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Life satisfaction and endogenous aspirations

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Life Satisfaction and Endogenous Aspirations

Marco Bertoni and Luca Corazzini

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Life Satisfaction and Endogenous Aspirations

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Abstract

Using data from the German Socio-Economic Panel (N = 13,145), we investigate the effects of (not) achieving aspirations on subjective well-being. We match individual-level data about life satisfaction aspirations with their subsequent realizations and we jointly estimate two panel-data equations, the first depicting the effects that (not) achieving initial aspirations exerts on the subsequent level of life satisfaction, and the second describing the endogenous adjustment process followed by aspirations as a function of beaten and unmet targets. We find that while achieving aspirations exerts weak effects on life satisfaction, failing to match aspired conditions significantly reduces subsequent realizations of life satisfaction. Moreover, our analysis supports a “hedonic adaptation” explanation of the previous results, as we find that aspirations significantly adjust to beaten targets, while they remain almost unchanged in case of unmet targets.

PsycINFO: 2900, 2910, 2240.

JEL classification: C99, C83, I31.

Keywords: Aspirations, Affective forecasts, Life Satisfaction, Hedonic Adaptation.

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“The less you expect, the more you’ll be pleased”

Lyrics from the song “Less”, Ben Harper, 1995.

1 Introduction

Aspirations do matter in life. As envisaged by social scientists, they represent a reference according to which individuals evaluate their economic, social and psychological conditions, and make important prospective decisions. Indeed, by modifying how experiences are framed and contextualized, aspirations are a powerful driver of well-being, and becoming aware of the discrepancy between what an individual achieved and her initial aspirations may exert strong psychological effects, that are likely to result in revisions of her life plans. Lyubomirsky (2011) cites as an anecdotal example the case of Michael Jackson: after *Thriller* became the biggest-selling album of all time, he declared wanting his next album to sell twice as much. Similarly, Sen (1985a and 1985b) argues that the experience of negative conditions may push individuals to accommodate their desires to contextual constraints, thereby “deforming” their aspirations in response to realized life events.

While there are contributions postulating that the difference between achievements and aspirations affects individuals subjective well-being (Campbell, 1976; Mason and Faulkenberry, 1977, Michalos, 1980), little has been done to qualify and empirically quantify such a psychological effect. As pointed out by Wilson and Gilbert (2003), “most of the early work (...) measured peoples forecast but not their actual emotional response” (p.346).

The aim of our contribution is to empirically investigate the effects that (not) achieving aspirations about future well-being *per se* exerts on the actual level of self-reported life satisfaction, after controlling for a number of characteristics of the respondents. Our analysis is based on the German Socio-Economic Panel (SOEP, see Wagner et al., 2007), a unique dataset about the German population collecting longitudinal information on respondents’ characteristics, their aspirations about future life satisfaction (or “affective forecasts” - see Wilson and Gilbert, 2003) and the subsequent life satisfaction realizations, that can thus be matched. This rich dataset allows us to address three relevant issues that, if not properly addressed, might limit the validity of the results.

First, aspirations are not fixed, rather, they represent an endogenous reference that adjusts over time to life events, to smooth out quickly the psychological responses to achievements or failures.¹ In this perspective, scholars refer to “hedonic adaptation” as

¹Economists talk about reference-dependent preferences: the utility of a choice depends on the comparison between the corresponding outcome and the reference which, in turn, is determined endogenously. Köszegi and Rabin (2006) assume that an individual’s reference point coincides with her

the “processes that attenuate the long-term emotional or hedonic impact of favorable and unfavorable circumstances” (Frederick and Loewenstein, 1999, p.302). In discussing the “aspirations treadmill”, Kahneman and Kruger (2006) postulate that “if people gradually adjust their aspirations to the utility that they normally experience, an improvement of life circumstances would eventually lead them to report no higher life satisfaction than they did before, even if they were experiencing higher utility than previously” (p.16).² In our context, not accounting for the co-movement of the actual level of subjective well-being and the aspired target may lead to misleading and biased assessments about the net effect of (not) achieving aspirations. We address this issue by allowing a dynamic interplay between aspiration formation and life satisfaction. In particular, we jointly estimate two panel-data equations, the first depicting the effects of (not) achieving initial aspirations on the actual level of life satisfaction and the second describing the adjustment process followed by aspirations over time in response to realized failures and successes.

Second, both the magnitude of the psychological response and the speed at which endogenous aspirations adjust over time may depend on the sign (positive or negative) of the discrepancy between actual conditions and aspirations. On the one hand, there is robust evidence suggesting that individuals are loss averse: for given size of a shock, the loss in well-being registered when the shock is negative is greater than the gain in well-being when the shock is positive. On the other hand, supporters of hedonic adaptation have provided robust evidence showing that individuals (and their reference) adapt faster to improved conditions than to unfavorable circumstances (Arkes et al., 2008 and 2010; Lyubomirsky, 2011). In our context, these considerations suggest that unmet aspirations (i.e. the level of life satisfaction achieved by the individual falls below her own aspirations) should exert stronger and more persistent effects on well-being levels than beating aspirations (i.e. the level of life satisfaction achieved by the individual overcomes her own aspirations). Moreover, the channel by which this differential effect takes place should be that beating aspirations shifts upwards the reference point adopted by individuals, while the converse should not hold true - at least in the short run. In this respect, our empirical approach allows us to separately identify the effects of beaten and unmet aspirations on life satisfaction, as well as to highlight existing asymmetries in the adjustment process of aspirations.

Third, using self-reported measures of well-being raises some additional methodological issues, mainly related to the effects of unobserved individual heterogeneity on empirical results. The longitudinal structure of our dataset allows us to use individ-

equilibrium rational expectations about outcomes.

²In this vein, Easterlin (2001) posits that an increase in income leads to small and transitory improvements of life satisfaction, because income aspirations move in parallel with income levels.

ual fixed effects to control for differences in reporting style across respondents (Holland and Wainer, 1993; Angelini et al., 2014) as well as unobserved time-invariant individual traits.

We depart from the existing literature in the concept of “aspirations” used in the analysis. While most of the existing literature studies the relationship between income aspirations and subjective well-being (Easterlin 2001; Das and Van Soest 1997 and 1999; Stutzer, 2004; Senik, 2008; Frijters et al. 2012; Boyce et al., 2013), our analysis compares *aspirations* and *subsequent matched realizations* of life satisfaction, and investigates how the discrepancy between these two affects the consequent life satisfaction realizations and aspirations. Indeed, we share the fundamental idea that “money is not enough to make people happy” and that, in addition to economic dimensions, non-economic factors and well-being aspirations play a crucial role in determining both the actual level of life satisfaction and subsequent targets (Frey and Stutzer, 2002a, 2002b; van Praag and Ferrer-i-Carbonell, 2007; Bruni and Porta, 2005; Dolan et al., 2008).

Three previous examples look at determinants of the mis-match between expectations and realizations of life satisfaction using the SOEP. One is Frijters et al. (2009), who show that east Germans overshoot their happiness expectations about the 1989 German unification. The second is Abolhassani and Alessie (2013), who show that unemployed individuals expect to be less satisfied with life than they will actually be in the future, while the same does not hold for retirees. Finally, Schwandt (2013), shows that the observed U-shaped age profile of life satisfaction can be explained by unmet aspirations: as people age, unmet aspirations drive life satisfaction down because people fail to meet the high aspirations set in youth. People then abandon high aspirations, and get happier in the second part of the life course.

We contribute to this literature by jointly analyzing how beaten and unmet targets affect the realizations of life satisfaction and the dynamics of aspirations. This allows us to shed novel light on the mechanics of hedonic adaptation, as well as on the determinants of the reference points against which people benchmark situations to form happiness judgements.

2 Methods

2.1 Data and measures

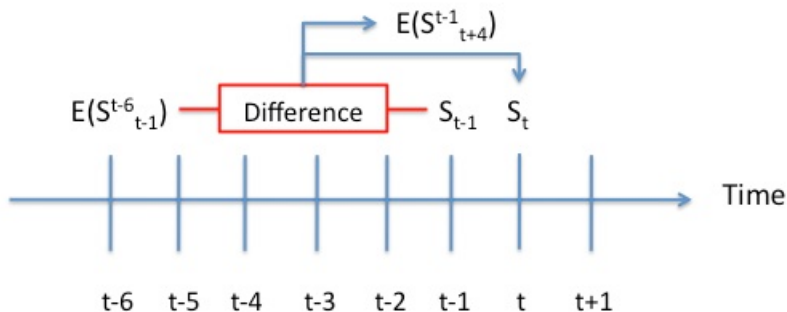
The SOEP is a representative annual panel survey of the German population, interviewing every year around 7,000 households (13,000 individuals). It started in 1984 in West Germany and in 1990, after German re-unification, in East Germany. The SOEP collects a wealth of information about subjective well-being: individuals are asked every

year about their current satisfaction with many life domains (health, income, leisure, ...) and about satisfaction with life in general.³

The unique feature of this dataset is that, from 1992 until 2004, individuals were also asked about their expected life satisfaction in five years time.⁴ Hence, as previously done by Frijters et al. (2009), Abolhassani and Alessie (2013) and Schwandt (2013), we can match data for life satisfaction in year t with data on aspirations about life satisfaction in year t expressed in year $t - 5$, for each year t from 1997 until 2009 and for each individual that is present in both periods. By computing the difference between aspirations and realizations we can understand whether each individual's current life satisfaction is below, in line with, or above the level he or she was aspiring to five years before.

Let the level of life satisfaction at period t be S_t , and let life satisfaction aspirations for period t expressed in period $t - 5$ be $E[S_t^{t-5}]$. We consider individual life satisfaction aspirations to be unmet, met, or beaten if $S_t < E[S_t^{t-5}]$, $S_t = E[S_t^{t-5}]$, or $S_t > E[S_t^{t-5}]$, respectively. Given our data, we are going to evaluate the effect of a positive or a negative difference between S_{t-1} and $E[S_{t-1}^{t-6}]$, our treatment variables, on the subsequent life satisfaction realization, S_t , and on $E[S_{t+4}^{t-1}]$, the life satisfaction aspirations expressed at time $t - 1$. As a consequence, we consider only individuals for whom we observe S_t , $E[S_{t+4}^{t-1}]$, S_{t-1} , and $E[S_{t-1}^{t-6}]$, restricting our sample to years 1998-2005. The timing of our analysis is reported in Figure 1.

Figure 1: Timing of the analysis



³More precisely, our analysis is based on the Socio-Economic Panel (SOEP), data for years 1984-2012, version 29, SOEP, 2013, doi: 10.5684/soep.v29.

⁴The exact wording of the questions in English is as follows: How satisfied are you at present with your life as a whole? How satisfied do you think you will be five years from now? Individuals were asked to report their answer according to a 0-10 scale, where 0 means 'completely dissatisfied' and 10 means 'completely satisfied'.

We also make use of information on age, that enters in our model as a quadratic, interview year dummies,⁵ a variable counting the number of evaluations of life satisfaction expressed until any given year that we call “evaluation experience”, to control for learning effects, employment status, civil status, number of children, objective health indicators (number of doctor visits and any overnight hospital stay in the previous year) and net household income. Considering individuals living in both East and West Germany with non-missing values of the abovementioned covariates, we end up with a sample of 70,649 individual-year observations for 13,145 individuals. Descriptive statistics for our data are shown in Table 1.

Table 1: Descriptive Statistics - Full sample: N = 70,649

	Mean	Standard Deviation	Min	Max
S_t	6.740	1.771	0	10
S_{t-1}	6.774	1.743	0	10
$E[S_{t+4}^{t-1}]$	6.771	1.946	0	10
Beaten	0.315	0.465	0	1
Unmet	0.430	0.495	0	1
$E[S_{t-1}^{t-6}] - S_{t-1}$	-0.231	2.004	-10	10
Age	48	15.590	20	99
Year	2002	2.298	1998	2005
Evaluation experience	3.940	2.237	1	8
Employed full time	0.451	0.498	0	1
Employed part time	0.094	0.292	0	1
Married	0.700	0.458	0	1
Divorced	0.083	0.276	0	1
Widowed	0.066	0.249	0	1
log(Number of doctor visits+1)	1.751	1.296	0	5.984
Any overnight hospital stay	0.121	0.326	0	1
Number of children	0.602	0.943	0	9
log(Net household income)	7.626	0.499	2.303	9.975

2.2 Analytic strategy

The aim of our empirical analysis is to assess whether there is a differential impact of last period unmet or beaten life satisfaction aspirations on last period life satisfaction

⁵To avoid issues of multicollinearity due to age-period-cohort underidentification, we group together the first two years, i.e. 1998 and 1999. We tried several grouping options and the coefficients of our variables of interest ($Unmet_{t-1}$ and $Beaten_{t-1}$) are unchanged.

aspirations for the future - contemporaneously with the realization of the met/unmet variable - and on one-period-ahead life satisfaction.

The main difficulty related with this empirical exercise concerns unobserved heterogeneity. First, comparability of self-reported life satisfaction across different individuals is hampered by issues of differential item functioning, as the interpretation of a life satisfaction scale may differ across individuals (see Angelini et al., 2014). Furthermore, latent traits of individuals that are constant over time may determine both their life satisfaction levels and their propensity to report high or low aspirations about future life satisfaction. Finally, individual level covariates that change over time in a similar fashion as the beaten/unmet aspiration patterns could confound the identification of the effect of positive/negative forecasting mismatches.

We solve issues of time-invariant unobserved heterogeneity using fixed effects panel data models, that allow us to purge our estimate from time-invariant individual traits. Assuming that reporting styles are constant within individuals and over time (see Angelini et al., 2011), inclusion of individual fixed effects also solves issues of differential item functioning. We also control for a rich battery of individual time-varying observable covariates, described above, hoping that these will mop up any remaining unwanted correlation between the error term and our time-varying treatment variables.⁶

Formally, we estimate the following model:

$$S_{i,t} = \alpha_i^1 + \beta_1^1 * Unmet_{i,t-1} + \beta_2^1 * Beaten_{i,t-1} + X'_{i,t-1}\gamma^1 + v_i + \xi_{i,t}^1$$

$$E[S_{t+4}^{t-1}] = \alpha_i^2 + \beta_1^2 * Unmet_{i,t-1} + \beta_2^2 * Beaten_{i,t-1} + X'_{i,t-1}\gamma^2 + \delta^2 * S_{i,t-1} + v_i + \xi_{i,t}^2$$

The first equation is related with life satisfaction levels at time t , while the second regards life satisfaction aspirations at time $t - 1$. In each equation, the α_i are individual fixed effects⁷, $Unmet_{t-1}$ and $Beaten_{t-1}$ are two dummy variables defined above for unmet and beaten aspirations (the reference group being meeting one's aspirations), the vector X_{t-1} includes the time varying covariates described above. In the equation for $E[S_{t+4}^{t-1}]$ we also control for S_{t-1} : since people with high level of life satisfaction also have high contemporaneous levels of aspirations (the unconditional correlation between the two variables is 0.7), we want to avoid generating bias due to the omission of this variable⁸. Finally, $v_i + \xi_{i,t}^j, j = 1, 2$ represents a composite error term: we estimate the

⁶On the other hand, time-invariant covariates like education, gender and country of birth are absorbed by the individual fixed effects.

⁷We have performed cluster-robust Hausman tests to verify the plausibility of fixed vs. random effects models, and the tests always reject the random effects specification.

⁸Thus, we compare observations with the same S_{t-1} but past aspirations levels above or below that level. When we include S_{t-1} in the equation for S_t , its coefficient is not significant and coefficients on the treatment variables are unchanged. However, we prefer to leave it out because of the well-know bias (see Nickell, 1981) of the within-groups estimator in panel data models including both individual fixed

two equations jointly to deal with cross-equation correlation in the error terms.⁹ Since the same respondent appears in our data multiple times, we cluster standard errors at the individual level.

3 Empirical results

Our main empirical results are presented in Table 2, where we report selected estimation outcomes from the model described in the previous section.

Table 2: Unmet and beaten aspirations effects

	(1) S_t	(2) $E[S_{t+4}^{t-1}]$	(3) S_t	(4) $E[S_{t+4}^{t-1}]$
Unmet	-0.048*** (0.013)	-0.017 (0.011)	-0.047*** (0.013)	-0.016 (0.011)
Beaten	0.003 (0.013)	0.115*** (0.012)	0.002 (0.013)	0.113*** (0.012)
S_{t-1}		0.621*** (0.006)		0.626*** (0.006)
Individual FE	Yes	Yes	Yes	Yes
Age quadratic	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Covariates	No	No	Yes	Yes
Observations	70,649	70,649	70,649	70,649
Individuals	13,145	13,145	13,145	13,145

Notes: Models in Columns (1) and (2) are estimated jointly, as models in Columns (3) and (4). Covariates included in Columns (3) and (4) are evaluation experience, employment status, civil status, the number of doctor visits, any overnight hospital stay, number of children, household income. Robust standard errors clustered at the individual level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The first two columns show results for S_t and $E[S_{t+4}^{t-1}]$ when we do not include the controls in vector X_{t-1} , while the last two columns show the same results when controls are included. It is easy to see that the estimated coefficients for $Unmet_{t-1}$ and $Beaten_{t-1}$ are statistically identical across the two blocks of columns. Looking at either Column 1 or Column 3, we find that next period life satisfaction decreases if people fail to meet their life satisfaction aspirations (without controls: $\beta_1^1 = -0.048, p < 0.01$; with controls: $\beta_1^1 = -0.047, p < 0.01$), while going beyond one's aspirations does not

effects and lagged dependent variables.

⁹Estimation equation-by-equation leaves our conclusions unchanged.

lead to increased life satisfaction (without controls: $\beta_2^1 = 0.003, p > 0.1$; with controls: $\beta_2^1 = 0.002, p > 0.1$): the effects are asymmetric. The first effect is quantitatively equivalent to a -0.027 SD change in S_t (see Table 1), while the second is close to zero in magnitude.¹⁰

Why do people suffer from failing to meet a target while they do not feel any better when going beyond their target? A potential explanation for this asymmetry can be found in results shown in either Column 2 or Column 4, where our dependent variable is the life satisfaction benchmark people set for the future, $E[S_{t+4}^{t-1}]$, after reporting S_{t-1} . We find that failing to meet their targets does not have an impact on future aspirations (without controls: $\beta_1^2 = -0.017, p > 0.1$; with controls: $\beta_1^2 = -0.016, p > 0.1$), while beating their life satisfaction aspirations leads individuals to set a higher target for future life satisfaction (without controls: $\beta_2^2 = 0.115, p < 0.01$; with controls: $\beta_2^2 = 0.113, p < 0.01$)¹¹. The first effect is close to zero in magnitude, while the second one is quantitatively equivalent to a $+0.059$ SD change in $E[S_{t+4}^{t-1}]$ (see Table 1). Individuals' expectations are pushed up by unexpected positive shifts in life satisfaction, but people do not rescale aspirations downwards when they fail to meet previous targets.

In the Appendix we also present a battery sensitivity tests to our main empirical results, that we briefly describe here. First, we obtain similar results also when, rather than considering categorical indicators for beaten or unmet aspirations, we include a linear spline in the value of the difference between life satisfaction realizations and aspirations, with a knot at a difference of zero, as shown in Table A.1. We tested for difference in slopes between the positive and the negative segments, and we can reject the null of equal trends with a p-value of 0.01 for both S_t and $E[S_{t+4}^{t-1}]$.

Second, as shown in Table A.2, the patterns we have shown are stable across the general population, as our findings are robust to dropping people aged 65+ from our sample, and we obtain similar results also when we split the sample between males and females, although for males the negative $Unmet_{t-1}$ effect on S_t is less significant. Finally, the last two columns of Table A.2 report results when we drop observations for which the value of expected life satisfaction is either 0 or 10, as individuals cannot fail to meet aspirations equal to 0 and cannot beat aspirations equal to 10. Our results are robust also within this subsample.

¹⁰We tested for equality of magnitude of the coefficients related with $Unmet_{t-1}$ and $Beaten_{t-1}$, and reject the null with a p-value of 0.04.

¹¹Even in this case, a test for the equality of the coefficients related with $Unmet_{t-1}$ and $Beaten_{t-1}$ is rejected with a p-value of 0.001. Furthermore, the coefficient on S_{t-1} is positive and strongly significant.

4 Discussion and Conclusion

Social scientists have theorized that subjective well-being is a relative concept, that also depends on the discrepancy between its realization and an aspired level. For instance, Higgins' self-discrepancy theory (Higgins, 1987) postulates that emotional discomfort arises if the actual self does not match the ideal self. Our study reports evidence in favor of this hypothesis. We find that (not) achieving aspirations per se exerts significant effects on life satisfaction, even after controlling for individual characteristics and potential biases in reporting styles. By so doing, we are among the first to characterize people's response to beaten or unmatched affective forecasts (Wilson and Gilbert, 2003). Two aspects of our study represent important advancements in the existing literature.

First, we investigate the asymmetric impact of beaten and unmet aspirations on life satisfaction. Boyce et al. (2013) study the association between income changes and subjective well-being. They show that income losses exert a larger effect on well-being than equivalent income gains, and conclude that loss aversion does not only represent an affective-forecasting error (Kermer et al., 2006) but also applies to experienced losses. Similarly, we find that while going beyond one's aspirations exerts weak effects on life satisfaction, becoming aware of a negative discrepancy between actual and aspired conditions significantly reduces subsequent realizations of life satisfaction.

Second, we explicitly account for the interplay between life satisfaction and the endogenous formation of aspirations. In this respect, the asymmetric response of aspirations to achievements and failures empirically observed in our data provides an "hedonic adaptation" explanation of the previous result. If life satisfaction depends on the comparison with a reference point and beaten aspirations shift the target upwards, it will be harder for people to say they are satisfied with their life even after an unexpected positive shift in their subjective well-being. Thus, the positive effects exerted by beaten aspirations on life satisfaction are likely to be temporary and limited in size. On the other hand, unmet aspirations do not have any negative impact on reference points: people fail to internalize hedonic losses. In this case, individuals entirely and persistently bear the negative emotional consequences of not achieving aspirations.

Our results suggest that the pursue of high aspirations - likely to be unmatched by future well-being levels - will hurt long-run life satisfaction. Low aspirations - likely beaten by future life satisfaction realizations - will not pay in terms of future subjective conditions either, as they would be adjusted upwards before leading to true gains in subjective well-being.

Author contributions

All authors contributed equally to the development of the study concept and the study design, to the analysis and interpretation of the data and to the drafting and revision of the manuscript. All authors approved the final version of the manuscript for submission.

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Appendix

Table A.1: Positive and negative difference

	(1)	(2)
	S_t	$E[S_{t+4}^{t-1}]$
Positive difference	-0.002 (0.006)	0.052*** (0.006)
Negative difference	0.024*** (0.006)	-0.005 (0.007)
S_{t-1}		0.630*** (0.007)
Individual FE	Yes	Yes
Age quadratic	Yes	Yes
Year FE	Yes	Yes
Covariates	Yes	Yes
Observations	70,649	70,649
Individuals	13,145	13,145

Notes: Models in Columns (1) and (2) are estimated jointly. Covariates included are evaluation experience, employment status, civil status, the number of doctor visits, any overnight hospital stay, number of children, household income. Robust standard errors clustered at the individual level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.2: Robustness tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Age ≤ 65		Females		Males		$0 < E[S_{t-1}^{t-6}] < 10$	
	S_t	$E[S_{t+4}^{t-1}]$	S_t	$E[S_{t+4}^{t-1}]$	S_t	$E[S_{t+4}^{t-1}]$	S_t	$E[S_{t+4}^{t-1}]$
Unmet	-0.034** (0.014)	-0.009 (0.012)	-0.057*** (0.018)	-0.025 (0.016)	-0.034* (0.018)	-0.008 (0.016)	-0.047*** (0.013)	-0.009 (0.012)
Beaten	0.007 (0.015)	0.122*** (0.013)	0.015 (0.018)	0.112*** (0.016)	-0.013 (0.019)	0.114*** (0.016)	-0.004 (0.013)	0.115*** (0.012)
S_{t-1}		0.604*** (0.007)		0.609*** (0.009)		0.645*** (0.010)		0.627*** (0.007)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age quadratic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	58,579	58,579	36,901	36,901	33,748	33,748	66,312	66,312
Individuals	11,362	11,362	6,821	6,821	6,324	6,324	12,624	12,624

Notes: Models in Columns (1) and (2) are estimated jointly, as models in Columns (3) and (4), Columns (5) and (6), and Column (7) and (8). Covariates included are evaluation experience, employment status, civil status, the number of doctor visits, any overnight hospital stay, number of children, household income. Robust standard errors clustered at the individual level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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