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THE EFFECT OF TEENAGE EMPLOYMENT ON CHARACTER SKILLS, EXPECTATIONS AND OCCUPATIONAL CHOICE STRATEGIES

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The Effect of Teenage Employment on Character Skills, Expectations and Occupational Choice Strategies*

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Abstract: A growing body of research suggests that, even after controlling for cognitive abilities, personality predicts economic success in later life. The learning environment at school focuses on knowledge and cognitive skills. The transmission of character skills, however, is not at the center of attention. Leisure activities as informal learning activities outside of school may affect the formation of skills. By providing valuable opportunities, working part-time while attending full-time secondary schooling can be seen as a stepping stone toward independence and adulthood. The channel of the positive influence, however has not been identified empirically. I suggest that employment during adolescence promotes the formation of character skills that are known to have a positive effect on labor market outcomes and educational achievement. Employing a flexible strategy combining propensity score matching and regression techniques to account for self-selection, I find beneficial effects on character skills. Further, it improves future expectations, the knowledge on which skills and talents school students have and reduces the importance of parents' advice with respect to their child's future career. The results are robust to several model specifications and varying samples and robust to including family-fixed effects.

Keywords: human capital, teenage employment, non-cognitive skills, time use, treatment effect
JEL: I 21, J 13, J 24

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1 Introduction

For adolescents and young adults in Germany working part-time while attending full-time education is a common leisure activity. Between 2002 and 2010 the proportion of people who had a paid job during adolescence and young adulthood remained quite stable at around 33%.[1] In 2010 young people spent on average eight hours per week with activities related to their part-time job.[2] A frequently mentioned concern of working during adolescence is that working part-time after school may crowd out homework time and therefore may lead to worse grades and a lower educational attainment. On the other side, taking one's first real job is seen as a stepping stone toward independence and adulthood (Rauscher, Wegman, Wooding, Davis, & Junkin, 2013). Working part-time while in school may promote a sense of responsibility, confidence, and interpersonal skills at an early stage of life and therefore may lead to better labor market outcomes in adulthood.

Part of the existing literature confirms a positive relationship between high school employment and economic success in adulthood. Using different empirical strategies to take account of the endogeneity of high school employment, Ruhm (1997), Light (2001) and Hotz, Xu, Tienda, and Ahituv (2002) find positive and meaningful effects on earnings in later life. Using geographic characteristics such as the local unemployment rate and indicators for various geographic regions as instruments for the endogenous decision to work, Ruhm finds beneficial effects on earnings. For instance, working 20 hours per week during high school's senior year increases earnings by 22% and leads to a 9% higher hourly wage six to nine years later. Light finds similar results using various ability measures, family structure, and the existence of high school employment programs as instruments. Hotz et al. discuss the important role of how the dynamic form of selection is accounted in the model specification and confirm partially the positive relationship between high school employment and later earnings.

Another strand of literature documents a negative relationship between after-school employment and various measures of economic success. Using time-diary data of 15-18 year old high school students, Kalenkoski and Pabilonia (2012) find a substantial negative effect of teenage employment on the amount of time students spend on homework on school and non-school days. This is in line with the allocation of

[1] See Shell Jugendstudie in 2002, 2006, and 2010 for more detailed information.

[2] In 2010 the Shell Jugendstudie consists of secondary school students, apprentices, and college students aged between 12 and 25. While college students work 11 hours, trainees work 8.6 hours per week.

time model by Becker (1965) and the zero-sum model by Coleman (1961) in which a greater involvement in one activity reduces the amount of time people are able to spend on other activities. Distinguishing between working on school days and during summer vacation, Oettinger (1999) confirms a crowding out effect of teenage employment. While working during the preceding summer break does not have any effects on the grade point average (gpa), working on school days initially has a small positive effect on high school performance that becomes negative if the weekly working hours exceed a critical value. Lillydahl (1990), McNeal (1995), Ruhm (1997), and DeSimone (2006) support the inverted U-shaped relationship between work intensity and various measures of high school performance.

While the channel of the negative effect is conceptually straightforward, the channel of the positive effect of working a moderate amount of time during adolescence on educational attainment and earnings in adulthood is less clear. This article sheds more light on this topic by elaborating the influence of adolescent employment on character skills which are confirmed by the existing literature having a positive effect on educational attainment and various labor market outcomes. I assume that working a moderate amount of time during adolescence fosters a broad range of important skills such as responsibility, self-efficacy and good work ethic. Further, I assume that adolescent employment reduces the uncertainty about the world of work, helps adolescents to recognize their talents and interests, makes them more independent of their parents, and may signalize future employers their preference to work and their willingness to reduce their engagement in other leisure activities. As a last assumption, the reduction of the uncertainty about the world of work and the supportive nature of employment to recognize talents and interests may help to find a job in adult life that could be fulfilling.

Cunha, Heckman, Lochner, and Masterov (2006) and Cunha, Heckman, and Schennach (2010) present a multistage model of the evolution of cognitive and character skills of children with a focus on parental investments. Their findings suggest that especially for the formation of cognitive skills early investments made by parents matter and that an adverse endowment of cognitive abilities at an early stage of life cannot be easily compensated by later parents' investments. Del Boca, Monfardini, and Nicoletti (2012) confirm empirically this pattern for maternal investments. Using the amount of time mothers' spent actively with their children during childhood and adolescence as a proxy for maternal investments, they find that investments during childhood are more effective for the formation of children's cognitive abilities than during adolescence. In addition to maternal investments, they consider children's own investments measured by the amount of time invested in activities which

are assumed to be beneficial for the formation of cognitive abilities such as doing homework, reading, and performing arts or sports. While maternal investments become less relevant with increasing age of children, children's own investments grow in importance for the formation of cognitive skills. This pattern, however, can also be driven by character skills. Besides cognitive skills also non-cognitive abilities can be affected by leisure activities. Achievement test results used as measures of cognitive abilities do not only cover cognitive but also some character skills (Borghans, Duckworth, Heckman, & ter Weel, 2008 and Borghans, Goldsteyn, Heckman, & Meijers, 2009). Further, Cunha et al. (2006, 2010) find that the formation of character skills is more malleable and not entirely concluded by the time children enter adolescence than in comparison to cognitive skills.

The newer neuroscientific research shows that character skills are reflected in the brain's functional architecture and have therefore also a biological basis. Schmidtke and Heller (2004) document that neuroticism, a measure of emotional instability, is related with increasing activity in the right posterior hemisphere. DeYoung et al. (2010) examine the relationship between the Big Five personality traits, five dimensions used to describe human personality, and the volume of different brain regions. While agreeableness varies with the volume of brain regions that process information about the intention and mental states of other individuals, conscientiousness is related to the volume of regions which are involved in planning and the voluntary control of behavior. As mentioned in Blakemore and Choudhoury (2006), adolescence represents a period of synaptic reorganizations and is therefore a period in which the brain is more sensitive to input. Teenage employment, as an example of input that may affect the development of the brain could then, through this biological channel, influence the development of character skills.

A growing body of research suggests that character skills predict economic success in later life, even after controlling for cognitive abilities. Heckman and Rubinstein (2001) and Heckman, Humphries, and Kautz (2014) show that although high school dropouts who pass the GED are smarter than other dropouts and broadly as smart as high school graduates without any college experience, especially males do not experience any wage premium in comparison to dropouts.[3] Therefore, the GED can be interpreted as a signal of deficits in character skills that led them drop out of high school and lead to adverse labor market outcomes of male GED graduates.

In the Western world the employment of adolescents is legally regulated. In Ger-

[3]The GED (General Educational Development) is a battery of achievement tests for high school dropouts giving them the opportunity to earn a high school equivalency diploma.

many the legal situation to what extent school-aged children are allowed to work is governed by the Youth Employment Protection Act (Jugendarbeitsschutzgesetz, JArbSchG). In general, it is forbidden by law to employ school students younger than 13 years of age. From age 13 onwards, however, part-time employment is allowed subject to some restrictions depending on the type of occupation.

This paper makes use of two different data sets, the German Socio-Economic Panel (SOEP) provided by the DIW and the Time Budget Survey (TBS) provided by the Federal Statistical Office. SOEP is an annual household panel survey covering more than 11,000 households and is representative for Germany. It includes detailed information on family background, involvement in different leisure activities, school performance, future education and career plans as well as various measures of character skills. The TBS covers the years 2001/02 and has detailed information on time use measured in five and ten minute intervals, respectively. Additionally, it provides information on family background, which part-time job adolescents do and how much time per week they spend working. For the analysis both samples are restricted to youths who attended a secondary school in the year in which they completed the questionnaire.

Assuming that the acquisition of character skills is a cumulative process, depending on past and contemporaneous inputs as well as on the innate skill endowment, I use Todd and Wolpin's (2003) cumulative model specification. I employ a flexible strategy combining propensity score matching and regression techniques to account for self-selection into teenage employment.

My main findings are as follows. First, I find a positive selection into teenage employment. Adolescents who work part-time during full-time schooling have on average higher-educated parents and live in financially well-endowed households. Their parents were less non-employed and more likely to be self-employed in the past in comparison to parents of adolescents who never worked while attending school. Teenagers with a migration background or who live in regions with high unemployment rates are less likely to hold jobs. On average, adolescents who work start with their first part-time job at age 14. While supplementing pocket money is the leading reason for taking the first job for both male and female adolescents, young women are more likely to start their first job because the work interest them. Comparing the type of job adolescents hold, between male and female adolescents differences exist. About 60% of male adolescents hold a delivery job. While young women also favor delivery jobs, in the female sample a more heterogeneous pattern with respect to types of jobs exists. In addition to delivery jobs, service and care jobs are further

frequently mentioned types of jobs female adolescents hold. Working part-time after school affects time that is spent in other activities. On weekdays and weekend days, teenagers who work sleep less and spend more time with academic learning. Further, they spend less time with structured activities and more time with unstructured activities on a weekend day. Focusing on the time use of employed adolescents, employment reduces time spend with structured and unstructured activities. Further, it negatively affects time spend with academic learning, especially for female adolescents on a weekday, and time spend sleeping on a weekend day.

Employing a flexible strategy combining propensity score matching and regression techniques to account for self-selection, beneficial effects on the internal locus of control that measures the individual belief that events can be controlled by personal decisions and efforts as well as on the positive reciprocal behavior of male adolescents can be identified. In addition to promoting character skills, teenage employment improves the expectancy of female adolescents to have a fulfilling career and family life in later life. Surprisingly, no meaningful effects on the subjective expectancy to have a successful career can be detected. Focusing on the occupation choice strategies, teenage employment seems to improve the knowledge on which skills and talents school students have and reduces the importance of parents' advice with respect to their future career.

To check for the presence of selection on unobserved variables, the LATE framework normally used for instrumental variables estimations is applied. The results confirm the non-violation of the conditional independence assumption in most cases. Overall, the results support the hypothesis that working part-time while attending full-time schooling has a beneficial effect on the formation of character skills, expectations and provides valuable insights for adolescents into their interests and talents.

The remainder of this paper is organized as follows. Section 2 describes the data and the analysis sample. Section 3 lays out the econometric approach and gives detailed account of the propensity score model. The empirical results are presented in Section 4. Section 5 concludes. The Appendix contains the tables and figures.

2 Data and Analysis Sample

To analyze the effect of working part-time while in full-time education on character skills and occupational choice strategies, this paper uses the following two data sets. The German Socio-Economic Panel Study (SOEP)is a representative

annual household panel covering more than 11,000 households in Germany.[4] In addition to the standard household and person questionnaire, the SOEP conducts since 2000 a specific youth biography questionnaire targeting all youths turning 17 in the corresponding year.[5] It includes detailed information on family background and childhood, involvement in different leisure activities, school performance, future education and career plans as well as attitudes about different topics. Further, I add past parental questionnaires to construct further variables describing the family background such as parental earning and employment history. The final sample is restricted to youths who attend a secondary school in the year in which they complete the questionnaire.[6] All adolescents who have a part-time job during secondary school are defined as treated.

Table 1 in the Appendix shows the sample size and the number of teenagers in the treatment and control group in the SOEP sample separated by gender. Table 2 provides information on the age at which they started to work and why they decided to work. In both samples about 38.5% of teenagers have had at least one job during full-time schooling. On average, male teenagers were nearly two months older than female teenagers when they started their first part-time job. Most teenagers started to work to supplement their pocket money. 84.7% (80.3%) of male (female) adolescents who have ever had a job did their first job to become at least partially financially independent from their parents. Nevertheless, teens find value in employment far beyond financial necessity, especially young women. 15.7% (11.8%) of female (male) teenagers mention interest as main reason. The difference of 3.9%-points is significant at the 10% significance level.

— Insert table 1 here. —

— Insert table 2 here. —

Despite the wealth of valuable information, the SOEP lacks detailed information on in-school work experience. It neither provides information on the type of job adolescents hold nor, as a consequence thereof, information on job characteristics. Previous research suggests that the type of job and its intensity may matter. Rauscher et al. (2013) study how beneficial a part-time job for the human capital accumulation of

[4] I use the data distribution 1984-2012, `http://dx.doi.org/10.5684/soep.v29`. See Wagner et al. (2007), Wagner et al. (2008) and Schupp (2009) for further information.

[5] In 2001, 18- and 19-year-old first time respondents were also considered in the questionnaire.

[6] Secondary school includes Hauptschule, Realschule, Gymnasium, and Gesamtschule.

adolescents can be and find that not only the activity of work but also the quality of work matters. Thus, if jobs for teenagers differ in their characteristics such as the variety of required skills or the degree of autonomy, the effect of adolescent employment on character skills is likely to depend on the type of job. Greenberger and Steinberg (1986) discuss the importance of meaningful jobs for teenagers in more detail.

The Time Budget Survey (TBS), in contrast, provides more detailed information on adolescent employment. The TBS is a representative survey provided by the Federal Statistical Office conducted in 1991/92 and 2001/02.[7] For the analysis I concentrate on wave 2001/02 to get a sample that is more comparable to the SOEP sample. Further, the sample is restricted to teenagers aged between 13 and 18 who attend secondary school in the year in which the survey was conducted. It provides information on work intensity measured by the number of hours worked per week and the type of job.[8] Due to different questions, the treatment definition in the TBS sample differs somewhat from the treatment definition in the SOEP sample. In the TBS all adolescents who have a paid job at the time of the survey are counted as treated.

Besides the quality of work, the effect of working part-time while in full-time education may also be at least partially driven by an employment-induced reduction or increase in time adolescents spend with other, for the development of skills relevant, leisure activities. In this case, it would be useful to know how working after school affects the amount of time that is spent with other leisure activities. While the SOEP offers only a crude measure of the intensity of various leisure activities, the TBS provides detailed information on how time is allocated to more than 200 kinds of activities of all household members aged ten and older on three days, two weekdays and one weekend day, measured in 10 minute intervals.[9,10]

Tables 3 and 4 show the sample size, the share of employed adolescents and the type of job they have. Overall, 25% of male and 21.4% of female adolescents are employed during full-time schooling. For both males and females, delivery jobs

[7] See `https://www.destatis.de/EN/FactsFigures/SocietyState/IncomeConsumptionLivingConditions/TimeUse/Current_Information_ZBE.html` for more information.

[8] Information on the type of job is captured by the StaBuA 1992 Job Classification at the two digit level. For each two digit category I take the most likely job (type), listed on the four digit level, teenagers can do and present it in table 4.

[9] The SOEP measures the frequency of leisure activities by the categories daily, weekly, monthly, less often, and seldom

[10] See Ehling, Holz, and Kahle (2001) for further information on the TBS wave 2001/02.

are the most common type of job. Among employed male teenagers 57.5% hold a delivery job while any other category is mentioned by less than 7%. A more heterogeneous picture with respect to the type of job emerges for female adolescents. Although delivery jobs are also the most frequent type of job (21.1%), other jobs such as waitressing (15.6%), babysitting (14.3%), and tutoring (12.2%) are also mentioned frequently. These patterns are in line with existing research. Kooreman (2009) confirms a gender-specific occupational segregation for adolescents. Using a sample of Dutch school students, he finds that the selection in a particular part-time job depends strongly on students' gender. Despite equal education, female students tend to work in lower-paying occupations such as baby-sitting or working in a supermarket while male students choose better-paid jobs such as delivering newspapers. In addition, panel (b) of table 4 shows the number of hours adolescents work per week. While male teenagers work 4.24 hours per week on average, females work 4.87 hours per week. The evidence so far supports the implementation of a gender-specific analysis to control indirectly for heterogeneous job effects assuming that within gender occupation characteristics are more homogeneous than between gender.

— Insert table 3 here. —

— Insert table 4 here. —

Besides the quality of work, the effect of working while attending secondary school may also at least partially be driven by an employment-induced reduction or increase in time spend with other, for the development of skills relevant, leisure activities. In this case, it would be useful to know how working after school affects the time spend with other leisure activities. While SOEP offers only in categories aggregated leisure activities with frequencies measured only roughly, the TBS provides detailed information on how time is allocated to more than 200 kinds of activities of all household members aged ten and older on three days, two weekdays and one weekend day, measured in 10 minute intervals.[11,12]

[11]The SOEP measures the frequency of other leisure activities by the categories daily, weekly, monthly, less often, and seldom

[12]See Ehling, Holz, and Kahle (2001) for further information on the TBS wave 2001/02.

3 Analytic Framework

3.1 Conceptual Background

For estimating the production function of character skills, I assume that adolescents' competencies are an outcome of a cumulative process of skill acquisition. Past and contemporaneous inputs in combination with adolescents' individual genetic endowment are assumed as determinants of the production process.[13]

The production function is given by:

$$Y_{ij} = f(\mathbf{X}_{ij}, T_{ij}, \mu_j^f, \mu_{ij}^c)$$

where Y_{ij} is character skill Y of adolescent i in family j measured at age 17.[14] Y_{ij} is explained by $\mathbf{X}_{ij}$, a vector that includes inputs by the family, school and the adolescent himself and assumed to be relevant for the development of character skills and T_{ij}, a dummy variable indicating whether an adolescent works during full-time schooling. The adolescent's individual pretreatment skill endowment consists of a family-specific part μ_j^f that is constant across siblings and a child-specific part μ_{ij}^c. Both are not observed by the researcher. Estimating the contribution of teenage employment on the development of skills, however, would lead to misleading results if we do not consider the pretreatment endowment of character skills in the production process. Because of the non-random nature of teenage employment, teenagers may self-select into employment depending on their already existing abilities. Further, the pretreatment skill endowment may have a direct effect on the acquisition of further skills as well as on school and family inputs.

Because the actual pretreatment endowment is unobserved, variables which are related to the unobserved pretreatment skill endowment are used as proxies. Due to the richness of information contained in the SOEP, I am able to use a bundle of variables as proxies which reflect different aspects of the endowment of skills at an early age.

Character skills of parents are the first proxies. Empirical research documents a sub-

[13] Todd and Wolpin (2003) give a theoretical overview of modeling production functions for abilities depending on various data limitations. While they concentrate on the specification of the production function of cognitive skills, this paper focuses on the production process of non-cognitive skills.

[14] To increase the sample size, I include observations of locus of control observed in the person questionnaire at an older age if no information is available at age 17. Further, reciprocity is only observed at an older age. To control for age when character skills are measured, age dummy variables are included in the final analysis.

stantial intergenerational transmission of abilities. Black, Devereux, and Salvanes (2009) for Norway and Björklund, Eriksson, and Jäntti (2010) for Sweden find a positive relation in cognitive abilities of parents and their offspring. Using the SOEP, Anger and Heineck (2010) confirm the positive relation in cognitive abilities of parents and their offspring even after controlling for educational attainment and family background.[15] These results stress the importance of parental investment for the accumulation of cognitive abilities of children. A growing body of research extends the analysis to character skills and confirms their intergenerational transmission, however at a lower level.[16]

Further proxies for the pretreatment skill endowment are birth order, the school recommendation at the end of grade four given by the class teacher, and whether adolescents grew up with both parents. Price (2008) and Black, Devereux, and Salvanes (2009) show that birth order affects children's cognitive skills negatively. Later-born children tend to exhibit lower cognitive abilities than their older siblings. Black et al. challenge the hypothesis that biological factors play a role in explaining skill deficits since later-born siblings have on average better birth characteristics. First- and later-born children experience a different childhood. First, firstborns may benefit from having the exclusive attention of their parents. Parents may not be able to invest the same amount of time in later-born children as they invested in firstborns at the same age. Second, firstborns may benefit from having younger siblings to teach and being responsible for them. On the other side, children's development of character skills may benefit from interactions with older siblings (Dai and Heckman, 2013). Lehmann, Nuevo-Chiquero, and Vidal-Fernández (2013) and Buckles and Kolka (2014) find that mother's early investment decreases with birth order. Lehmann et al. notice that not only cognitive but also character skills are affected by birth order such as a lower self-reported sense of general self-worth and self-competence at age 8.

School recommendation at the end of grade four given by the class teacher, as a further proxy, depends in most federal states on the school performance in the basic subjects math, German and a third subject as well as on the child's learning behav-

[15]They extend the analysis by distinguishing between cognitive skills based on past learning and cognitive skills which are related to innate abilities. Using scores of a verbal fluency test as a proxy of crystallized intelligence which is related to knowledge and skills acquired in the past and scores of a cognitive speed test as a proxy of fluid intelligence which is related to innate abilities, they find a stronger transmission of cognitive skills based on past learning.

[16]See Anger (2012), Dohmen, Falk, Huffman, and Sunde (2009) and Grönqvist, Ockert, and Vlachos (2010).

ior and work attitude.[17] Academic performance depends not only on cognitive but also on character skills. Blickle (1996) points out the importance of Big Five's conscientiousness and openness to experience for successful learning strategies. John, Caspi, Robins, Moffitt, and Stouthamer-Loeber (1994) find positive correlations between character skills and teachers' report of adolescents' academic performance. Heaven, Mak, Barry, and Ciarrochi (2002) pay attention to adolescents' personality and their attitudes to school finding high values of conscientiousness and introversion as significant predictors of school attitudes. Comparing the school recommendation given by the class teacher and the school preference of parents across different social classes, Dombrowski and Solga (2009) conclude that children with the same reading competencies and basic cognitive skills, an indicator for learning potentials, but with higher educated parents are more likely to attend the academic school track[18] than children from lower social classes with less educated parents. They suggest that inequalities in the family's cultural capital, human capital that is related to attitudes and knowledge needed to succeed in the current educational system, will not be compensated in the elementary school and become more important in the explanation of the acquisition of further competencies. Thus, the given school recommendation is a good proxy for the endowment of cognitive and character skills in the pretreatment period.

The fourth and last proxy of the pretreatment endowment of character skills is family structure during childhood. Possible reasons for a positive effect of living together as married couple on children's character are a lower probability of living with economic hardship, more family routines and father involvement as well as less maternal psychological distress and parenting stress than in comparison to their single counterparts. Bachman, Coley, and Carrano (2012) find for adolescents in low-income families with two parents a better emotional and behavioral functioning, measured by mother's report on children's behavior problems such as anxiety, depression, aggression, and rule breaking actions, than for adolescents living with a single parent. Carlson and Corcoran (2001) confirm these results. However, after including measures on maternal mental health and family income, family structure becomes insignificant in the explanation of behavioral problems of children.

[17] In Germany the school recommendation given by the class teacher is not in each federal state mandatory anymore. Nonetheless most parents are guided by the teacher's recommendation in transferring their child to one of the different secondary school types. See Stubbe, Bos, and Euen (2012) for a detailed discussion.

[18] The academic school track, Gymnasium, lasts until grade twelve or 13 and prepares for university entry.

3.2 Econometric Approach

To estimate the effect of working part-time while attending secondary school on a set of character skills and occupational choice strategies, I apply the potential outcome approach (Neyman, 1923; Roy, 1951; Rubin, 1974). The treatment effect for each individual i is defined as

$$\Delta_i = Y_i^1 - Y_i^0 \,,$$

where Y_i^1 is the potential outcome if individual i is treated and Y_i^0 if not. For each individual i the observed outcome is given by:

$$\begin{aligned} Y_i &= Y_i^1 \cdot T_i + Y_i^0 \cdot (1 - T_i) \\ &= Y_i^0 + T_i \cdot (Y_i^1 - Y_i^0) \,, \end{aligned}$$

where the expression in parentheses in the second line corresponds to the individual-level treatment effect. Because either Y_i^0 or Y_i^1 can be observed, individual-level treatment effects cannot be identified. Therefore, the interest lies in identifying the population average treatment effect on the treated Δ_T,

$$\Delta_T = \mathrm{E}[Y^1 - Y^0 | T = 1] = \mathrm{E}[Y^1 | T = 1] - \mathrm{E}[Y^0 | T = 1].$$

In experiments in which treatments are randomly assigned and treated and non-treated individuals do not differ systematically in (un-)observed characteristics, the average potential non-treatment outcome of the treated $\mathrm{E}[Y^0|T = 1]$ can be replaced by the observed average non-treatment outcome of the non-treated $\mathrm{E}[Y^0|T = 0]$ and treatment effects can easily be estimated by calculating the mean difference in the outcome of interest between treatment and non-treatment/control group. In observational studies, however, the assumption of a random treatment assignment cannot be maintained anymore. Treated and non-treated individuals may differ in characteristics which simultaneously affect the treatment assignment and the potential outcomes. Thus, individuals in both groups would differ in their outcomes even in the absence of a treatment and calculating the treatment effect as the difference in means of the observed outcomes would then lead to biased results. Under the conditional independence assumption (CIA) however, treatment assignment and potential outcomes become independent after conditioning on all covariates that influence simultaneously the assignment into treatment and potential outcomes. For

the analysis I use conditional mean independence as a weaker assumption that can be formulated as follows:

$$\mathrm{E}[Y^j|\mathbf{Z}, T=1] = \mathrm{E}[Y^j|\mathbf{Z}, T=0] = \mathrm{E}[Y^j|\mathbf{Z}]\,,\ j \in \{0,1\}\,;$$

with $\mathbf{Z}$ including for the development of character skills relevant inputs by the family, school and the adolescents himself as well as proxies for the pretreatment endowment of character skills that affect the potential outcome Y^j and treatment status T. The overlap assumption, as second assumption, is defined as

$$0 < \Pr(T=1|\mathbf{Z}) < 1$$

with $\Pr(T{=}1|\mathbf{Z})$ as the probability of treatment assignment given $\mathbf{Z}$. This assumption ensures that a sufficient overlap in the characteristics of treated and non-treated individuals to find adequate matches exists.

Finally I assume that potential outcomes are independent of the treatment status of other individuals, ruling out general equilibrium effects.

3.3 Specification of Propensity Scores and Balancing Tests

The propensity score is estimated separately by gender. For each propensity score model I use two strategies to optimize the model specification. On the one hand, to increase the common support region, I make the propensity score distribution of treated and non-treated individuals as similar as possible. For instance, I compare individuals with a given treatment status and extreme values of the propensity score with individuals with the opposite treatment status and slightly less extreme propensity score values. Then, for this sub-sample, I identify all covariates in the propensity score model in which treated and non-treated individuals differ significantly. If these covariates are highly insignificant in the explanation of the treatment assignment, I omit them. This procedure makes the propensity score distribution of treated and non-treated adolescents more similar without deleting relevant covariates.[19] As elaborated in Rosenbaum and Rubin (1983) in nonrandomized experiments a direct comparison of an outcome variable between treated and non-treated individuals would lead to misleading results because both treatment groups may differ systematically in their characteristics. These systematic differences could then

[19] I only remove covariates if the p-value of their coefficients in the estimated propensity score model is larger than 0.3.

lead to differences in the outcome variable even in the absence of the treatment. The balancing property of the propensity score states that

$$\mathbb{E}[\mathbf{Z}|T, \Pr(\mathbf{Z})] = \mathbb{E}[\mathbf{Z}|\Pr(\mathbf{Z})]$$

Given the propensity score $\Pr(\mathbf{Z})$, observed characteristics $\mathbf{Z}$ are independent of the assignment into treatment. Smith and Todd (2005) suggest the following balancing test to assess whether both treated and non-treated individuals do not differ in their observed characteristics on average. For each propensity score covariate, the following regression is estimated:

$$\begin{aligned} Z_k = \gamma_0 + \gamma_1 \widehat{\Pr}(\mathbf{Z}) + \gamma_2 \widehat{\Pr}(\mathbf{Z})^2 + \gamma_3 \widehat{\Pr}(\mathbf{Z})^3 + \gamma_4 \widehat{\Pr}(\mathbf{Z})^4 + \gamma_5 T + \gamma_6 T \widehat{\Pr}(\mathbf{Z}) \\ + \gamma_7 T \widehat{\Pr}(\mathbf{Z})^2 + \gamma_8 T \widehat{\Pr}(\mathbf{Z})^3 + \gamma_9 T \widehat{\Pr}(\mathbf{Z})^4 + \nu, \end{aligned}$$

with Z_k as the k-th covariate of the propensity score model, $\widehat{\Pr}(\mathbf{Z})$ as the propensity score estimated with covariates $\mathbf{Z}$, T as a dummy variable indicating the treatment status, and ν as an idiosyncratic error term. Regressing each propensity score covariate Z_k on polynomials of the propensity score up to the fourth degree, the treatment dummy, and interactions between treatment dummy and the before-mentioned polynomials, I test whether all coefficients of covariates in which the treatment dummy is included are jointly significant. If yes, then even after conditioning on the propensity score, the treatment status predicts values of the covariate and indicates an unsuccessful balancing of the covariate. If a covariate does not satisfy the Smith/Todd balancing test, I either drop it if this covariate is highly insignificant in the propensity score model or I modify it to fulfill the balancing test criterion if the covariate has a significant effect on treatment assignment.[20]

All variables in $\mathbf{Z}$ that are used to explain the probability of working while attending full-time schooling and are assumed to be relevant for the acquisition of character skills can be categorized into four groups. The first group of covariates includes parents' characteristics such as their educational attainment and past earnings as well as their employment history and age. Further, parents' character skills measured by Big Five personality traits, locus of control and their reciprocal behavior are included. The second group of covariates consists of variables that measure the

[20]In the latter case, I create interaction terms between the affected covariate and a further covariate. The motivation of this procedure is to control successfully for heterogeneous influences of the corresponding covariate on the probability of being treated that otherwise would lead to a rejection of the Smith/Todd test if not considered.

quality of the parent-child relationship reported by adolescents such as whether adolescents argue or fight with parents on a regular basis, how important parents are, and how often various situations occur which are summarized into a factor that explains the quality of supportive parenting. The third group of covariates includes children's characteristics, for instance their migration background, quarter of birth, birth order, the school recommendation at the end of the fourth grade given by the class teacher, and the frequency of performing various leisure activities measured at age 17. The fourth group consists of annual dummies. Table 5 gives an overview on some balancing tests and key figures of the propensity score models. For about 93% of all covariates in a given propensity score specification the Smith/Todd-test fails to reject at the 10% significance level, see panel (a). A test for equality of means for each covariate between treatment and control group shows a perfect balancing of means after matching, see panel (b). Panel (d) shows the share of observations within the common support regions that is defined as the region between the smallest estimated propensity score of the treated sample and the largest estimated propensity score of the non-treated sample. Observations outside of the common support region are excluded from the further analysis. Table 6 shows results of Hotelling T^2 tests of the joint null hypothesis of equal means between treatment and non-treatment group of all of the variables included in the before mentioned covariate groups. In sum, after matching I find a perfect balancing of means between treatment and comparison group within each covariate category.

— Insert table 5 here. —

— Insert table 6 here. —

The SOEP offers a richness of information to approximate relevant factors which influence both treatment assignment and outcomes of interest. Further, various balancing tests conducted before and after matching show that both treatment and non-treatment group are balanced in observed characteristics. Both encourage the plausibility of the non-testable conditional mean independence assumption.

3.4 Estimation of Treatment Effects

The estimation follows Fuchs and Osikominu (2016) and proceeds in two steps. First, I estimate for male and female adolescents propensity scores separately. I implement matching on propensity scores and calculate matching weights as follows using the

example of the average treatment effect on treated, Δ_T.[21] The sample consists of n_T treated and n_U non-treated adolescents.

Using propensity score matching, for each treated adolescent a comparable "statistical twin" is calculated as weighted average over all non-treated adolescents. Using a Gaussian kernel, each non-treated adolescent j receives weight w_{lj} depending on his similarity to treated adolescent l with respect to the estimated propensity score.

$$w_{lj} = \frac{K[\widehat{\Pr}(\mathbf{Z}_j) - \widehat{\Pr}(\mathbf{Z}_l)]}{\sum_{j=1}^{n_U} K[\widehat{\Pr}(\mathbf{Z}_j) - \widehat{\Pr}(\mathbf{Z}_l)]}$$

with K denoting the Gaussian Kernel, $\widehat{\Pr}(\mathbf{Z}_j)$ and $\widehat{\Pr}(\mathbf{Z}_l)$ as the estimated propensity score of non-treated adolescent j and treated adolescent l, respectively.[22] Because all observations in the analysis are in addition weighted by survey weights v offered by SOEP, the sum of the weights over all non-treated individuals used to generate a "statistical twin" for treated individual l does not equal to one but equals the survey weight of treated individual l, $\sum_{j}^{n_U} w_{lj} = v_l$. This procedure is repeated for each treated adolescent. Thus, for each non-treated adolescent I get as many weights as treated adolescents exist and sum then, at the end, up. More formally, each observation is weighted as follows for the estimation of Δ_T.

$$g_j = \sum_{l}^{n_T} w_{lj},$$

where g_j is the matching weight for non-treated adolescent j and

$$g_l = v_l$$

where g_l denotes the matching weight for treated adolescent l that is equal to his survey weight.[23]

[21] Potential outcomes are estimated by a local constant and a local linear Gaussian kernel regression. Treatment effects presented in this paper are based on matching weights of the local constant weighted regression due to slightly better balancing test results.

[22] Instead of the conditional probability I use an index function to avoid compressions near zero and one.

[23] The procedure to calculate weights for estimating the average treatment effect on untreated, Δ_U, is identical, however, treated adolescents are used to create statistical twins for each non-treated adolescent. The final matching weights are $g_l = \sum_{j}^{n_U} w_{lj}$ and $g_j = v_j$ for treated and

In a second step, I run for each outcome variable an ordinary least squares regression in which individuals are weighted by the before-mentioned weights g. For Δ_T, for instance, we have the following minimization problem

$$\min_{\{\hat{\beta}_0,\hat{\beta}_T,\hat{\boldsymbol{\gamma}},\hat{\boldsymbol{\delta}}\}} \sum_{i}^{n} g_i \Big[Y_i - \hat{\beta}_0 - \hat{\beta}_T \, T_i - \sum_{k} \Big\{ \hat{\gamma}_k \, Z_{ik} - \hat{\delta}_k \, T_i (Z_{ik} - \overline{Z}_{kT}) \Big\} \Big]^2 ,$$

where $i = 1, 2, \ldots n$ indexes observations, β_T corresponds to the treatment effect of interest, here Δ_T, $\overline{Z}_{kT}$ identifies the average of Z_k over the treated subsample, and g_i represents the matching weight of individual i.[24]

The combination of propensity score matching and regression techniques is known as doubly robust estimation and has several advantages. First, because propensity score outliers get smaller weights, this method avoids comparisons based on extrapolations not supported by the data. Second, the estimated treatment effects are consistent if at least one of both propensity score and outcome regression model is correctly specified (Robins and Ritov, 1997 and Imbens, 2004). Therefore, the estimated treatment effect is robust to misspecifications of one of both models.

I obtain standard errors and confidence bands for the estimated treatment effects through bootstrapping based on 500 resamples. I resample families to account for correlation across siblings. In each resample, I recomputed the propensity score using a draw from the asymptotic distribution of the coefficients in the propensity score model. This allows me to take account of the estimation error in the propensity score.

4 Empirical Results

4.1 Descriptive Statistics

Table 7 in the Appendix shows a positive selection into teenage employment in the SOEP sample. For both gender, adolescents who work part-time during full-time schooling have on average higher-educated parents. 27.5% of employed male and 28.8% of employed female teenagers have at least one parent with a general qualification for university entrance (Abitur). For teenagers who never had a job the

non-treated adolescents, respectively.

[24]The analogous procedure is conducted to estimate Δ_U, the average treatment effect on the untreated.

percentage of educated parents is significantly smaller.[25] In addition to their higher education, parents of employed male and female adolescents earn on average € 2,500 per year more than parents of teenagers with no work experience.[26] Further, parents of employed teenagers were less non-employed and more likely to be self-employed in the past.[27] Beside economic factors, parents of employed and non-employed adolescents differ also in their personality. Especially in measures of trust and past trusting behavior, parents of school students with work experience show a significantly higher tendency to trust others.[28] Not only their parents, but also teenagers differ with respect to their characteristics. For both male and female adolescents, employed teens are more likely to have a teacher's recommendation given at the end of grade four to continue on the academically oriented school track and they are more likely to attend this school track at age 17. Further, they are less likely migrants and more engaged in their leisure time at age 17. For instance, employed teenagers are more likely to do sports on a daily basis and they have been more active in formal extracurricular activities. 46.3% of male and 53.8% of female school students who have a job are active as class or student body president or are involved in the school newspaper. In the sample of non-employed teenagers the fraction of students who performs such activities is significantly smaller. Besides these rather formal types of additional school activities, adolescents who work part-time are more active in less formal types of extracurricular activities. 66.6% (75.6%) of male (female) employed adolescents are involved in school theater or dance groups, and school orchestra or sports groups at school. Again, for non-employed adolescents the fraction is significantly smaller. Besides family and individual characteristics, regional conditions can also affect the employment status of teenagers. For both males and females, I find significantly higher unemployment rates in regions in which teenagers who have

[25]With the exception of parents' tertiary education – a dummy variable that takes on the value one if at least one parent has a university degree – of male teenagers where no significant difference can be found.

[26]The variable *Parental Earnings* is the average of past annual earnings up to ten years. In the final analysis I include not only the mean but also the standard deviation to control for past income fluctuations.

[27]For father's past self-employment status, however, the pattern is less clear. The parents' employment status variables show the percentage of years parents were self- or non-employed in the last ten years, respectively.

[28]Both measures of trust are standardized variables created by a factor analysis using three items for each trust variable. While general trust measures the individual expectation of the trustworthiness of other people, past trusting behavior is an indicator of how intensive one has supported and cooperated with friends. See Glaeser, Laibson, Scheinkman, and Soutter (2000) and Naef and Schupp (2009) for a more detailed discussion of trust measured by surveys and experiments.

never worked live.[29] In addition, teenagers with no work experience are more likely to live in East Germany and they rather grew in large cities.

A similar pattern can be found in the TBS sample. Table 8 shows that parents of employed adolescents are on average higher educated and more likely to be self-employed. Further, adolescents with work experience are more likely to live in financially well-off households. They are more likely to attend an academically oriented school track and less likely to live in East Germany.

In sum, adolescents who have a job during full-time schooling have a more advantaged family background. Their parents are higher educated and earn more, they invest more time with meaningful leisure activities, and they are more likely to live in economically strong regions. A first interpretation of these findings is, that adolescents work besides full-time schooling not because the households in which they live are under economic pressure and in need for further sources of income, but rather to supplement their pocket money and/or of personal interest in the job.

The existing literature suggests a positive selection into early employment. Youths from families with low socio-economic status (SES) face disadvantages in finding suitable jobs while attending full-time schooling. Because of the relationship between ethnicity and SES, the US literature identifies significant ethnicity differences in adolescents' high school employment status. Hirschman and Voloshin (2007) find that black high school students face disadvantages in finding suitable jobs. Either they do not hold a job or the job is time-consuming and affects negatively the academic learning time and grades. In addition, black students are less likely to perform white-collar work. Instead, if they hold a job, they have low-paid blue-collar jobs which offer in most cases a lower quality of human capital input compared to white-collar jobs. The authors conclude that social networks, spatial mismatch, and employer preferences may matter for this finding. Hotz, Xu, Tienda, and Ahituv (2002) and Kalenkoski and Pabilonia (2012) confirm these ethnical differences in student employment.

— Insert table 7 here. —

— Insert table 8 here. —

The TBS gives a detailed overview of the daily time allocation. For each respondent

[29]The local unemployment rate is measured at the level of regional spatial planning units (Raumordnungsregionen) which are aggregates of counties (Kreise). Overall, Germany consists of 96 Raumordnungsregionen.

time use on three days, two weekdays and one weekend day, is measured in ten minute intervals. I summarized the initial 230 activity categories to 11 thematically different groups. Tables 9 and 10 compare time allocation of teenagers with and without a job on weekdays and weekend days, respectively.[30] On a normal weekday, see table 9, adolescents spend about 5 times more time with unstructured activities such as watching TV or peer activities than with structured activities such as playing music or athletic involvement.[31] While, on average, adolescents spend one hour per weekday with structured activities, they invest slightly more than 5 hours per weekday in unstructured activities. They sleep about eight hours and commute about 90 minutes per weekday. Further, male teenagers spend about ten minutes less with academic learning and about 40 minutes more with unstructured activities than female teenagers. Comparing time use between teenagers with different employment status, male (female) teenagers who hold a job, spend 23.1 (40.4) minutes less with sleeping than their non-employed counterparts. Further, employed adolescents spend less time with unstructured and more time with structured and learning activities. The differences in the last three categories, however, are not significant.

The general time use pattern on a normal weekend day is quite similar, see table 10. Adolescents spend 150 minutes more with unstructured activities than on a weekday and at least 5 times more time than with structured activities. Adolescents in general and especially female teenagers spend much less time with academic learning than on a weekday. Further, adolescents sleep 60 to 70 minutes more on a weekend day. However, as on a weekday, employed teenagers sleep significantly less than non-employed teenagers. Further, teenagers who hold a job, spend about 10 minutes more with learning and unstructured activities. On the other side, employed male (female) teenagers spend 12.3 (24.5) minutes less with structured activities.

In sum, adolescents spend much more time with unstructured than with structured activities on each day. Female adolescents invest more time in learning activities than male adolescents. Further, employed adolescents sleep significantly less than their

[30]The definition of being employed while attending full-time schooling is not consistent with the observed time use. Although some adolescents indicate that they do not hold a job, time allocated to employment specific activities can be found in their time diaries. For instance, male adolescents who negated the question, spend on average 13 minutes on a weekday with job specific activities. These 13 minutes split to 4.3 minutes spend with an internship, 3.3 minutes spend with an unpaid activity that is related to employment of other people, 2.2 minutes spend with own secondary employment, 2 minutes spend with activities related to own main employment, 0.7 minutes spend with breaks during working time, and 0.5 minutes spend with job search.

[31]Structured activities are defined as activities that take place in an organized setting and/or involve goal-directed efforts. Unstructured activities cover sedentary activities and activities with peers. A detailed explanation of which activities are covered in each category can be found on page 46.

non-employed counterparts. Especially female adolescents sleep less when holding a job. Employed adolescents spend more time with learning activities, especially on a weekend day. While the amount of time spent with structured and unstructured activities are quite similar on a weekday, on a weekend day adolescents who hold a job spend less time with structured and more time with unstructured activities.

— Insert table 9 here. —

— Insert table 10 here. —

Tables 11 and 12 show how working part-time affects the time allocation of employed teenagers on weekdays and weekend days, respectively. On average, male (female) adolescents work 162.7 (184.4) minutes on a working weekday, see table 11. When working, male (female) adolescents reduce significantly time invested in unstructured activities such as relaxing, watching TV and video and peer activities by 131.4 (88.3) minutes on a weekday. Learning and structured activities are also negatively affected by working on a weekday. Especially for female teenagers the reduction of time is considerable. When working, female adolescents spend 27 minutes less with academic learning than on non-working weekdays and they even spend even less time with homework and academic self-learning than male teenagers who works (39.8 vs. 47.3 minutes). In addition, transit time of female adolescents increases significantly by 23.7 minutes when working.

On a weekend day, see table 12, male and female adolescents work on average 167.7 and 200.8 minutes, respectively. Working on a weekend day reduces significantly sleeping time for female (male) adolescents by 81.8 (40.7) minutes. Further, male and female adolescents spend 101.1 (54.8) minutes less with unstructured activities on a weekend day when working. Learning and structured activities are also negatively affected, however, by an insignificant amount of time.

In sum, working part-time while in full-time education reduces the amount of time adolescents spend with activities which are suggested to be harmful for the development of skills such as media use. However, it also reduces time adolescents invest in activities which are suggested to be beneficial such as academic learning.[32] Further, the amount of sleep is negatively affected by working part-time on weekend days. Especially female teenagers reduce the amount of sleep when working.

[32]See Cardoso, Fontainha, and Monfardini (2010), Felfe, Lechner, and Steinmayr (2011), and Del Boca et al. (2012) for a more detailed discussion about which leisure activities are related to the acquisition of human capital and which activities are portrayed as harmful.

— Insert table 11 here. —

— Insert table 12 here. —

4.2 Early Employment, Character Skills and Expectations

Tables 13 to 14 show the sample means and treatment effects for behavioral outcome variables. The behavioral variables, derived from a series of factor analyses, are standardized to allow a comparison of effect sizes across outcomes. The results for male and female adolescents are reported separately.

Table 13 shows estimated effects of teenage employment on both locus of control factors.[33] The psychological concept of locus of control can be attributed to Rotter (1966). In general, it measures the individuals' perception of how much control over their life they possess. While external-oriented individuals are convinced that events in their life are results of luck and faith or other not controllable factors, internal-oriented individuals believe that they can determine and affect events in their life by own efforts and actions. Strauser, Ketz, and Keim (2002) find that people with a higher internal locus of control tend to persevere through tough times and to pursue a goal more successfully. Contrary to initial research, this paper assumes a non-perfect reverse connection between internal and external locus of control. Thus, two factors representing both underlying dimensions are constructed.

On average, male and female adolescents exhibit a similar external and internal locus of control, see column "Mean". Comparing sample means of treated and control units, see column "Raw Diff.", we see that treated teenagers are less externally and more internally oriented.[34] Especially for male teenagers this pattern is noticeable. Focusing on the treatment effect estimates, no significant effects of teenage employment on the external locus of control can be found. While male adolescents face a small reduction in their external-oriented perception, for females an effect is less detectable. The effect of teenage employment on the internal locus of control, in contrast, is more substantial. Considering the ATE, employment during full-time schooling leads to an 18% of a standard deviation increase in the internal-oriented

[33]Both factors are extracted by a factor analysis based on 10 items. The construction of both factors is identical with Dohmen, Falk, Huffman and Sunde (2008). Further, both measures of locus of control are standardized. The estimated coefficients, therefore, can be interpreted as percentage change in terms of the outcome variable's standard deviation.

[34]Column "Raw Diff." shows the unconditional difference of sample means between treated and control units.

perception for male and a 14.7% increase for female adolescents. The estimated effects are statistically significant.

Locus of control has already been proven empirically as being a crucial determinant of economic success. For instance, Coleman and DeLeire (2003), Cebi (2007), and Báron and Cobb-Clark (2010) find that a one standard deviation higher internal locus of control leads to 1.4%-4.6% higher probability of high school graduation, partially, even after controlling for cognitive abilities.[35] Further, Osborne-Groves (2005), Heckman, Stixrud, and Urzua (2006), Cebi (2007), Flossmann, Piatek, and Wichert (2007), Judge and Hurst (2007), and Drago (2011) find significant effects on earnings in later life.[36] Osborne-Groves, for instance, find that a one standard deviation higher internal locus of control increases hourly wage by 5%-7%, after controlling for cognitive abilities.

— Insert table 13 here. —

Table 14 shows the effect of teenage employment on reciprocal behaviors.[37] Reciprocity describes how people react to kind and positive or impolite and negative interpersonal behavior of other people. While negative reciprocity corresponds to the willingness to punish uncooperative behavior of other people, a positive reciprocal behavior is related to rewarding cooperative and kind behavior. Gouldner (1960), as the classical reference, elaborates the meaning of reciprocity for the stability of social systems. Perugini, Gallucci, Presaghi, and Ercolani (2003) develop a further measure that, in addition to reciprocal behavior, identifies the belief in reciprocity defined as "Beliefs in the efficacy and widespread use of reciprocity-based behaviors and expectations of other's reciprocal behaviour (...) important (...) in predicting reciprocating behaviours ..."(Perugini et al., 2003, p.254). They find that reciprocal behavior is more pronounced the stronger the belief in its efficacy is. Further, they confirm that negative and positive reciprocity are not only "two sides of the same mechanism" (Perugini et al., 2003, p.256) but indicate two different personality dimensions.

[35]The significance of the effect of internal locus of control on educational attainment, however, change differently after including proxies for cognitive abilities. While Cebi finds no significant effects anymore, Coleman and DeLeire identify significant effects only after including proxies for cognitive abilities.

[36]Instead of locus of control, Drago observes the relationship between earnings and self-esteem, a personality trait that is positively related to internal locus of control.

[37]Due to lack of information on reciprocal behavior in the youth biography questionnaire, I construct both factors by using six items obtained from the person questionnaire in 2005 and 2010, respectively. Both factors are then extracted by a factor analysis. In addition, I control for the individuals' age when they completed the corresponding questionnaire.

Young men tend to be more negatively reciprocal and women are slightly more positively reciprocal, see column "Mean". While treated and non-treated male adolescents are quite similar in their negatively reciprocal behavior, female adolescents who work part-time while attending full-time education are ,on average, less negatively reciprocal than their non-employed counterparts. Further, for both males and females, employed teenagers are more positively reciprocal, see column "Raw Diff.". Focusing on the treatment effect estimates, an early employment increases (decreases) a negatively reciprocal behavior of male (female) adolescents. These effects, however, are highly insignificant. On the other side, an early employment increases noticeably the positive reciprocal behavior of male adolescents. Considering the ATE, working part-time while still in secondary school increases a positive reciprocal behavior of male teenagers by 18.4% of a standard deviation.

Brown, Falk, and Fehr (2004), Dohmen, Falk, Huffman, and Sunde (2009), Dur, Non, and Roelfsema (2010), and Kube, Maréchal, and Puppe (2012, 2013) find substantial relationships between reciprocal behavior and employment patterns. Using contemporaneous measures of reciprocity, Dur et al. find that positively reciprocal people are more sensitive to promotion instead of monetary incentives. Dohmen et al. identify that people with a high positive reciprocal behavior receive higher wages. Monthly earnings are increased by 0.9%-1.2% if positive reciprocity is increased by one unit.[38] In addition, they work harder and are less likely to be unemployed. Brown et al. confirm the latter finding. Further, they find that an increase in negative reciprocal behavior leads to a higher probability of unemployment.

— Insert table 14 here. —

Besides character skills, this paper also analyzes the effect of employment on future expectations of adolescents, see table 15. The youth questionnaire includes several questions about how adolescents assess the probability of various future events.[39] Each of the three factors measures different aspects of future expectations. The first outcome variable, successful career, measures how adolescents assess their success in the educational system and on the labor market. Adolescents with high values in this variable assess success in their training or university studies as very likely and their employment probability as very high. Male adolescents assess their future success slightly more likely than females, see column "Mean". The same is true for employed

[38]In their paper positive reciprocity is measured as the mean value of three items concerning positively reciprocal behavior scaled from 1 to 7.

[39]The subjective probability of each event is measured by a 11-point Likert scale from zero to 100% in 10%-points steps. The final factors are then extracted by a factor analysis.

teenagers in comparison to their non-employed counterparts, see column "Raw Diff.". Especially for females the difference in the subjective assessment of a successful career in the future is sizeable between adolescents who hold a job and who are not employed. The difference amounts to 12.1% of a standard deviation. Focusing on the treatment effect estimates, however, no significant effects of employment on the adolescents' subjective assessment of their educational and professional success later in life can be detected. Considering the ATE, an increase (decrease) of 6.2% (4.1%) of a standard deviation for females (males) is estimated. The second outcome variable, fulfilling career, measures how adolescents assess the probability to work abroad or to be self-employed. Again, we find that adolescents who work, assess the probability higher, especially females, than adolescents who do not hold a job, see column "Raw Diff.". Concentrating on the treatment effect estimates, a positive effect of teenage employment are identified that is significant for female adolescents. Considering the ATE, the subjective assessment of working abroad or being self-employed in the future is increased by 2% (15.7%) for male (female) adolescents. The results for the third outcome, fulfilling family life, is quite similar. It measures the adolescents' assessment of being married and having children in the future. Again, treated adolescents assess the probability higher, especially females. Focusing on the treatment effect estimates, we find significant and positive effects for female adolescents while no significant effects for males are detectable. Considering the ATE, the subjective assessment of female adolescents is increased by 14%.

— Insert table 15 here. —

4.3 Early Employment and Occupational Choice Strategies

Employment during full-time schooling may not only affect adolescents' character skills and expectations but may also provide valuable insights for adolescents into their interests and talents as well as offer them information on the world of work. The provision of these additional information may influence adolescents' behavior. The youth biography questionnaire includes questions about career and job plans, e.g. how adolescents would search for a future occupation and how well they are already informed about a future occupation. Table 16 shows how in-school work experience affects adolescents' occupational choice strategies.[40] I distinguish between three different strategies. Passive strategies imply that adolescents are either still

[40]Four statements about the importance of various strategies to choose an occupation each measured on a four-point Likert scale from *Apply completely* to *Don't apply at all* are used to extract three factors.

unsure of their talents and what would be the "right" occupation or they do not have the goal to find the one true occupation and take things as they come. Working part-time while attending full-time schooling reduces the approval to these statements. Considering the ATE, I find a similar effect for male and female teenagers. The importance of these passive strategies is reduced by 9.1% and 15.9% of a standard deviation for male and female teenagers, respectively. For females the reduction is statistically significant. Panel (b) shows the effect on active strategies. The second factor means that adolescents have already made a lot of efforts and thoughts to decide which occupation could be the best for them. For male and female teenagers I find an increase of 11.6% and 16% of a standard deviation in the agreement to these strategies. Again, the treatment effects for female adolescents are statistically significant. Panel (c) shows how the importance of parental-dominated strategies to find a future occupation is affected by an early employment. This factor illustrates the importance of parents' advice for making this decision. Again, the effect is quite similar for both genders. Male and female teenagers experience a reduction of 12.3% and 12.4% of a standard deviation in the importance of parents' advice. In sum, teenage employment reduces the importance of both passive and parental-dominated strategies and increases at the same time the importance of active strategies. For both genders the pattern of results is identical and for female adolescents more noticeable. The results confirm the hypothesis that working while attending secondary school provides adolescents with valuable information on their aptitudes and interests. It helps them to reduce uncertainties and makes them more independent from their parents.

— Insert table 16 here. —

4.4 Test of Self-Selection

Black et al. (2015) provide a set of simple tests for the presence of selection on unobserved variables. Using the LATE framework of instrumental variables estimation, a possible violation of the conditional independence assumption, which would indicate the presence of a selection bias, can be identified. Assuming the existence of instruments for the treatment dummy variable and monotonicity, i.e. assuming that instruments affect treatment status only in one direction, the two following equations are estimated:

$$\mathbb{E}(Y_1|T=1) = f(\mathbf{Z}) + \alpha_1 W$$

and

$$\mathbb{E}(Y_0|T=0) = f(\mathbf{Z}) + \alpha_0 W$$

with both potential outcomes Y_1 and Y_0 as a function f of covariates $\mathbf{Z}$ and instrument W. The first equation is restricted to adolescents who either comply with the instruments when treated (compliers) or always take treatment (always-takers). α_1 identifies differences in the expectation of Y_1 between compliers and always-takers and therefore a violation of the following conditional independence assumption CIA^1:

$$Y_1 \perp\!\!\!\perp T|\mathbf{Z}.$$

The second equation is restricted to adolescents who either comply with the instruments when not treated (compliers) or never take treatment (never-takers). α_0 identifies differences in the expectations of Y_0 between compliers and never-takers and therefore a violation of the following conditional independence assumption CIA^0:

$$Y_0 \perp\!\!\!\perp T|\mathbf{Z}.$$

To control for the presence of selection on unobserved variables, regional characteristics such as the general unemployment rate, share of people younger than 25 years on the total number of unemployed people and the gross domestic product are used as instruments.[41] Using regional characteristics as instruments for high school employment is an ordinary strategy in the US literature, see e.g. Ruhm (1997), Tyler (2003) and Erdogan, Jacobsen and Kooreman (2012).

Tables 17 to 20 shows p-values of a joint significance test of the instruments. For locus of control, see table 17, we do not detect any problems of self-selection for male adolescents. For female adolescents, however, the conditional independence assumption for the average treatment of treated, seems to be not fulfilled. For the average treatment effect of untreated no violation of the CIA can be detected. Table 18 shows a violation in the conditional independence assumption for the ATT for females. For the positive reciprocity, however, for both male and female adolescents there seems to be no violation of the CIA. For the future expectancies a partial violation of the CIA can be detected for male adolescents of the subjective assessment to have a fulfilling career and for female adolescents of their subjective assessment

[41] To be more concrete, 5-year averages of these three variables are used as instruments.

to have a fulfilling family life, see table 19. Table 20 shows results of the selection bias test for occupational choice strategies. Only for male adolescents a violation of the conditional independence assumptions for the ATT can be detected for passive and parental-dominated strategies. In sum, only in few cases a potential selection on unobserved variables can be detected.

5 Concluding Remarks

Adolescence is a stage of life in which people start to take decisions independently of their parents. While the influence of parents' investments on the development of human capital decreases, the amount of time adolescents invest in activities separately from their parents grows in importance. Working part-time while attending full-time schooling is often seen as a stepping stone toward independence and adulthood. It may promote responsibility, independence, and interpersonal skills at an early stage of life. A frequently mentioned concern, however, is that a part-time job may crowd out homework time and therefore may lead to worse grades and a lower educational attainment.

The existing literature documents a positive effect of teenage employment on later economic success, such as higher earnings and better job positions, that becomes negative if the amount of time spent working exceeds a critical threshold. While the reason for the negative relationship between working after school and economic success in adult life is well explained by the limited amount of time and the consequential reduction of time spend with academic learning, channels of the positive influence have not been examined empirically. Explanations of the positive influence could be that working part-time supports the development of skills which are important for later success in life such as promoting responsibility and time management skills, it may reduce uncertainties about own talents and interests, and make adolescents familiar with the world of work. This paper tests some of the possible explanations by focusing on character skills as important determinants of labor market outcomes and occupational choice strategies.

My main findings are as follows. First, I find a positive selection into teenage employment. Adolescents who have worked part-time during full-time schooling have on average higher-educated parents and live in financially well-endowed households. Their parents were less non-employed and more likely to be self-employed in the past in comparison to parents of adolescents who have never worked while attending school. Teenagers with a migration background or who live in regions with a

high unemployment rate are less likely to be employed. While supplementing pocket money was the leading reason for taking the first job for both male and female adolescents, young women were more likely to start their first job because the work interested them. Comparing the type of job adolescents hold, between male and female adolescents differences exist. About 60% of male adolescents hold a delivery job. While young women also favor delivery jobs, in the female sample a more heterogeneous pattern with respect to types of jobs exists. In addition to delivery jobs, service and care jobs are further frequently mentioned types of jobs female adolescents hold. Teenagers who work differ in their time use from non-employed teenagers. On weekdays and weekend days, teenagers who work, sleep less and spend more time with academic learning. Further, they spend less time with structured activities and more time with unstructured activities on a weekend day. Focusing on the time use of employed adolescents, employment reduces time spend with structured and unstructured activities. Further, it negatively affects time spend with academic learning, especially for female adolescents on a weekday, and time spend sleeping on a weekend day.

Employing a flexible strategy combining propensity score matching and regression techniques to account for self-selection, beneficial effects on the internal locus of control that measures the individual belief that events can be controlled by personal decisions and efforts as well as on the positive reciprocal behavior of male adolescents can be identified. In addition to promoting character skills, teenage employment improves the expectancy to have a fulfilling career and family life in later life for female adolescents. Surprisingly, no meaningful effects on the subjective expectancy to have a successful career can be detected. Focusing on the occupation choice strategies, teenage employment seems to improve the knowledge on which skills and talents school students have and reduces the importance of parents' advice with respect to their future career.

To check for the presence of selection on unobserved variables the LATE framework normally used for instrumental variables estimations is applied. The results confirm the non-violation of the conditional independence assumption in most cases. Overall, the results support the hypothesis that working part-time while attending full-time schooling has a beneficial effect on the formation of character skills, expectations and provides valuable insights for adolescents into their interests and talents. This study however, is limited by the lack of information on job characteristics. Depending on the type of job adolescents hold and the amount of time the spend working, the effect of the formation on character skills and expectations may vary.

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Tables

Table 1: Sample Size – SOEP

	Men Have Had a Job?		Women Have Had a Job?	
	Yes	No	Yes	No
	1452		1489	
	566	886	562	927
	(38.41%)	(61.02%)	(38.58%)	(61.42%)

Source: SOEP V29. Note: Proportions calculated with SOEP sample weights.

Table 2: Information on First Part-Time Job – SOEP

	Men	Women	Difference
(a) Age When Started First Part-Time Job			
	14.41	14.25	0.16*
	(1.53)	(1.64)	(0.09)
(b) Reasons for First Part-Time Job			
Interest	0.118	0.157	−0.039*
	(0.323)	(0.364)	(0.022)
Supplement Allowance	0.847	0.803	0.044*
	(0.360)	(0.398)	(0.024)

Source: SOEP V29. Note: Calculations use the SOEP sample weights. Standard deviations and standard errors (in column labeled "Difference") are in parentheses. *, ** and *** denote significance at the 10%-, 5%- and 1%-level, respectively.

Table 3: Sample Size – TBS

	Men Have a Job?		Women Have a Job?	
	Yes	No	Yes	No
	611		687	
	153	458	147	540
	(25.00%)	(75.00%)	(21.40%)	(78.60%)

Source: Time Budget Survey. Wave 2001/2002.

Table 4: Additional Information on Employment – TBS

Men		Women	
	Share		Share
(a) Types of Jobs			
1 Delivery Jobs	0.575	Delivery Jobs	0.211
2 Salesclerk	0.065	Other Service Jobs (Waitress)	0.156
3 Other Service Jobs (Waiter)	0.052	Care Jobs (Babysitter)	0.143
4 Tutors	0.046	Tutors	0.122
5 Agriculture and Forestry Jobs	0.039	Salesclerk	0.075
(b) Working Hours per Week			
4.24		4.87	
(4.37)		(4.24)	

Source: Time Budget Survey. Wave 2001/2001. Standard deviations are in parentheses.

Table 5: Summary of Common Support and Balancing Tests on Variables Included in the Propensity Score

	Men	Women
(a) Smith/Todd-Test		
p-Value≤ 0.05	2	1
p-Value≤ 0.10	5	3
(b) Test of Equality of Means		
Unmatched	15	20
ATT-Weights	0	0
ATU-Weights	0	0
(c) Total Number of Covariates		
	62	66
(d) Percent Within Common Support Region		
Treated	0.993	0.992
Nontreated	0.985	0.922
(e) Percentage of Correctly Predicted		
	0.641	0.662

Source: SOEP V29. Panel (a) shows the number of covariates for which the null hypothesis of no influence of the treatment status on a given covariate conditional on a polynomial of the propensity score is rejected. The rows in panel (b) show the number of covariates with p-values ≤ 0.05 in a t-test of equality of means in the treated and non-treated samples before and after matching. Panel (c) shows the final number of covariates used for estimating the propensity score model. Panel (d) shows the percentage of observations that are within the common support region separately by treatment status. The common support region lays between the minimum propensity score of a treated and the maximum propensity score of a non-treated individual. Panel (e) shows the percentage of correctly predicted. All calculations use (in addition) SOEP sample weights.

Table 6: Hotelling Balancing Tests

	Men			Women		
	Unmatched	Matched		Unmatched	Matched	
		ATT	ATU		ATT	ATU
Parents	0.003	1.000	1.000	0.000	1.000	1.000
Parents' Character	0.208	1.000	0.999	0.000	1.000	1.000
Parents-Youth	0.686	1.000	0.998	0.012	1.000	0.997
Youth	0.000	1.000	1.000	0.000	1.000	1.000
Annual Dummies	0.098	1.000	1.000	0.040	0.999	0.999

Source: SOEP V29. Note: The table shows the p-values from Hotelling tests of equality of means between the treated and comparison samples. Covariates of the propensity score models are separated into different categories. Category "Parents' character" consists of a subgroup of variables that measures parents' character skills such as Big Five, Locus of Control and Trust. These variables are also included in category "Parents" in addition to parents' earnings and education level. In columns labeled "Unmatched" adolescents are weighted by survey weights provided by the SOEP. In columns labeled "ATT" and "ATU" adolescents are weighted by matching weights calculated in section 3.4.

Table 7: Descriptive Statistics for Key Covariates – SOEP

	Men			Women		
	Have Held a Job?			Have Held a Job?		
	Yes	No	p-Value	Yes	No	p-Value
N	1,452			1,489		
	566	886		562	927	
Parent with University Entrance Qualification	0.275 (0.447)	0.219 (0.414)	**0.016**	0.288 (0.453)	0.182 (0.386)	**0.000**
Parent with Tertiary Education	0.376 (0.485)	0.338 (0.473)	0.183	0.389 (0.488)	0.301 (0.459)	**0.002**
Parental Earnings (1,000 €)	22.888 (15.665)	20.315 (16.581)	**0.004**	22.222 (17.285)	19.877 (14.783)	**0.006**
Father not Employed	0.060 (0.198)	0.103 (0.237)	**0.000**	0.054 (0.181)	0.081 (0.214)	**0.015**
Father Self-Employed	0.074 (0.242)	0.088 (0.258)	0.310	0.095 (0.261)	0.093 (0.269)	0.855
Mother not Employed	0.261 (0.353)	0.329 (0.388)	**0.001**	0.304 (0.373)	0.332 (0.389)	0.185
Mother Self-Employed	0.083 (0.240)	0.048 (0.170)	**0.001**	0.079 (0.231)	0.054 (0.194)	**0.031**
Father's General Trust	0.097 (0.967)	-0.015 (0.956)	**0.060**	0.156 (1.064)	-0.139 (1.010)	**0.000**
Father's Past Trusting Behavior	0.070 (0.941)	-0.063 (1.005)	**0.028**	0.067 (0.979)	-0.018 (1.040)	0.177
Mother's General Trust	0.148 (1.079)	-0.061 (0.964)	**0.000**	0.096 (1.028)	-0.090 (0.952)	**0.001**
Mother's Past Trusting Behavior	0.067 (0.941)	-0.059 (1.028)	**0.026**	0.136 (1.013)	-0.066 (0.989)	**0.000**
Academically Oriented School Track	0.517 (0.500)	0.402 (0.491)	**0.000**	0.585 (0.493)	0.465 (0.499)	**0.000**
Academic School Track Recommendation	0.533 (0.499)	0.382 (0.486)	**0.000**	0.590 (0.492)	0.441 (0.497)	**0.000**
Migration Background	0.186 (0.389)	0.299 (0.458)	**0.000**	0.238 (0.426)	0.318 (0.466)	**0.001**
Sports on Daily Basis	0.306 (0.461)	0.252 (0.435)	**0.031**	0.170 (0.376)	0.122 (0.327)	**0.012**
Formal Extracurricular Activity at School	0.463 (0.499)	0.355 (0.479)	**0.000**	0.538 (0.499)	0.369 (0.483)	**0.000**
Less Formal Extracurr. Activity at School	0.666 (0.472)	0.548 (0.498)	**0.000**	0.756 (0.430)	0.606 (0.489)	**0.000**
East Germany	0.176 (0.381)	0.219 (0.414)	**0.048**	0.158 (0.365)	0.227 (0.419)	**0.001**
Grew Up in City	0.641 (0.480)	0.731 (0.444)	**0.000**	0.658 (0.475)	0.723 (0.448)	**0.008**
Unemployment Rate	10.759 (4.211)	11.175 (4.629)	**0.084**	10.530 (4.494)	11.120 (4.897)	**0.019**

Source: SOEP V29. Columns labeled 'N' show the number of observations with non-missing values of the corresponding variable. Columns labeled 'Yes' and 'No' show the means and standard deviations (in parentheses) of each variable. The column labeled 'p-Value' shows the p-value from a t-test of equality of means. p-values smaller than 0.1 are printed in bold. Calculations use the SOEP sample weights.

Table 8: Descriptive Statistics for Key Covariates – TBS

	Men			Women		
	Hold a Job?			Hold a Job?		
	Yes	No	p-Value	Yes	No	p-Value
N	611			687		
	153	458		147	540	
Parent with University	0.412	0.356	0.216	0.449	0.381	0.138
Entrance Qualification	(0.494)	(0.479)		(0.499)	(0.486)	
Self Employed Parent	0.248	0.186	**0.094**	0.279	0.176	**0.005**
	(0.433)	(0.389)		(0.450)	(0.381)	
Monthly Household Net Income						
Less than € 1500	0.033	0.061	0.178	0.034	0.057	0.260
	(0.178)	(0.240)		(0.182)	(0.233)	
€ 1500 - € 3750	0.346	0.404	0.207	0.320	0.385	0.146
	(0.477)	(0.491)		(0.468)	(0.487)	
More than € 3750	0.621	0.535	**0.064**	0.646	0.557	**0.053**
	(0.487)	(0.499)		(0.480)	(0.497)	
Age	15.719	14.683	**0.000**	16.184	14.770	**0.000**
	(1.583)	(1.495)		(1.490)	(1.549)	
Academically Oriented	0.660	0.526	**0.004**	0.748	0.581	**0.000**
School Track	(0.475)	(0.500)		(0.435)	(0.494)	
East Germany	0.124	0.231	**0.004**	0.102	0.243	**0.000**
	(0.331)	(0.422)		(0.304)	(0.429)	

Source: Time Budget Survey. The column labeled 'p-Value' shows the p-value from a t-test of equality of means. Standard deviations are in parentheses. p-values smaller than 0.1 are printed in bold.

Definition of Activity Categories in Tables 9 to 12

The categories in Tables 9 to 12 are defined as follows. Category "Part-Time Job" denotes time that is spend with job specific activities such as part-time employment, internships, breaks during working time and job search. Category "Learning Activities" covers activities such as attending tutoring sessions and self-learning including internet based learning. "Structured Activities" are defined as activities that take place in an organized setting and/or involve goal-directed efforts. This category includes activities such as athletic involvement, model making, crafting, photographing, volunteering, playing music and painting. Category "Unstructured Activities" covers sedentary activities such as relaxing, reading, watching TV and video, listening to music and activities with peers such as going to cinema, sports events or clubs. Category "School Attendance" shows the amount of time spend in school while category "Housework" covers activities such as preparing meal, cleaning the apartment/house, washing clothes and shopping. Category "Sleep" covers sleep between 9pm and 8am. Category "Eating/Washing/Dressing" includes eating, washing and dressing oneself. Category "Travelling" measures time spend travelling, category "Transit Time" shows how much time they spend being on the way by foot, bus and other means of travel and category "Time diary" shows time spend filling in the time diary.

Table 9: Time Use on a Weekday – TBS

	Men			Women		
	Hold a Job?			Hold a Job?		
	Yes	No	Diff	Yes	No	Diff
N	300	892		285	1053	
Part-Time Job	35.8	13.0	22.8***	26.5	7.1	19.4***
	(96.0)	(67.4)	(5.0)	(81.2)	(50.2)	(3.9)
Learning Activities	48.5	45.1	3.3	62.8	56.4	6.5
	(70.2)	(59.8)	(4.2)	(83.8)	(72.1)	(5.0)
Structured Activities	67.9	64.9	3.0	60.2	55.5	4.7
	(103.4)	(89.7)	(6.2)	(86.4)	(79.3)	(5.4)
Unstructured Activities	347.3	354.0	−6.6	307.5	317.1	−9.5
	(210.4)	(201.2)	(13.6)	(189.3)	(177.7)	(12.0)
School Attendance	219.3	218.8	0.5	208.2	212.9	−4.7
	(165.7)	(157.0)	(10.6)	(158.0)	(158.4)	(10.6)
Housework	39.4	40.1	−0.7	73.6	66.0	7.6
	(57.3)	(62.4)	(4.1)	(83.3)	(73.2)	(5.0)
Sleep	473.3	496.3	−23.1***	457.2	497.6	−40.4***
	(98.7)	(84.8)	(5.9)	(97.4)	(77.4)	(5.5)
Eating/Washing/Dressing	108.2	111.3	−3.1	135.3	127.2	8.1**
	(49.3)	(48.5)	(3.3)	(67.6)	(51.9)	(3.7)
Travelling	1.0	5.0	−4.1*	4.0	4.1	0.0
	(6.9)	(39.4)	(2.3)	(43.4)	(38.3)	(2.6)
Transit Time	94.6	84.5	10.1**	99.9	89.8	10.1**
	(78.4)	(61.8)	(4.4)	(71.0)	(70.2)	(4.7)
Time Diary	3.4	3.8	−0.4	3.5	4.6	−1.2
	(11.0)	(12.0)	(0.8)	(10.6)	(15.2)	(1.0)
Total	1438.5	1436.7	1.7	1438.9	1438.3	0.6
			(1.3)			(0.8)
Not Covered	1.5	3.3		1.1	1.7	

Source: Time Budget Survey. Wave 2001/02. Time allocation in minutes. The table shows time that is spend with main activities. Secondary activities are ignored.

Table 10: Time Use on a Weekend Day – TBS

	Men			Women		
	Hold a Job?			Hold a Job?		
	Yes	No	Diff	Yes	No	Diff
N	158	478		155	564	
Part-Time Job	32.9	8.3	24.6***	32.4	2.6	29.8***
	(82.3)	(56.7)	(5.9)	(91.0)	(27.2)	(4.4)
Learning Activities	37.2	27.1	10.1*	38.6	28.5	10.2*
	(79.2)	(58.9)	(5.9)	(68.5)	(59.0)	(5.5)
Structured Activities	76.9	89.2	−12.3	61.5	86.0	−24.5**
	(112.8)	(120.2)	(10.9)	(101.5)	(123.6)	(10.8)
Unstructured Activities	502.5	490.3	12.2	466.0	447.7	18.3
	(194.3)	(189.9)	(17.5)	(186.8)	(178.3)	(16.3)
School Attendance	4.4	7.1	−2.8	5.2	4.1	1.1
	(28.9)	(44.6)	(3.8)	(39.0)	(33.8)	(3.2)
Housework	46.1	49.1	−3.0	94.1	74.4	19.7**
	(70.1)	(65.2)	(6.1)	(100.5)	(80.9)	(7.8)
Sleep	538.2	564.2	−26.0***	519.0	569.5	−50.5***
	(117.6)	(102.4)	(9.8)	(125.7)	(101.9)	(9.7)
Eating/Washing/Dressing	123.2	128.3	−5.1	146.4	151.3	−4.9
	(68.3)	(65.5)	(6.1)	(60.7)	(66.9)	(6.0)
Travelling	2.9	5.5	−2.6	3.3	4.8	−1.5
	(29.0)	(50.2)	(4.2)	(33.3)	(41.1)	(3.6)
Transit Time	66.6	62.6	4.0	68.6	62.9	5.7
	(76.9)	(81.9)	(7.4)	(70.7)	(72.2)	(6.5)
Time Diary	3.4	3.8	−0.4	3.5	3.8	−0.3
	(12.1)	(15.2)	(1.3)	(10.5)	(12.5)	(1.1)
Total	1434.3	1435.6	−1.3	1438.6	1435.5	3.1
			(2.4)			(2.0)
Not Covered	5.7	4.4		1.4	4.5	

Source: Time Budget Survey. Wave 2001/02. Time allocation in minutes. The table shows time that is spend with main activities. Secondary activities are ignored.

Table 11: Time Use on a Working/Non-Working Weekday Based on the Subset of Adolescents who Work, i.e. Column "Yes" in Table 9 – TBS

	Men			Women		
	Workday?			Workday?		
	Yes	No	Diff	Yes	No	Diff
N	66	234		41	244	
Part-Time Job	162.7	0.0	162.7***	184.4	0.0	184.4***
	(146.5)	(0.0)	(9.5)	(130.1)	(0.0)	(8.3)
Learning Activities	47.3	48.8	−1.5	39.8	66.7	−27.0*
	(61.3)	(72.7)	(9.8)	(59.8)	(86.7)	(14.1)
Structured Activities	53.3	72.0	−18.6	32.9	64.8	−31.9**
	(81.3)	(108.7)	(14.4)	(59.3)	(89.4)	(14.5)
Unstructured Activities	244.8	376.2	−131.4***	232.0	320.2	−88.3***
	(155.7)	(215.0)	(28.4)	(152.6)	(192.1)	(31.6)
School Attendance	203.6	223.7	−20.0	195.9	210.3	−14.5
	(156.6)	(168.3)	(23.1)	(151.9)	(159.3)	(26.7)
Housework	35.9	40.3	−4.4	43.4	78.7	−35.3**
	(52.7)	(58.6)	(8.0)	(48.0)	(86.9)	(13.9)
Sleep	480.2	471.3	8.8	452.0	458.1	−6.1
	(85.1)	(102.3)	(13.8)	(84.2)	(99.6)	(16.5)
Eating/Washing/Dressing	110.0	107.6	2.4	136.3	135.1	1.2
	(53.7)	(48.1)	(6.9)	(56.2)	(69.4)	(11.4)
Travelling	0.3	1.2	−0.9	0.0	4.7	−4.7
	(2.5)	(7.7)	(1.0)	(0.0)	(46.9)	(7.3)
Transit Time	97.6	93.8	3.8	120.2	96.5	23.7**
	(57.7)	(83.4)	(10.9)	(59.7)	(72.3)	(11.9)
Time Diary	3.9	3.2	0.7	3.2	3.5	−0.4
	(13.0)	(10.4)	(1.5)	(7.9)	(11.0)	(1.8)
Total	1439.7	1438.1	1.6	1440.0	1438.7	1.3
			(1.5)			(1.8)
Not Covered	0.3	1.9		0.0	1.3	

Source: Time Budget Survey. Wave 2001/02. Time allocation in minutes. The table shows time that is spend with main activities. Secondary activities are ignored.

Table 12: Time Use on a Working/Non-Working Weekend Day Based on the Subset of Adolescents who Work, i.e. Column "Yes" in Table 10 – TBS

	Men			Women		
	Working Day?			Working Day?		
	Yes	No	Diff	Yes	No	Diff
N	31	127		25	130	
Part-Time Job	167.7	0.0	167.7***	200.8	0.0	200.8***
	(110.0)	(0.0)	(9.7)	(133.8)	(0.0)	(11.6)
Learning Activities	27.7	39.5	−11.8	32.0	39.9	−7.9
	(53.9)	(84.2)	(15.9)	(48.9)	(71.7)	(15.0)
Structured Activities	65.8	79.6	−13.8	53.2	63.1	−9.9
	(119.1)	(111.5)	(22.6)	(90.9)	(103.7)	(22.2)
Unstructured Activities	421.3	522.4	−101.1***	420.0	474.8	−54.8
	(134.1)	(201.8)	(38.2)	(192.7)	(185.1)	(40.7)
School Attendance	2.9	4.7	−1.8	0.0	6.2	−6.2
	(16.2)	(31.3)	(5.8)	(0.0)	(42.5)	(8.5)
Housework	47.4	45.7	1.7	75.2	97.8	−22.6
	(89.9)	(64.7)	(14.1)	(88.4)	(102.6)	(21.9)
Sleep	505.5	546.2	−40.7*	450.4	532.2	−81.8***
	(117.3)	(116.8)	(23.4)	(133.7)	(120.2)	(26.7)
Eating/Washing/Dressing	128.4	122.0	6.4	134.8	148.6	−13.8
	(66.3)	(68.9)	(13.7)	(41.2)	(63.6)	(13.2)
Travelling	0.0	3.6	−3.6	0.0	3.9	−3.9
	(0.0)	(32.4)	(5.8)	(0.0)	(36.3)	(7.3)
Transit Time	66.8	66.5	0.2	69.2	68.5	0.7
	(70.9)	(78.5)	(15.4)	(58.8)	(73.0)	(15.5)
Time Diary	4.2	3.1	1.0	4.4	3.3	1.1
	(12.9)	(11.9)	(2.4)	(12.9)	(10.0)	(2.3)
Total	1437.7	1433.5	4.3	1440.0	1438.3	1.7
			(5.6)			(1.9)
Not Covered	2.3	6.5		0.0	1.7	

Source: Time Budget Survey. Wave 2001/02. Time allocation in minutes. The table shows time that is spend with main activities. Secondary activities are ignored.

Table 13: Locus of Control

	N	Mean	Raw Diff.	ATT	ATU	ATE	OLS
(a) External Locus of control							
Men	1268	−0.020	−0.218**	−0.087	−0.088	−0.087	−0.085
		(1.031)	(0.090)	(0.074)	(0.075)	(0.073)	(0.074)
Women	1262	0.021	0.009	0.002	0.013	0.009	0.012
		(0.967)	(0.084)	(0.076)	(0.080)	(0.072)	(0.075)
(b) Internal Locus of control							
Men	1268	0.022	0.194*	0.180**	0.180**	0.180**	0.187**
		(1.029)	(0.100)	(0.078)	(0.078)	(0.080)	(0.079)
Women	1262	−0.029	0.077	0.116	0.167**	0.147*	0.107
		(0.955)	(0.085)	(0.075)	(0.081)	(0.075)	(0.075)

Source: SOEP V29. Note: All outcome variables are standardized. Calculations use SOEP sample weights. Standard deviations (mean) and standard errors are in parentheses. Standard errors of the treatment effects are bootstrapped with 500 replications and clustered at the family level. *, ** and *** denote significance at the 10%-, 5%- and 1%-level, respectively.

Table 14: Reciprocity

	N	Mean	Raw Diff.	ATT	ATU	ATE	OLS
(a) Negative reciprocity							
Men	903	0.193	0.035	0.068	0.121	0.101	0.067
		(0.991)	(0.106)	(0.085)	(0.089)	(0.084)	(0.087)
Women	904	−0.192	−0.181	−0.068	−0.038	−0.050	−0.076
		(0.973)	(0.113)	(0.085)	(0.086)	(0.085)	(0.086)
(b) Positive reciprocity							
Men	903	−0.035	0.277***	0.175**	0.190**	0.184**	0.169*
		(1.010)	(0.101)	(0.086)	(0.090)	(0.085)	(0.087)
Women	904	0.026	0.148	0.079	0.096	0.090	0.079
		(0.993)	(0.112)	(0.091)	(0.093)	(0.092)	(0.091)

Source: SOEP V29. Note: All outcome variables are standardized. Calculations use SOEP sample weights. Standard deviations (mean) and standard errors are in parentheses. Standard errors of the treatment effects are bootstrapped with 500 replications and clustered at the family level. *, ** and *** denote significance at the 10%-, 5%- and 1%-level, respectively.

Table 15: Future Expectancy

	N	Mean	Raw Diff.	ATT	ATU	ATE	OLS
(a) Successful career							
Men	1350	0.080	0.017	−0.041	−0.041	−0.041	−0.040
		(0.998)	(0.088)	(0.077)	(0.077)	(0.077)	(0.077)
Women	1359	−0.081	0.121	0.064	0.061	0.062	0.066
		(0.999)	(0.077)	(0.072)	(0.074)	(0.071)	(0.072)
(b) Fulfilling career							
Men	1350	0.014	0.038	0.018	0.021	0.020	0.026
		(0.989)	(0.075)	(0.074)	(0.074)	(0.074)	(0.075)
Women	1359	0.007	0.282***	0.165**	0.151**	0.157**	0.160**
		(1.015)	(0.079)	(0.065)	(0.066)	(0.064)	(0.065)
(c) Fulfilling family life							
Men	1350	−0.070	0.063	−0.023	−0.024	−0.024	−0.020
		(1.001)	(0.082)	(0.080)	(0.081)	(0.080)	(0.080)
Women	1359	0.082	0.196**	0.146*	0.136*	0.140*	0.140*
		(1.000)	(0.081)	(0.078)	(0.075)	(0.074)	(0.076)

Source: SOEP V29. Note: All outcome variables are standardized. Calculations use SOEP sample weights. Standard deviations (mean) and standard errors are in parentheses. Standard errors of the treatment effects are bootstrapped with 500 replications and clustered at the family level. *, ** and *** denote significance at the 10%-, 5%- and 1%-level, respectively.

Table 16: Occupational Choice Strategy

	N	Mean	Raw Diff.	ATT	ATU	ATE	OLS
(a) Passive strategy							
Men	1344	−0.022	−0.106	−0.093	−0.089	−0.091	−0.097
		(1.023)	(0.081)	(0.072)	(0.073)	(0.072)	(0.072)
Women	1342	0.027	−0.147**	−0.176***	−0.147**	−0.159**	−0.157**
		(0.974)	(0.072)	(0.065)	(0.065)	(0.064)	(0.065)
(b) Active strategy							
Men	1344	−0.008	0.098	0.117	0.115	0.116	0.117
		(1.001)	(0.078)	(0.072)	(0.072)	(0.072)	(0.072)
Women	1342	0.005	0.145*	0.154**	0.163**	0.160**	0.161**
		(1.001)	(0.079)	(0.070)	(0.068)	(0.068)	(0.068)
(c) Parental dominated strategy							
Men	1344	0.079	−0.196**	−0.124	−0.123	−0.123	−0.130
		(1.027)	(0.086)	(0.080)	(0.081)	(0.081)	(0.081)
Women	1342	−0.105	−0.223***	−0.143**	−0.112*	−0.124*	−0.124*
		(0.956)	(0.071)	(0.065)	(0.066)	(0.065)	(0.066)

Source: SOEP V29. Note: All outcome variables are standardized. Calculations use SOEP sample weights. Standard deviations (mean) and standard errors are in parentheses. Standard errors of the treatment effects are bootstrapped with 500 replications and clustered at the family level. *, ** and *** denote significance at the 10%-, 5%- and 1%-level, respectively.

Table 17: Locus of Control

	CIA^0	CIA^1
(a) External locus of control		
Men	0.200	0.284
Women	0.696	**0.012**
(b) Internal locus of control		
Men	0.463	0.503
Women	**0.034**	0.349

Source: SOEP V29. Note: Table shows p-values of a joint significance test of all instruments.

Table 18: Reciprocity

	CIA^0	CIA^1
(a) Negative reciprocity		
Men	0.145	0.626
Women	**0.049**	0.186
(b) Positive reciprocity		
Men	0.257	0.062
Women	0.199	0.166

Source: SOEP V29. Note: Table shows p-values of a joint significance test of all instruments.

Table 19: Future Expectancy

	CIA^0	CIA^1
(a) Successful career		
Men	0.072	0.299
Women	0.231	0.908
(b) Fulfilling career		
Men	0.389	**0.014**
Women	0.785	0.305
(c) Fulfilling family life		
Men	0.640	0.604
Women	**0.002**	0.109

Source: SOEP V29. Note: Table shows p-values of a joint significance test of all instruments.

Table 20: Occupational Choice Strategy

	CIA^0	CIA^1
(a) Passive strategy		
Men	**0.006**	0.860
Women	0.892	0.429
(b) Active strategy		
Men	0.118	0.713
Women	0.726	0.628
(c) Parental dominated strategy		
Men	**0.035**	0.515
Women	0.074	0.800

Source: SOEP V29. Note: Table shows p-values of a joint significance test of all instruments.

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