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Abstract

This study focuses on the long term effects of unemployment on subjective wellbeing in a family context for 17-24 year old sons living with at least one parent, using data from the German SOEP. As fathers enter unemployment, sons' subjective wellbeing is not only reduced immediately, but also 5 years into the future. As this future reduction remains unexpected by the sons, this suggests even higher true costs of unemployment than previously thought.

JEL classification: Z1, J64, J65, J13

Keywords: Life satisfaction, unemployment, intergenerational transmission, expectations

1 Introduction

The effects of unemployment in a life satisfaction framework have been widely examined in the literature (e.g. Clark, 2003; Lucas, Clark, Georgellis, and Diener, 2004). As Frey and Stutzer (2002) and Ng (1997) argue, subjective well-being is an effective proxy variable for an individual's utility which is used by many economic researchers to assess the impact of economic events on individuals (e.g. Easterlin, 1974; Clark and Oswald, 1996; Senik, 2005).

One of the first and most important studies dealing with the non-pecuniary costs of unemployment is the one by Winkelmann and Winkelmann (1998). In addition to the loss of income (pecuniary costs), the unemployed lose a provider of social relationships, social identity and self-esteem, which leads to a decline in life satisfaction (non-pecuniary costs). Using panel data and controlling for fixed effects they find that unemployment has a significant negative impact on life satisfaction. Furthermore, they point out that the non-pecuniary costs outrun the pecuniary costs by far. Therefore, the costs of unemployment are much larger than estimated without using subjective data.

Kassenboehmer and Haisken-DeNew (2009) distinguish between voluntary and involuntary unemployment. Being fired is treated as partly involuntary, while unemployment due to company closure within the last twelve months is regarded as completely involuntary. They take involuntary unemployment as being totally exogenous. Therefore, the causal impact of involuntary unemployment is not biased by an endogenous transition into unemployment. Their major finding is that if the reason for becoming unemployed is company closure, the decrease in well-being is significantly larger compared to being fired. They conclude that it is important to control for the specific reason for entry into unemployment in order to understand the underlying story.

In addition it is found that unemployment also harms in an intergenerational context, as in Kind and Haisken-DeNew (2012) or Pedersen and Madsen (2002). Not only the individual him-/herself experiences a decrease in life satisfaction, but children suffer as well. Pedersen and Madsen (2002) examine the effects of parental employment status on children's health and well-being.[1] In their opinion, children are highly sensitive to their parents' well-being, leading to the hypothesis, that if parental unemployment affects subjective well-being, it should impair children's well-being as well. They find that parental unemployment in the past six months decreases children's health status and well-being. Though the results of the study are questionable due to the structure of the data. Children's well-being was reported by the parents. As mentioned before, unemployment has a significant negative effect on the individual him-/herself. If the parent is already dissatisfied with life, it seems reasonable to hypothesize, that this could influence the report of the life satisfaction of others. Therefore children's well-being might be biased downward by reduction in parental well-being due to parental unemployment.

[1] Pedersen and Madsen (2002) focus on children who are between two and 17 years old.

Kind and Haisken-DeNew (2012) overcome the downward bias present in the study of Pedersen and Madsen (2002) by using only self-reported subjective well-being (SWB). The authors use panel data from the SOEP and control for the specific reason of parental entry into unemployment.[2] They assess cross-effects as well as same-gender effects for 17-25 year old sons and daughters living with at least one parent. As a result, they find no significant effects of parental entry into unemployment on daughters' life satisfaction. However, there are indeed effects for sons. The father becoming exogenously unemployed decreases the son's life satisfaction as well as endogenous entry into unemployment of the mother. If the mother becomes unemployed by resigning, the son's well-being is negatively affected. If the father becomes dismissed, the son's life satisfaction increases. They conclude that parental exogenous entry into unemployment bears higher costs than previously assumed, due to intergenerational transmission.

The estimation of the costs of unemployment is always done for the short run. By examining the effect of parental entry into unemployment in time t on children's well-being in time t, one focuses on the immediate costs of entry into unemployment. The present paper addresses the question whether long run intergenerational effects of unemployment on well-being exist and whether these effects are expected by the children. Intergenerational transmission of real labor market outcomes is shown to be present, as in O'Neill and Sweetman (1998), Hérault and Kalb (2009) or Chevalier (2002). Children's labor market outcomes are negatively affected if a parent experiences unemployment. Assuming rationality, these children should be aware of the disadvantage concerning their future. If they correctly anticipate it, they should take up actions to prevent their disadvantage to be realized. However, as real outcomes are negatively affected, it is hypothesized that the children are not aware of the intergenerational transmission.

This study estimates the effect of parental unemployment in t on expected life satisfaction in t for $t + 5$ and on realized life satisfaction in $t + 5$. There are only a few studies using expected life satisfaction measures. Loewenstein and Schkade (1997) present an overview of several studies dealing with the prediction of future feelings. They show that errors in predicting future feelings occur and claim that these errors are due to incorrect intuitive theories, biased memory of experience and too few repetitions of events. Other studies such as Kahneman, Wakker, and Sarin (1997), Easterlin (2001), Frey and Stutzer (2004), Loewenstein, O'Donoghue, and Rabin (2003) also provide evidence for the existence of forecast errors.

Schwandt (2009) tests the rational expectation hypothesis. He regresses the deviation of expected life satisfaction from its realization on a set of control variables. Using the SOEP as a rich data set, he calculates 136,000 individual forecast errors. As a result, he finds that young people tend to overpredict

[2]See also the paper by Kassenboehmer and Haisken-DeNew (2009) who use company closure for identification.

their future life satisfaction whereas the elderly systematically underpredict. In addition, the recent level of life satisfaction also has an impact on the direction of misprediction. He concludes that the misprediction of future life satisfaction disagrees with the rational expectation hypothesis assumed in economics.

Another study that uses expected life satisfaction in order to estimate forecast errors is the one by Frijters, Greenwell, Haisken-DeNew, and Shields (2009). They compare the different expectations of East and West Germans after reunification. Treating reunification as an exogenous shock for all Germans, the authors are able to show different paths of adaption for East and West Germans. East Germans significantly overestimated the satisfaction gains from reunification. Furthermore, the authors find that age and education significantly affect forecast errors.

This study is the first to examine the effect of fathers' entry into unemployment on sons' expected and realized future life satisfaction. Using panel data from the German Socio-Economic Panel (SOEP) for the years 1991 to 2009, effects on 17-24 year old sons living with at least one parent are assessed using a linear fixed effects within estimator. This age group is of special interest since these are sons who are at the beginning of their careers. Specifically in this age group, parental entry into unemployment should have an effect since sons regard their parents as a benchmark for their own labor market success. Thus, parental unemployment should be regarded when the children form their expectations.

Parental unemployment can be treated as exogenous for the child, since an (almost) adult child does not influence the parental decision to work. As such, it allows identifying the causal effect of the entry into unemployment of the father. Using panel data from the SOEP, it is possible to ensure the exogeneity for the child even further. As the parent states the specific reason for entry into unemployment, one is able to control for exogenous reasons from a parental perspective. Therefore, parental involuntary entry into unemployment can be regarded as exogenous for the child.

Building on Kassenboehmer and Haisken-DeNew (2009), this paper addresses the extent to which the negative effects of unemployment are transmitted from father to son within the family as in Kind and Haisken-DeNew (2012) and (a) whether this effect is only merely contemporaneous and/or long-lasting and (b) whether a potential negative impact on the future is correctly anticipated by the sons five years into the future.

This study shows that the son's expectation of future life satisfaction is not affected by parental entry into unemployment. It is concluded that sons suffer today, but (falsely) expect this to vanish in the future. However, negative effects of paternal entry into unemployment can be detected even five years later. As a result, the sons underestimate the long run true costs of father's economic inactivity. This suggests that the true costs of unemployment go beyond any immediate effects for the specific person entering into unemployment and extend to additional household members. Children who just entered or are about to

enter the labor market are affected, not just contemporaneously, but also as many as five years into the future.

2 Data and Empirical Application

The data used is extracted using PanelWhiz[3] from the German Socio-Economic Panel (SOEP). It contains survey data which is asked on a yearly base since 1984. The sample for this analysis is an unbalanced panel restricted to 17-24 year old sons living with at least one parent in the years 1991 to 2009. It contains 3,025 person-year observations (1,130 individuals). Further detailed information on the German SOEP can be found in Haisken-DeNew and Frick (2005).

The sons are 17 years old and older because this is the first time they personally participate in the survey.[4] It is focused on dependent children living at home, potentially entering the labor market for the first time and thus an upper age bound of 24 years is chosen.[5] It is reasonable to assume that after the age of 24 the labor market status of the father is not as relevant for the child's own labor market decisions, as in earlier ages. Several robustness checks were run changing the upper bound.[6] For the son to be in the sample, he has to live with at least one parent at the time the father becomes unemployed. This ensures that the son experiences "first hand" his father's entry into unemployment. Living together with at least one parent also reflects the son's economic dependence on his parents. Due to spatial proximity, the son observes how his father deals with unemployment.[7] Only sons and fathers are included because of the very low number of observations for daughters having mothers who experience unemployment.[8]

Three potential effects are of interest: First, the effect of father's entry into unemployment in t on the son's realized life satisfaction in $t + 5$. Second, the effect of father's entry into unemployment on the son's expected life satisfaction for $t+5$ as measured in t. Finally, the effect of father's entry into unemployment on the son's forecast error in period t.

[3]The data used in this paper was extracted using the Add-On Package PanelWhiz for Stata. PanelWhiz (http://www.PanelWhiz.eu) was written by Prof. Dr. John P. Haisken-DeNew (john@PanelWhiz.eu). See Haisken-DeNew and Hahn (2010) for details. The PanelWhiz generated DO file to retrieve the data used here is available upon request. Any data or computational errors in this paper are the authors'.

[4]This restriction avoids the potential downward bias of the study of Pedersen and Madsen (2002).

[5]Schimpl-Neimanns (2006) found that the average age of leaving the parent's household is 21 for men.

[6]Steadily increasing the upper bound of the children's age did not change the results until the age of 30, when the coefficients rendered insignificant.

[7]While the son has to live with at least one parent when the father becomes unemployed, there is no restriction on the son's place of living afterwards.

[8]In Kind and Haisken-DeNew (2012) no statistically significant immediate effect of parental unemployment on daughters is found.

The SOEP provides self-reported measures for realized and expected life satisfaction. The question regarding the realized life satisfaction is asked at the end of the survey and is formulated as:

"*How satisfied are you with your life, all things considered?*"

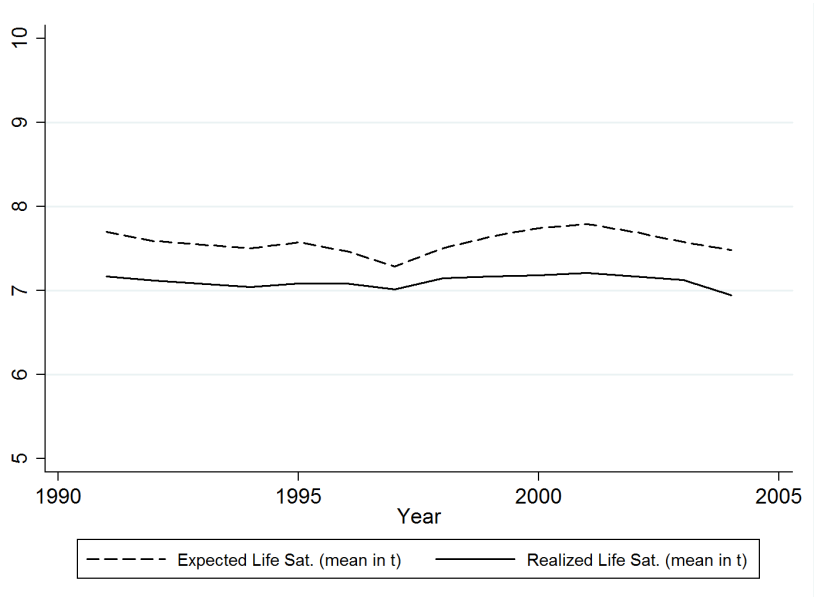
Individuals answer on an eleven-point scale from zero meaning "completely dissatisfied" to ten meaning "completely satisfied". Directly after this question, the individuals are asked about their expectation of their life satisfaction in five years with the following question[9]:

"*And how do you think you will feel in five years?*"

Individuals report their expected satisfaction on the same eleven-point scale. Using these two questions, the forecast error is calculated in the following manner:

$$\text{Forecast error}_t = \text{Expected life satisfaction}_{(t+5|t)} - \text{Realized life satisfaction}_{t+5}$$

Figure 1: Deviation of Expected Life Satisfaction for $t+5$ in t and Realized Life Satisfaction in t



Source: Calculations using the SOEP (1991-2009).

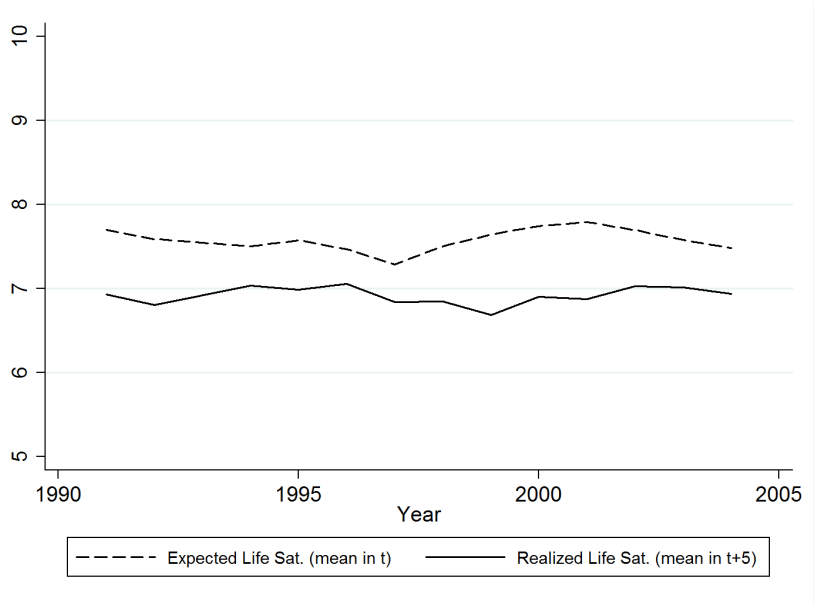
As shown in Figure 1, the average levels of sons' expected life satisfaction and today's life satisfaction are not identical. Indeed they differ in about 47% of

[9]Before 1998 the question was "How happy do you think you will be in five years from now?".

the cases. However, the raw correlation between expected life satisfaction and today's life satisfaction is 0.594 and statistically significant different from zero.

In Figure 2 the difference between the expected life satisfaction and its realization five years later can be seen. On average, sons overestimate their future life satisfaction. The mean forecast error is about 0.73 points on the eleven-point scale and significantly different from zero at the one percent level.

Figure 2: Deviation of Expected Life Satisfaction for $t + 5$ in t and Realized Life Satisfaction in $t + 5$



Source: Calculations using the SOEP (1991-2009).

The standard controls are: age of the child (also as a quadratic), number of nights the child stayed at the hospital this year, education of the child, logarithm of equivalence household income, lives with both parents, regional unemployment rate as well as unemployment status of the child. Health is assumed to have an impact on the child's life satisfaction as Locker, Clarke, and Payne (2000) show for adults. As a proxy for the individual's health status, the number of nights stayed in a hospital is used. Self-reported health status might be biased due to endogeneity with SWB and is therefore not included in the estimations. Household equivalent income is measured in logged form, standard in the SWB literature, with observations below EUR 200/month being dropped as data outliers. Two dummy variables are included for the type of achieved secondary school diploma: (a) medium level of education (intermediate or technical school degree) and (b) high level of education (upper secondary school degree). Another dummy variable indicates whether the child lives together with both parents in the same household. If the son is 17 and older, it is appropriate to allow for the possibility that the child himself is unemployed and thus a dummy variable for the son's own unemployment is included. Unem-

ployment is assumed if the labor force status of the individual is unemployed, non-working but sometimes secondary job, non-working but worked in past seven days and non-working but regular secondary job. Descriptive statistics for the sample are displayed in Table 1.

Two different specifications are used. In a first step, a dummy variable is included that reflects whether the father becomes unemployed in the current period in order to measure the entry-year effect on the child's life satisfaction. Here the reason of unemployment is explicitly not controlled for.

The following realization of life satisfaction in $t+5$ (LS_{it}^{t+5}) is estimated using OLS with person fixed effects (α_i), as a function of personal characteristics (X_{it}), father's entry into unemployment ($FBUE_{it}$) and the forward-looking expectation of life satisfaction for $t+5$, but surveyed at time t ($LS_{it}^{t+5|t}$):

$$LS_{it}^{t+5} = \alpha_0 + \alpha_i + \beta X_{it} + \delta^{UE} FBUE_{it} + \gamma LS_{it}^{t+5|t} + \varepsilon_{it} \tag{1}$$

followed by the estimation of the forward-looking expectation for $t+5$, but taken at time t ($LS_{it}^{t+5|t}$) as a dependent variable:

$$LS_{it}^{t+5|t} = \alpha_0 + \alpha_i + \beta X_{it} + \delta^{UE} FBUE_{it} + \varepsilon_{it} \tag{2}$$

followed by the explicit estimation of the forecast error, the difference between the expectation at t for $t+5$ and the realization for $t+5$:

$$PredError_{it} = LS_{it}^{t+5|t} - LS_{it}^{t+5} = \alpha_0 + \alpha_i + \beta X_{it} + \delta^{UE} FBUE_{it} + \varepsilon_{it} \tag{3}$$

In a second step, $FBUE_{it}$ "father became unemployed this period" in the previous three equations, is decomposed by reason for entry into unemployment: (a) clearly exogenous reasons $FBUE_{it}^{Exog}$ such as company closure by δ^{Exog} and (b) other and potentially endogenous reasons $FBUE_{it}^{Endog}$ such as simply being fired by δ^{Endog}.

Controlling for the specific reason for entry into unemployment,[10] the relevant question of the SOEP is:

"*How was this job terminated?*"

The possible answers include (a) Because your place of work or office has closed, (b) own resignation, (c) dismissal, (d) mutual agreement, (e) temporary job or apprenticeship completed, (f) reaching retirement age/ pension, (g) suspension and (h) entering into self-employment/ business. Here "Because your place of work or office has closed" is taken as exogenous to the father. The underlying assumption is that the father himself cannot influence the closure of the company. All other reasons are regarded as endogenous to the father.

[10] Kassenboehmer and Haisken-DeNew (2009) use the exogenous reason for entry into unemployment to identify the causal impact of unemployment on SWB.

The equations are estimated using a linear fixed effects within estimator with robust standard errors. As life satisfaction is a subjective measure, it is absolutely critical to control for unobservables: time invariant unobservable factors that affect the reported life satisfaction and the standard controls (e.g. optimism) would bias the results if not controlled for, necessitating a fixed effects estimator. While the dependent variable is a discrete variable (eleven-point scale), a fixed effects estimator assumes that the dependent variable is continuous and cardinal. However as Ferrer-i Carbonell and Frijters (2004) point out, treating life satisfaction as nearly continuous and cardinal is an acceptable approximation to make.[11]

3 Results

Table 2 shows the results for the first step. Here solely the event of the father becoming unemployed (regardless of reason) is controlled for.[12] The child being unemployed in t has a negative effect on the expected life satisfaction for $t+5$. As the realized life satisfaction in $t+5$ is not affected by the son being unemployed in t, this leads to an underestimation of life satisfaction. This result shows that the son's own unemployment not only decreases life satisfaction now[13] but also has a negative effect on his expectations of future life satisfaction.

Regarding the variable of interest, the sons suffer from the father's entry into unemployment in $t+5$. The father entering unemployment in t results in a 0.275 point lower reported life satisfaction on the eleven-point scale in $t+5$. However, sons do **not** expect this, leading to an underestimation of the true costs of fathers' unemployment. A father becoming unemployed in t has no significant effect on the son's expected life satisfaction. The sons suffer in the long term but are not aware of this at time t and do not adjust their expectations. As a result, the sons overestimate their life satisfaction in $t+5$ by 0.433 points on the eleven-point scale.

In Table 3, the results for the second step are presented, differentiating between the reasons for the father's entry into unemployment. Exogenous entry into unemployment is identified by company closure and is not only an exogenous reason for unemployment from the father's perspective but also "double" exogenous for the son. As Kind and Haisken-DeNew (2012) show, a father becoming exogenously unemployed today decreases life satisfaction of the son in time t. Table 3 shows, that sons do not only suffer today (in t), but also in the future ($t+5$). However, the sons even expect their life satisfaction to increase. The consequences of father's exogenous entry into unemployment are a decrease in life satisfaction in t and in $t+5$, but sons still expect an increase in their life satisfaction. As a result, they underestimate the true impact of father's entry into unemployment. They expect their life satisfaction to be about 1.5 points

[11] E.g. see Oswald (1997) and Frijters, Greenwell, Haisken-DeNew, and Shields (2009).
[12] All tables are created using the command esttab by Jann (2007).
[13] A result of Kind and Haisken-DeNew (2012).

higher in $t + 5$ as it actually will be.

The other variable of interest is the father's entry into unemployment due to endogenous reasons. Examining the coefficients, it can be seen that there is a negative effect on the realized life satisfaction in $t + 5$ and a positive effect on the expectation. However, from a son's perspective, the father becoming endogenously unemployed has no statistically significant long run effects. In addition, it can be seen that the coefficient for the forecast error is not significant but positive, indicating that the sons incorrectly keep their future expectations overly high, when they should be correcting them downwards.

4 Conclusion

Involuntary unemployment is a harmful event from an individual perspective. This study focuses on how the negative impacts of parental unemployment transfer between generations. Do sons suffer from fathers' entry into unemployment in the long run? And once the young adults start their own careers, does the unemployment of the father affect the current expectations of their future?

This study is the first to capture long run costs of parental unemployment on realized and expected life satisfaction of sons of fathers experiencing unemployment. Using panel data from the German SOEP, effects on future realized satisfaction as well as expected life satisfaction are examined. Focusing on 17-24 year old sons living with at least one parent, the effects of father's entry into unemployment are found to be significant, negative and long-term in nature.

Using a linear fixed effects within estimator, this study demonstrates that if the father enters unemployment, effects on future realized well-being of the son can be detected but not on expected future life satisfaction. If the father becomes unemployed in t, the son's life satisfaction not only decreases in t but also in $t + 5$. However the son does not correctly anticipate this and the son's future expectation is not adjusted, leading to an underestimation of the true costs of father's entry into unemployment. The father, entering unemployment due to company closure, decreases son's life satisfaction five years later. However, the son expects his life satisfaction to increase. As a result, the forecast error following a job loss of the father due to company closure is even higher. Endogenous reasons for entering unemployment have no impact on the son's well-being in $t+5$. In addition, father's endogenous entry into unemployment does not affect expectations and does not result in additional forecast error.

Thus, exogenous entry into unemployment scars not only in a primary manner (confirming Winkelmann and Winkelmann, 1998; Kassenboehmer and Haisken-DeNew, 2009) but also spreads throughout the family (expanding further on Kind and Haisken-DeNew, 2012; Pedersen and Madsen, 2002) and more importantly, even as long as five years into the future. As the sons are at the

beginning of their careers, this unexpected negative impact is of particular importance. The point estimates of the harm caused by the father's entry into unemployment are at least as large as the son's own entry into unemployment. Rigidities in continental European labor markets, such as high levels of long and short-term unemployment due to sticky wages, have far-reaching welfare consequences not only for the people entering unemployment and their children, but for many periods into the future and in an unexpected manner. As long as wages remain rigid, and the market clearing mechanism continues to be through unemployment, far-reaching and long-term negative welfare consequences will remain important. Policy makers must finally address the true costs of unemployment and focus on methods to liberalize labor markets with more wage adjustments to demand fluctuations.

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Table 1: Descriptive Statistics

	Mean	Std.Dev.	Min.	Max.
Realized life satisfaction in 5 years	6.936	1.651	0	10
Expected life satisfaction in 5 years	7.682	1.596	0	10
Forecast error	0.746	1.991	-8	10
Age	20.518	2.079	17	24
Age^2	425.309	85.505	289	576
Number of nights in hospital	0.725	5.771	0	180
Level education middle	0.440	0.496	0	1
Level education high	0.201	0.401	0	1
Live together with both parents	0.962	0.192	0	1
Log equivalence household income	7.170	0.417	4.9	9.1
Unemployed (child)	0.172	0.378	0	1
Regional unemployment rate	11.485	4.962	3.7	22.1
Becomes unemployed this period (father)	0.029	0.169	0	1
Becomes exogenously unemployed (father)	0.004	0.060	0	1
Becomes endogenously unemployed (father)	0.025	0.158	0	1
N	3025			

Table 2: Son's Life Satisfaction when Father Becomes Unemployed

	Realization *(t+5)*	Expectation *(t+5|t)*	Forecast error *(t+5|t)-(t+5)*
Age	-0.219	-0.199	0.011
	(0.288)	(0.289)	(0.451)
Age^2	0.004	0.004	0.000
	(0.007)	(0.007)	(0.011)
Number of nights in hospital	0.003	-0.008*	-0.011
	(0.005)	(0.004)	(0.007)
Level education middle	-0.531*	0.251	0.794**
	(0.284)	(0.214)	(0.354)
Level education high	-0.298	0.230	0.539
	(0.333)	(0.248)	(0.427)
Live together with both parents	-0.665	0.227	0.902*
	(0.689)	(0.245)	(0.501)
Log equivalence household income	-0.161	-0.157	-0.004
	(0.149)	(0.159)	(0.232)
Unemployed (child)	-0.023	-0.287***	-0.278**
	(0.078)	(0.095)	(0.120)
Regional unemployment rate	0.021	-0.076***	-0.100***
	(0.023)	(0.024)	(0.037)
Becomes unemployed this period (father)	-0.275**	0.152	0.433*
	(0.140)	(0.201)	(0.232)
Expected life satisfaction in 5 years	-0.046*		
	(0.025)		
Constant	11.869***	11.626***	0.293
	(3.144)	(3.089)	(4.804)
N	3025	3025	3025
R^2	0.015	0.024	0.017

Note: * p<.10, ** p<.05, *** p<.01. Robust standard errors in parantheses.
Estimations are done using a Fixed Effects Linear Panel Model

Table 3: Son's Life Satisfaction when Father Becomes Unemployed: By Entry

	Realization *(t+5)*	Expectation *(t+5—t)*	Forecast error *(t+5—t)-(t+5)*
Age	-0.207	-0.212	-0.015
	(0.289)	(0.287)	(0.449)
Age^2	0.004	0.005	0.001
	(0.007)	(0.007)	(0.011)
Number of nights in hospital	0.003	-0.007*	-0.011
	(0.006)	(0.004)	(0.008)
Level education middle	-0.530*	0.250	0.792**
	(0.284)	(0.214)	(0.354)
Level education high	-0.302	0.234	0.546
	(0.333)	(0.248)	(0.427)
Live together with both parents	-0.658	0.219	0.887*
	(0.685)	(0.251)	(0.496)
Log equivalence household income	-0.164	-0.154	0.004
	(0.149)	(0.159)	(0.232)
Unemployed (child)	-0.027	-0.283***	-0.268**
	(0.078)	(0.095)	(0.120)
Regional unemployment rate	0.020	-0.075***	-0.099***
	(0.024)	(0.024)	(0.038)
Becomes exogenously unemployed (father)	-0.784**	0.669*	1.484***
	(0.398)	(0.350)	(0.563)
Becomes endogenously unemployed (father)	-0.204	0.065	0.272
	(0.148)	(0.225)	(0.248)
Expected life satisfaction in 5 years	-0.045*		
	(0.025)		
Constant	11.756***	11.740***	0.516
	(3.148)	(3.076)	(4.790)
N	3025	3025	3025
R^2	0.016	0.025	0.018

Note: * p<.10, ** p<.05, *** p<.01. Robust standard errors in parantheses.
Estimations are done using a Fixed Effects Linear Panel Model