacrifice work and fight for family and country should be more important	0.567
A person with bad manners and habits should not expect to get along with decent people	0.543
What this country needs more than legislation and politics are a few brave, tireless, and self-sacrificing leaders whom the people can trust	0.535
One should not take part in a demonstration	0.515
Parents have to spend a lot of time teaching young people how to behave	0.503
It would better for all if people talked less and worked more	0.492
Important in job: Job is prestigious	0.443
Has anybody ever learned anything important except through suffering	0.426
Interest in politics	-0.400
People can be divided in two classes: the weak and the strong	0.399
Young people get rebellious ideas from time to time but should put these ideas aside when they get older	0.385
Important in job: High salary	0.348

Table A.2 – continued

Item	Loading
Important in job: Feel secure financially	0.271
We do not provide sufficient help to developing countries	-0.264
Gender Traditionalism	
Women need not be as interested in politics as men	0.720
A man's work is always more valuable than a woman's	0.691
Women who take an interest in politics are strange	0.630
A girl does not need as much education as a boy since she is only going to have a job until she gets married	0.612
A father is more entitled to more leisure time than a mother	0.593
Self-Esteem	
At times I think I am not good at all	-0.602
All in all, I am inclined to feel that I am a failure	-0.564
I certainly feel useless at times	-0.550
I wish I could have more respect for myself	-0.498
I feel that I have a number of good qualities	0.432
Respondent's self-perception from "I wish I was different" to "I like the way I am"	0.429
I feel I do not have much to be proud of	-0.412
I feel that I am a person of worth, at least on an equal plane with others	0.398
On the whole I am satisfied with myself	0.381
I am able to do things as well as most other people	0.279

Table A.2 – continued

Item	Loading

Notes: The table reports the dedicated survey items for each of the three retained latent factors. The second column reports the estimated factor loadings from the estimation of the dedicated measurement system in the Confirmatory Factor Analysis. The exact formulation of questions and response categories for the survey items can be found in Table A.1.

A.5. ChatGPT Prompt for Labelling Factors

In order to label the factors resulting from the factor analysis, we supplied ChatGPT with the questions and factor loadings reported in Table A.2. Figure A.1 reproduces the prompt and the suggested labels and descriptions. We further provide the following public link for a copy of the conversation: `https://chatgpt.com/share/682c936e-397c-800f-bb5c-4118d80746ed`.

I have conducted an exploratory factor analysis on a long list of questions related to life values. Based on this a dedicated measurement system is established, where three blocks of questions are identified. I have attached a picture showing how questions are grouped in these three blocks. All questions within a block are assumed to be related to the same latent factor of life values. Can you please label each of the identified latent factors and describe in one or two sentences how to interpret the factor. The label should only consist of a single or two words and reflect some theoretical/interpretable type of life value. If you think that a factor does not have any theoretical meaning, please do not label the factor.
Note, that the first column of the screenshot shows the question/item description while the second column displays the estimated factor loading of each item. Items with a higher factor loading (in numerical terms) should be assigned a larger weight in your interpretation of the factors.
Note, further that items may both have positive and negative factor loadings. A positive factor loading indicates that respondents with a high score of this latent factor tend to agree with the statement/question, whereas a negative factor loading means that respondents with a high score of the factor tend to disagree strongly with the statement/question.
Your labels of factors should reflect the sign of the factor, such that the labels aligns with the direction of the factor score.

Here are suggested labels and interpretations for each factor based on the provided factor loadings:

Factor 1: **Conservatism**

This factor represents conservative life values emphasizing moral traditionalism, strict social order, strong discipline, respect for authority, and skepticism towards altruistic international policies. Individuals scoring high on this factor prefer clear moral boundaries and traditional societal norms.

Factor 2: **Gender Traditionalism**

This factor reflects traditional gender role beliefs, indicating that individuals scoring high strongly endorse traditional distinctions in gender responsibilities and roles in society, prioritizing men's involvement in public and political life while endorsing domestic and limited educational roles for women.

Factor 3: **Self-esteem**

This factor captures respondents' personal self-evaluation and feelings of self-worth. Higher factor scores suggest a positive self-image and higher personal confidence, while negative scores indicate lower self-esteem, feelings of inadequacy, and self-doubt.

Figure A.1: **Prompt and suggested labels for the life-value factors.**

A.6. Composite Index Construction

Life values, cognitive abilities, and parental SES are all multidimensional concepts comprising several underlying factors. Life values are measured through individuals' conservativeness, gender traditionalism, and self-esteem; cognitive abilities through verbal, spatial, and inductive reasoning; and parental SES through parental income and education. To estimate and compare the overall association of these concepts with life-course earnings, we summarise each concept by mapping its underlying factors into a single composite index. We then transform the resulting indices into percentile ranks, which places the three concepts on a common scale and allows direct comparison of their ability to predict life-course earnings.

A central challenge in constructing such indices is that concepts like life values lack a natural scale or ordering: there is no intrinsic sense in which one bundle of life-value factors should rank higher or lower than another. This raises two related conceptual issues. First, for the resulting rank indices to be meaningful, their underlying scale (the composite index) must reflect interpretable variation in the underlying factors. In other words, it should be well-defined what it means for an individual to receive a higher or lower rank of a given concept. Second, the relative importance of a given bundle of factors may depend on the context. For example, one bundle of life-value factors may be advantageous in an economic context but less so for social or psychological outcomes. As emphasized by Nielsen (2019), the mapping procedure should therefore be context specific: when the objective is to study the association between life values and life-course earnings, the composite index should assign greater weight to the most earnings-relevant dimensions of life values.

To address both challenges, we follow the anchoring approach of Nielsen (2019), as also discussed in Cunha et al. (2021). Consider a multidimensional concept (e.g., life values) represented by a vector of J_ψ underlying factors $\boldsymbol{\psi}_i = (\psi_{1,i}, \psi_{2,i}, \ldots, \psi_{J_\psi,i})'$ for each individual i. We construct the composite

index Ψ_i by anchoring $\boldsymbol{\psi}_i$ to the cardinal outcome, life-course earnings Y_i, such that

$$\Psi_i \equiv \mathbb{E}[Y_i \mid \boldsymbol{\psi}_i, \boldsymbol{X}_i = \bar{\boldsymbol{X}}], \tag{7}$$

where $\boldsymbol{X}_i$ is a vector of controls and $\bar{\boldsymbol{X}}$ their sample mean. This vector coincides with the set of controls included in the corresponding regression specifications in Table 1; for instance, in the bivariate specification (column 1) $\boldsymbol{X}_i$ is empty, whereas in the first multivariate specification (column 2) it includes the underlying factors of cognitive abilities and parental SES.

We estimate the composite index in (7) by OLS on the following linear model[3]

$$Y_i = \alpha + \boldsymbol{\psi}_i'\boldsymbol{\beta}_\psi + \boldsymbol{X}_i'\boldsymbol{\gamma} + u_i. \tag{8}$$

This procedure yields the estimated composite index

$$\hat{\Psi}_i = \mu + \boldsymbol{\psi}_i\hat{\boldsymbol{\beta}}_\psi \tag{9}$$

where $\mu = \hat{\alpha} + \bar{\boldsymbol{X}}'\hat{\boldsymbol{\gamma}}$ is a fixed location parameter. The index is thus a weighted sum of the underlying factors, where each factor $\psi_{j,i}$ is weighted by its conditional association with earnings. The estimated weights capture both strength and direction of association: negatively associated factors receive negative weights, and more predictive factors—whether positively or negatively—receive larger absolute weights. Furthermore, since the factors are anchored to a cardinal outcome, the composite index $\hat{\Psi}_i$ is also cardinal (Cunha et al., 2021). It thus summarises each concept on an interpretable scale that reflects how valuable individual i's bundle of underlying factors is in terms of predicted life-course earnings, holding $\boldsymbol{X}_i$ fixed at its mean. When transformed into percentile ranks, the resulting rank index orders individuals according to how economically favourable their bundle of factors

[3]We also estimate $\mathbb{E}[Y_i \mid \boldsymbol{\psi}_i]$ more flexibly allowing for two-way interactions and squared terms of $\boldsymbol{\psi}_i$, but the results are similar to the additive specification.

is.

Because this procedure is applied uniformly across life values, cognitive abilities, and parental SES, the resulting rank indices are directly comparable in both scale and interpretation. This allows us to regress the percentile rank of life-course earnings on the rank indices of each concept and obtain meaningful, directly comparable estimates of their overall associations with life-course earnings. Intuitively, the coefficient on the life-values index answers the question: if an individual moves up one percentile rank in life values—meaning their bundle of life values becomes relatively more favourable for future earnings— by how many percentile ranks does their position in the earnings distribution increase?

A.7. Education Decomposition

The education decomposition compares the coefficient on life values from a baseline regression with the corresponding coefficient after adding years of schooling:

$$Y_i = \beta_0 + \beta_1 Z_i + \boldsymbol{\gamma}' \boldsymbol{X}_i + u_i \tag{10}$$

$$Y_i = \tilde{\beta}_0 + \tilde{\beta}_1 Z_i + \tilde{\boldsymbol{\gamma}}' \boldsymbol{X}_i + \tilde{\delta} M_i + e_i, \tag{11}$$

where Y_i denotes earnings, Z_i is life values (measured either by the composite index or by an individual factor), $\boldsymbol{X}_i$ is a vector of covariates, and M_i is education, i.e. the mediator measured as years of schooling. Equation (10) corresponds to the full-control specification used to produce the estimates reported in column 6 of Table 1 for the composite measure and column 7 of Table 2 for the individual factors.

Under this decomposition, β_1 captures the total association between life values and lifetime earnings, while the difference between the two coefficients on life values, $\beta_1 - \tilde{\beta}_1$, is the portion of the total association that is accounted for by education. We obtain standard errors for $\beta_1 - \tilde{\beta}_1$ by bootstrapping.

A.8. Additional Material Relating to the Mediation Analysis

Table A.3: Education as a Mediator in the Overall Association between Life Values, Cognitive Ability, Parental SES and Life Course Earnings

	Total Effect	**via Education**
Rank Life Values	0.150***	0.054***
	(0.020)	(0.010)
Rank Cognitive	0.137***	0.055***
	(0.021)	(0.010)
Rank Parental SES	0.095***	0.012
	(0.023)	(0.009)
Observations	2390	2390

Bootstrapped standard errors clustered at school level
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.4: Education as a Mediator in the Association between Different Life Value Factors and Life Course Earnings

	Total Effect	**via Education**
Conservativeness	-0.111***	-0.037**
	(0.026)	(0.013)
Gender Traditionalism	-0.034	-0.016
	(0.025)	(0.011)
Self-Esteem	0.076***	0.017
	(0.021)	(0.009)
Observations	2390	2390

Bootstrapped standard errors clustered at school level
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.9. Robustness

Table A.5: Regression Analysis of Life Course Earnings on Life Values, Cognitive Ability and Parental SES: Role of Discounting

	(1)	(2)	(3)	(4)	(5)	(6)
Life Values	0.240***	0.149***	0.139***	0.142***	0.133***	0.133***
	(0.020)	(0.022)	(0.021)	(0.021)	(0.020)	(0.020)
Cognitive		0.157***	0.164***	0.157***	0.148***	0.141***
		(0.022)	(0.023)	(0.023)	(0.022)	(0.022)
Parental SES		0.115***	0.094***	0.089***	0.078***	0.079***
		(0.018)	(0.021)	(0.021)	(0.021)	(0.021)
School FE			X	X	X	X
Year×Month of Birth				X	X	X
Gender + Siblings					X	X
Time Preferences						X
Adj. R^2	0.057	0.092	0.108	0.112	0.168	0.171
Observations	2390	2390	2390	2390	2390	2390

Notes: The table shows regressions of the percentile rank position in the distribution of total life-course earnings on the rank positions of life values, cognitive abilities, and parents SES. We compute the present value of earnings using a real interest rate of 2% and adjust for inflation using Statistics Denmark's Consumer Price Index 2015 and then rank individuals based on this measure of life-course earnings. Bootstrapped standard errors clustered at school level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.6: Regression Analysis of Life Course Earnings on Life Values, Cognitive Ability and Parental SES: Log-Level Regression Specifications

	(1)	(2)	(3)	(4)	(5)	(6)
Life Values	0.237***	0.201***	0.189***	0.194***	0.181***	0.178***
	(0.039)	(0.038)	(0.035)	(0.035)	(0.035)	(0.034)
Cognitive		0.116*	0.130*	0.113*	0.113*	0.105*
		(0.045)	(0.051)	(0.051)	(0.050)	(0.050)
Parental SES		0.219***	0.209***	0.206***	0.204***	0.203***
		(0.054)	(0.059)	(0.060)	(0.060)	(0.059)
School FE			X	X	X	X
Year×Month of Birth				X	X	X
Gender + Siblings					X	X
Time Preferences						X
Adj. R^2	0.013	0.025	0.042	0.043	0.047	0.048
Observations	2390	2390	2390	2390	2390	2390

Notes: The table shows regressions of the logarithm of life course earnings on standardised variables of life values, cognitive abilities, and parents SES. Bootstrapped standard errors clustered at school level. The dependent variable is winsorized at P1/P99 .) * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.7: Regression Analysis of Life Course Earnings on Life Value Factors: Role of Discounting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Conservativeness	-0.201***			-0.180***	-0.152***	-0.098***	-0.101***
	(0.022)			(0.027)	(0.026)	(0.026)	(0.026)
Gender Traditionalism		-0.155***		-0.055*	-0.054*	-0.034	-0.034
		(0.021)		(0.025)	(0.024)	(0.025)	(0.024)
Self-Esteem			0.125***	0.126***	0.072***	0.074***	0.072***
			(0.020)	(0.021)	(0.021)	(0.021)	(0.021)
Demographics					X	X	X
Cognitive Ability						X	X
Parental SES						X	X
Time Preferences							X
Adj. R^2	0.040	0.020	0.015	0.058	0.149	0.169	0.172
Observations	2390	2390	2390	2390	2390	2390	2390

Notes: The table shows regressions of the percentile rank position in the distribution of total life-course earnings on the rank positions of different life values. We compute the present value of earnings using a real interest rate of 2% and adjust for inflation using Statistics Denmark's Consumer Price Index 2015 and then rank individuals based on this measure of life-course earnings. Bootstrapped standard errors clustered at school level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.10. Additional Material Relating to Factor Analysis and Regressions

A.10.1. Exploratory Factor Analysis

The scree plot for determining the optimal number of factors in the factor extraction stage of EFA is presented in Figure A.2.

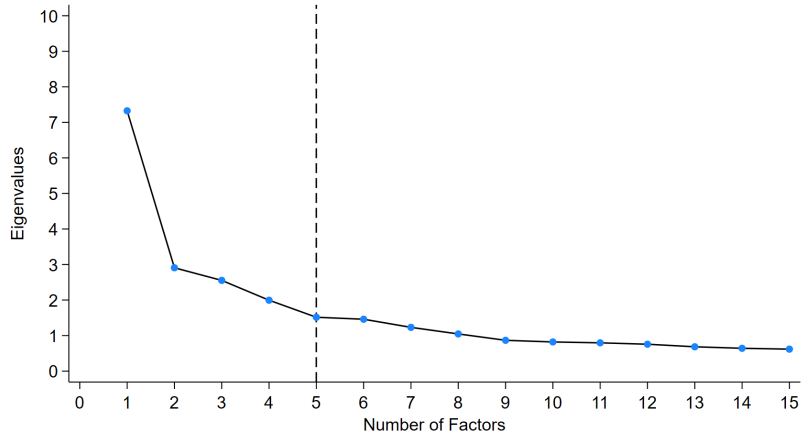


Figure A.2: **Scree Plot for Determining Number of Factors.** The figure plots the eigenvalues of different factor solutions. This plot suggests that the optimal choice of factors to extract is five, as the eigenvalues seem to level off after this factor number, reflecting that extracting additional factors after this point does not add much explained variation in measures.

The table of rotated factor loadings from an EFA for a five-factor solution is presented in Table A.8. Here, the factor loadings belonging to dedicated measures are highlighted in bold.

Table A.8: Rotated Factor loadings from EFA with Five Factors

	Factor1	Factor2	Factor3	Factor4	Factor5
H32	0.240	-0.051	-0.036	-0.152	-0.011
H55	**0.354**	0.023	0.087	0.047	-0.045

Table A.8 – continued

	Factor1	Factor2	Factor3	Factor4	Factor5
H56	-0.012	-0.036	-0.092	0.314	-0.035
H57	0.106	0.096	-0.097	0.244	-0.120
H58	0.016	-0.060	-0.003	0.303	-0.028
H59	**0.376**	0.162	0.018	0.262	-0.145
H60	0.237	0.285	0.047	0.257	-0.115
H61	-0.046	-0.106	-0.199	**0.446**	-0.084
H62	-0.028	0.071	-0.043	0.309	0.001
H63	-0.041	-0.088	0.028	**0.469**	0.052
H64	**0.393**	-0.145	0.054	0.219	-0.033
H65	0.166	0.017	0.013	0.117	0.089
H66	-0.004	-0.148	0.012	0.270	-0.026
H67	0.152	0.043	0.009	0.174	0.091
H72	-0.023	-0.098	-0.106	0.019	0.118
H73	-0.191	0.310	0.081	0.026	-0.148
H74	-0.095	0.048	0.071	0.014	-0.134
H99	0.132	0.047	0.068	0.147	-0.221
H100	0.037	-0.002	0.015	-0.027	0.201
H101	0.157	0.196	0.007	-0.112	**0.338**
H102	0.044	-0.110	0.004	0.182	-0.190
H103	**0.335**	0.083	-0.007	0.064	0.112
H104	0.149	-0.125	0.049	0.151	0.036
H105	0.128	0.170	0.011	-0.093	0.310
H106	0.097	0.137	-0.063	-0.051	**0.430**
H107	0.305	0.131	-0.020	-0.056	0.166
H108	0.131	0.221	-0.034	-0.067	0.315
H109	-0.096	-0.040	0.082	0.249	0.106
H110	**0.383**	0.161	-0.015	-0.003	-0.017

Table A.8 – continued

	Factor1	Factor2	Factor3	Factor4	Factor5
H111	0.088	-0.035	0.007	0.147	0.131
H112	0.256	0.008	0.107	0.084	0.017
H113	**0.463**	0.224	-0.040	0.012	-0.015
H114	**0.631**	-0.029	0.009	-0.007	0.069
H116	**0.443**	0.068	0.054	0.038	0.089
H117	**0.338**	0.165	-0.122	0.019	0.134
H118	-0.055	-0.192	0.024	0.245	0.251
H119	**0.372**	0.071	0.027	0.032	0.235
H120	0.259	0.278	-0.144	0.044	-0.082
H121	0.066	-0.061	-0.002	0.098	0.130
H122	-0.070	-0.070	0.006	0.087	0.194
H123	**0.688**	-0.031	0.024	-0.040	-0.063
H124	0.019	-0.081	0.000	0.188	0.316
H125	-0.000	-0.142	0.028	0.176	0.229
H126	**0.461**	-0.121	0.001	0.039	0.146
H127	**0.553**	0.027	0.056	-0.070	-0.017
H128	0.057	0.304	-0.100	0.045	-0.058
H129	-0.017	0.170	-0.096	0.106	0.167
H130	0.312	0.290	0.067	-0.024	0.010
H131	0.008	**0.663**	-0.019	-0.017	-0.002
H132	0.092	**0.605**	-0.054	-0.047	-0.012
H133	-0.098	0.235	0.045	-0.002	0.318
H134	-0.005	**0.590**	-0.049	0.011	0.048
H135	-0.069	**0.582**	0.011	-0.009	0.058
H136	0.248	0.279	0.002	-0.049	0.095
H137	0.043	**0.560**	0.059	-0.069	0.100
H138	-0.098	-0.209	-0.031	-0.008	0.143

Table A.8 – continued

	Factor1	Factor2	Factor3	Factor4	Factor5
H139	-0.058	0.155	0.040	0.095	0.007
H140	0.032	-0.068	-0.112	-0.067	-0.079
H142	0.133	0.209	**0.458**	0.108	0.048
H143	-0.044	-0.047	**-0.521**	0.135	0.049
H144	-0.066	0.124	**0.419**	0.264	0.091
H145	-0.046	0.021	**0.337**	0.232	0.145
H146	-0.014	0.135	**-0.374**	-0.046	0.070
H147	-0.091	0.042	**-0.541**	0.103	0.075
H148	-0.049	-0.072	**0.370**	0.197	0.154
H149	0.123	0.070	**-0.501**	0.109	0.025
H150	0.074	0.160	**-0.529**	0.019	0.026
H151	-0.055	-0.065	**-0.424**	0.025	0.061
H152	0.084	0.307	0.113	0.015	-0.226
H153	0.155	0.221	0.112	-0.042	-0.249
H154	**0.353**	0.235	-0.063	-0.106	-0.160
H155	0.042	0.175	0.108	0.094	-0.199
H156	0.210	0.051	0.134	0.068	-0.162
H157	0.175	0.020	0.063	0.146	-0.061
H158	0.114	-0.001	-0.024	0.026	0.248
H159	-0.109	-0.050	-0.093	0.126	0.309
H160	**-0.366**	0.160	-0.117	0.178	0.092
H161	0.089	0.181	0.047	0.047	-0.212
H162	**-0.356**	-0.068	0.075	0.189	0.077

Table A.8 – continued

	Factor1	Factor2	Factor3	Factor4	Factor5

Notes: The table reports estimates of factor loadings of a five-factor solution after a *direct quartimin oblique* rotation. The index column denotes the variable label. The specific question for each variable label can be found in Table A.1. Dedicated measures are highlighted in bold.

Table A.9: Factor Covariance Matrix

	Conservativeness	Gender Traditionalism	Self-Esteem
Conservativeness	1	0.592	-0.026
Gender Traditionalism	0.592	1	-0.087
Self-Esteem	-0.026	-0.087	1

Notes: The table shows the variance-covariance matrix of the three extracted factors.