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Poverty and Psychological Resilience

Sara Ayllón

University of Girona,
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Poverty and Psychological Resilience*

Abstract

I study the extent to which poverty and psychological well-being can be thought of as inputs in a feedback loop, by which poverty may have an influence on life satisfaction, while past low levels of satisfaction with life may lead to economic hardship. I use joint dynamic random-effects models that account for state dependence, feedback effects, unobserved heterogeneity and initial conditions, using data from the German Socio-Economic Panel for 1992–2018. Poverty hurts while it lasts: it raises the probability of being dissatisfied with life in the year it occurs and the following year, and people do not adapt to it. But the damage neither accumulates with the years spent in poverty nor outlasts the spell: people recover their previous life satisfaction within two years of leaving poverty, also after repeated spells. I interpret this as psychological resilience to poverty. Satisfaction with income and housing recovers more slowly than overall life satisfaction. In the other direction, low levels of satisfaction with life have a (short-lived) positive influence on the probability of being in poverty. Evidence suggests that psychological uneasiness can be added as an explanation to persistent poverty.

JEL classification

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Keywords

life satisfaction, poverty, state dependence, feedback effects, adaptation, resilience, Germany, SOEP

Corresponding author

Sara Ayllón

sara.ayllon@udg.edu

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Data availability statement. This paper uses data from the German Socio-Economic Panel (SOEP), SOEP-Core v36 (EU edition), including the IAB-SOEP Migration Samples and the IAB-BAMF-SOEP Survey of Refugees (Socio-Economic Panel, 2021; IAB-SOEP Migration Samples, 2021; IAB-BAMF-SOEP Survey of Refugees, 2021; Goebel et al., 2019), made available by the German Institute for Economic Research (DIW Berlin). The data cannot be shared by the author, but they are available to researchers from the Research Data Center of the SOEP (FDZ-SOEP) at DIW Berlin under a data distribution contract.

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1 Introduction

Poverty alleviation lies at the heart of any welfare state in the world. In turn, life satisfaction is being discussed more and more as a possible policy goal (Stiglitz et al., 2009; OECD, 2013; Fleurbaey and Blanchet, 2013; O'Donnell et al., 2014; Frijters et al., 2020). The OECD has issued guidelines for measuring subjective well-being and reports it alongside income in its regular assessments of well-being (OECD, 2013, 2024), the UK Treasury asks for public policies to be appraised by their effects on well-being (HM Treasury, 2021), and the World Happiness Report ranks countries by the life satisfaction of their populations (Helliwell et al., 2025; Layard and De Neve, 2023). But in order to design the right policies to combat poverty and, at the same time, enhance emotional well-being, we need to have a complete and comprehensive understanding of what determines these two processes – and to what extent they determine each other. Whether poverty and psychological well-being combine to produce a feedback loop is a question that remains unanswered.

On the one hand, while the mechanisms are the focus of attention of current research, it has been found that stress, depression, negative affect or dissatisfaction (partly brought on by poverty) can have an influence on economic behaviours that often impede individuals from taking the kind of decisions that would help them out of poverty (Banerjee and Duflo, 2011; Mani et al., 2013; Mullainathan and Shafir, 2013; Haushofer and Fehr, 2014; Ridley et al., 2020). From the growing literature on behavioural economics applied to the understanding of poverty, we know that poor individuals suffer not only from material want, but also from a lack of mental resources (attention, understanding, cognitive capacity).² This explains behaviours that would be qualified as “irrational” by standard economic theory (Jäntti et al., 2014a). In developing economies, lack of aspirations and hopelessness have also been found to explain behavioural poverty traps (Duflo, 2012; Dalton et al., 2016). Moreover, not only behaviour but personality traits may also play a role at explaining poverty – for example, optimistic and agreeable individuals are known to be more likely to find a job or a partner with whom to share income (Almlund et al., 2011).

On the other hand, it is natural to think that the economic situation of a household (as many other life domains) influences individuals' life satisfaction. The effect of income on satisfaction with life has been studied before (Di Tella et al., 2010; Ferrer-i-Carbonell and Van Praag, 2008),

² Scarcity is said to make individuals less insightful, less forward-thinking and less controlled while more risk-averse and more likely to discount future payoffs so poor individuals are less willing to invest in long-term outcomes as education or health (Mullainathan and Shafir, 2013; Haushofer and Fehr, 2014).

but not much attention has been paid to the group of those at the bottom of the income distribution, who qualify as poor (with the exceptions of Clark et al., 2016; Luo, 2022, and Nivorozhkin and Promberger, 2025, discussed below). While it seems obvious that poverty should be associated with dissatisfaction, behavioural economics and the tenets of ‘Prospect Theory’ teach us that individuals’ judgements depend on previous experiences, and that the past can offset the present because individuals change their expectations (Kahneman and Tversky, 1979). As is explained in Jäntti et al. (2014b), one of the main ingredients of Prospect Theory is *reference dependence*, by which welfare depends more on deviations from a reference level than on actual levels. In turn, subjective well-being has been found to be based more on relative than on absolute income (Easterlin, 1974; Di Tella and MacCulloch, 2006; Clark et al., 2008b). But, again, ‘income losses loom larger than corresponding gains’ (Tversky and Kahneman, 1992). So, all in all, it is difficult to predict the influence of poverty (partly brought on by dissatisfaction) on psychological well-being.

Embedded in any analysis of the interrelationship between poverty and subjective well-being is the question of adaptation and resilience. Happiness scholars have long studied the consequences of certain life events in determining whether human beings are capable of adapting to their new situation and of recovering their levels of well-being or satisfaction. Divorce, disability, unemployment, redundancy and factory closure are some of the events analysed (Oswald and Powdthavee, 2008; Lucas et al., 2003; Winkelmann and Winkelmann, 1998; Clark and Oswald, 1994; Clark et al., 2001; Ferrer-i-Carbonell, 2013). The literature has concluded that people can adapt to most events – except unemployment (Clark et al., 2008a; see also Clark et al., 2016).^{3, 4}

The literature on adaptation to income changes is less conclusive. According to Ferrer-i-Carbonell and Van Praag (2008), individuals also adapt to change: higher income does not bring

³ It could be argued that the effect of poverty on life satisfaction is less clear for analysis compared to other (more easily observable) statuses as being unemployed or disabled. However, the fact that individuals may not know the poverty threshold exactly does not mean that they are not aware or perceive well what is their economic situation. Also, one could believe that, with their actions, individuals “choose” to be poor (for example, by retiring early) but I find unlikely that a household deliberately “chooses” to have an insufficient level of economic resources.

⁴ The literature on unemployment points to lasting damage. Life satisfaction remains lower after re-employment (Clark et al., 2001), and Clark and Lepinteur (2026) conclude in their review that the well-being losses of unemployment continue for many years after the spell has ended. Knabe and Rätzl (2011), however, show that this scar works through the fear of becoming unemployed again: once expectations are taken into account, past unemployment has only a negligible effect. Similarly, Hetschko et al. (2014) find that the life satisfaction of the unemployed rises substantially when they retire and the norm to be employed no longer applies to them, and Watson and Osberg (2017) find that men recover from isolated episodes of economic insecurity but not from repeated ones. Whether poverty, which is more frequent and more fluid than unemployment, leaves a similar scar is one of the questions this paper addresses.

much additional satisfaction, because individuals adapt their views on what is satisfactory to their changing circumstances. The authors study the adaptation phenomenon and find that the results depend on the model specification used. They also examine possible asymmetries that depend on the direction of the change (income increasing vs. income declining) and conclude that if there is any degree of income adaptation, it is to a decline in income. Similarly, Di Tella et al. (2010) reject the hypothesis that there is no adaptation to income (among females) and conclude that no significant income effects remain four years after a change in income. Clark (1999) shows that job satisfaction responds to changes in pay rather than to its level, which is consistent with adaptation. More recent evidence, however, leans against adaptation. Using a richer lag structure in the SOEP and British panels, Kaiser (2020) finds no adaptation to either own or reference income, and in Australian data past episodes of major financial worsening are still associated with lower life satisfaction years later (Clark et al., 2021).

In this paper, I revisit the interrelationship between life satisfaction and income with a particular focus on individuals with incomes below the poverty line. Only a few papers focus on this issue, and they point to the absence of adaptation. The closest to the present study is Clark et al. (2016).⁵ Those authors analyse the influence of past poverty on the current level of subjective well-being, while accounting not only for the incidence of poverty, but also for its intensity. They show that life satisfaction in Germany declines with poverty, and that individuals do not adapt to their economic deprivation status, however long the spell of poverty. Having considered unemployment, disability, retirement, loss of a partner and changing family size, the authors can find no particular cause for the lack of adaptation. Importantly though, their analysis is restricted to the first poverty spell observed, and therefore ignores other dynamics. Yet poverty is known for being a very dynamic phenomenon, in which short and frequent spells are much more likely than long and unique ones (Mendola and Busetta, 2012; Gradín et al., 2012). Luo (2022) also finds no adaptation of life satisfaction to poverty in Germany (although he does in Switzerland), and Nivorozhkin and Promberger (2025) find that the life satisfaction of German recipients of means-tested benefits does not recover while they receive them.

In a companion paper using the same data, Clark et al. (2015) show that the negative consequences of poverty on life satisfaction persist even after the poverty spell has ended. And, they also show that the levels of subjective well-being are lower if poverty spells are

⁵ Caria and Falco (2018) study the relationship between life satisfaction (termed ‘happiness’ in their paper) and poverty (termed ‘vulnerability’) in urban Ghana among working adults. However, they include their measure of vulnerability, log real earnings and earnings quartiles in the same specification which makes results difficult to interpret.

concatenated, indicating a certain preference for income stability (even at so low levels). They also find that the more consecutive the years in poverty, the lower the levels of subjective well-being. The only sign of adaptation in Clark et al. (2016) is a partial recovery after five or more years in poverty among women who were 60 or older when they became poor, which the authors link to widowhood. A disadvantage of the fixed effects models used by Clark et al. (2016) is that they cannot assess the effect of important time-invariant characteristics such as gender, education or marital status (if they do not change during the studied period). Also, all the individuals in the sample need to participate at least for five consecutive waves which may arbitrarily select the sample.

More importantly, this literature has not taken into account the possibility that not only might poverty affect emotional well-being, but life satisfaction levels may have an influence on households' economic situation. In my view, poverty dynamics and psychological resilience (or lack thereof) can be thought of as endogenous processes considerably affected by reverse causality. Evidence that well-being shapes later economic outcomes is growing: life satisfaction in early adulthood predicts higher earnings later on (De Neve and Oswald, 2012), and a single life-satisfaction score predicts later decisions such as quitting a job or separating from a partner (Kaiser and Oswald, 2022). Randomised trials, however, find that neither psychotherapy programmes (Haushofer et al., 2020) nor the treatment of depression (Angelucci and Bennett, 2024) raises earnings *by themselves*, so whether, and for how long, low well-being feeds back into poverty remains an open question. In this sense, and as discussed by Haushofer and Fehr (2014) in their review, a key feature of the analysis of the relationship between poverty and psychology is the temporal dimension, which remains largely unexplored. In this paper, I want to rectify this lacuna by proposing new micro-econometric joint models for poverty and psychological well-being, while accounting for the higher-order dynamics between both processes. State dependence, feedback effects, the initial conditions problem and unobserved heterogeneity are also taken into account.

Crucially, in this paper psychological resilience to poverty means the absence of cumulative and lasting damage to life satisfaction, and it is distinct from adaptation. Both concepts concern how the effect of poverty evolves over time, but they ask different questions. Adaptation, the focus of Clark et al. (2016), asks whether the effect fades while poverty lasts: whether people get used to being poor, so that their life satisfaction moves back towards its previous level although they are still poor. Resilience, as I use the term, asks whether the damage stays contained. It has three components that can be tested separately: whether dissatisfaction with

life builds up the longer people remain poor (the opposite of adaptation), whether people recover fully once they leave poverty, and whether repeated spells wear them down. A person can therefore be resilient without adapting: poverty may hurt for as long as it lasts, without the damage growing over time or outlasting the spell. In the terms of Grafton et al. (2019), this is resilience through recovery and robustness rather than through resistance, since poverty may well hurt while it lasts. In economics, Etilé et al. (2021) similarly measure resilience to major life events, including financial shocks, by how fast life satisfaction recovers; in psychology, the word is sometimes reserved for the absence of any initial drop, and a drop followed by a return is called recovery (Bonanno, 2004). Asheim et al. (2020) propose a formal measure of resilience in economics. The absence of adaptation and the presence of resilience are therefore compatible: poverty can hurt as long as it lasts and still leave no trace once it is over. Because my models include several lags of both outcomes and their accumulation over time, they can assess all three components, for individuals who enter, leave or remain in poverty.

Furthermore, much of the research into the link between psychology and poverty, as developed by behavioural economists, is based on (and restricted to) laboratory studies or natural experiments (Banerjee and Duflo, 2011). By contrast, this paper intends to shed new light on the relationship between life satisfaction and poverty using data from a large longitudinal survey that is representative of a whole nation. Moreover, differently from the growing literature on the topic that mostly refers to low and middle-income countries, I use data from Germany, one of the richest countries in the world.

My results show that poverty hurts while it lasts, but it neither accumulates nor leaves a psychological scar. Being poor in the current and in the previous year raises the probability of being dissatisfied with life, but poverty two or more years back does not. Simulating whole poverty histories, permanent poverty raises the probability of being dissatisfied with life by about 1.7 percentage points, roughly a quarter of the baseline, year after year: there is no adaptation, as in Clark et al. (2016), but there is no build-up either. After a poverty spell ends, people return to their previous level of life satisfaction within two years, and they do so after repeated spells as well as after a first one. Satisfaction with household income and housing remains lower for several years after exit, while overall life satisfaction recovers, and recovery is broadly shared across personality traits, although poverty that starts with a job loss or a separation hurts more. I interpret this combination as psychological resilience to poverty. In the other direction, dissatisfaction with life raises the probability of being poor for about two years. These results are robust to alternative poverty lines and equivalence scales, other thresholds for

dissatisfaction, the full 0-10 scale of life satisfaction, higher-order dynamics, different samples, clustering by original household and the timing of income.

The paper is structured as follows. Section 2 presents the data and some descriptive statistics. Section 3 describes the econometric strategy, and Section 4 presents the main results together with a series of robustness checks. Section 5 explores the mechanisms behind these results. Section 6 summarises the findings and proposes avenues for future research.

2 Data and definitions

Data are from the German Socio-Economic Panel (SOEP; Goebel et al., 2019), which is probably one of the data sets most used in the analysis of subjective well-being in Europe and has the great advantage of having run for a long time now. I use SOEP-Core version 36, and the period of analysis covers the calendar years 1992 to 2018, so that it intentionally ends before the coronavirus pandemic. The pandemic was a large and unusual shock to both incomes and well-being, which this paper does not consider.⁶ The analysis starts in 1992 because household income for the East German sample is not available in earlier waves (Clark et al., 2016); as a robustness check, I also use the West German data from 1985 onwards.⁷ The initial sample consists of all adults (18 years of age or more) with valid information on household income and life satisfaction as well as on a number of control variables. In total, the sample contains 485,569 observations on 66,210 individuals, who are observed for 7.3 years on average. As in Clark et al. (2016), I keep all the SOEP subsamples. Some of them oversample specific groups (high-income households, low-income families, single parents, refugees and top shareholders, among others). The poverty line is computed with sampling weights, so that it is not affected by this oversampling, and the robustness section checks whether the results change when these subsamples are excluded.

Following the recommendations for poverty measurement set by the European Commission (2010), an individual is defined as poor if their equivalised household income is below 60% of the median (Atkinson et al., 2002). In my case, the income distribution used refers to post-government income. Moreover, I use the modified OECD equivalence scale that gives a weight

⁶ In the SOEP, household income is collected retrospectively: the income reported in a given wave refers to the previous calendar year. Poverty in calendar year 2019 could therefore only be measured with the income reported in the 2020 wave. That wave was collected during the pandemic, with fieldwork disruptions and changes in who was interviewed, so using it would bring in the very effects of the pandemic that this paper leaves aside, even though its income refers to 2019.

⁷ Following Clark et al. (2016), I do not use the first wave of data relative to 1984 as questions on capital and pensions were asked differently.

of 1 to the first adult, of 0.5 to the rest of members over the age of 13 and 0.3 to children under the age of 14. I follow a relative approach to poverty measurement which implies that each year the poverty threshold varies. The poverty line is computed every year over all individuals living in private households, children included, using cross-sectional weights. On average, 11.9% of the adults in the sample are poor. As a robustness check, I also use the square-root equivalence scale of Clark et al. (2016).

Life satisfaction is measured in the SOEP data on an 11-point scale (from 0 for individuals with a low level of general satisfaction with life and 10 for those with a high level). The question reads: "How satisfied are you with your life, all things considered?", with answers from 0 (completely dissatisfied) to 10 (completely satisfied).⁸ The question is asked to all individuals above the age of 16 but I restrict the analysis to individuals that are 18 or older given that the number of missing values for young people at the age of 17 is abnormally large. Thus, the analysis refers to the adult population in Germany. Note that SOEP data gives the possibility to work with individual answers to the life satisfaction question which offers a great advantage compared to variables that measure well-being at the household level via the answer of a household head or representative (which is then imputed to the rest of household members). This is the case, for example, for well-being measured by perceived financial difficulties (see Ayllón and Fusco, 2017). Having the variable at the individual level allows enough variability within the household and the possibility that poverty affects well-being differently to each household member.

To analyse the interrelationship between poverty and life satisfaction by means of random-effects probit models, the dichotomization of the well-being variable is required. In this case, and given that the median and the mean are 7, I consider individuals with a value of 4 or below as dissatisfied with life (low satisfaction with life) and those with 5 or more as satisfied. This means that 8.4% of the sample are considered dissatisfied. The use of this threshold has the advantage of capturing those truly unsatisfied and allows working with a group of similar size to those considered poor. Section 4.3 checks whether the findings depend on this particular choice, and also estimates the model with life satisfaction on its full 0-10 scale.

⁸ Kahneman and Deaton (2010) argue about the importance of distinguishing two aspects of subjective well-being: life satisfaction and emotional well-being. Life satisfaction refers to the thoughts that we have about our own life when we think of it whereas emotional well-being is related to the emotional quality of everyday experiences (including joy, stress, sadness, anger and positive or negative affect). In this paper, I measure life satisfaction which is much more strongly related to socioeconomic status than emotional well-being which is rather sensitive to circumstances that evoke positive or negative emotions.

The explanatory variables in the analysis are gender, age (eight age groups), residence in East or West Germany, education (less than high school, high school and more than high school), marital status (married, single, widowed, divorced and separated), labour-force status (employed, registered unemployed, not working and aged 65 or more, and other not working), the number of children under 18 in the household, and year dummies. They are the same as in Clark et al. (2016), to ease the comparison of results. Table 1 shows summary statistics by poverty status. The poor are 0.8 points less satisfied with their lives than the non-poor and twice as often dissatisfied with life (16.0% versus 7.3%), and they are more often women, divorced, less educated, unemployed and living in East Germany.

Table 1. Summary statistics by poverty status, adults, Germany, 1992–2018

	Not poor	Poor	All
Life satisfaction (0-10)	7.10 (1.74)	6.31 (2.08)	7.01 (1.80)
Dissatisfied with life (%)	7.3	16.0	8.4
Equivalised household income (1,000 EUR, nominal)	21.81 (15.38)	8.02 (2.28)	20.17 (15.13)
Age	49.94 (17.28)	50.99 (19.65)	50.07 (17.58)
Women (%)	50.4	58.2	51.4
Married (%)	60.0	38.0	57.3
Single (%)	21.9	29.0	22.7
Widowed (%)	8.7	12.0	9.1
Divorced (%)	7.4	16.8	8.5
Separated (%)	2.1	4.2	2.3
Less than high school (%)	14.3	33.9	16.6
High school (%)	63.0	58.4	62.4
More than high school (%)	22.8	7.7	21.0
Employed (%)	60.9	28.0	57.0
Registered unemployed (%)	3.4	18.1	5.1
Not working, aged 65+ (%)	19.8	26.4	20.6
Other not working (%)	15.9	27.5	17.3
East Germany (%)	20.7	27.6	21.5
Children under 18 in household	0.44 (0.82)	0.48 (0.96)	0.44 (0.84)
Person-years	420,087	58,325	478,412

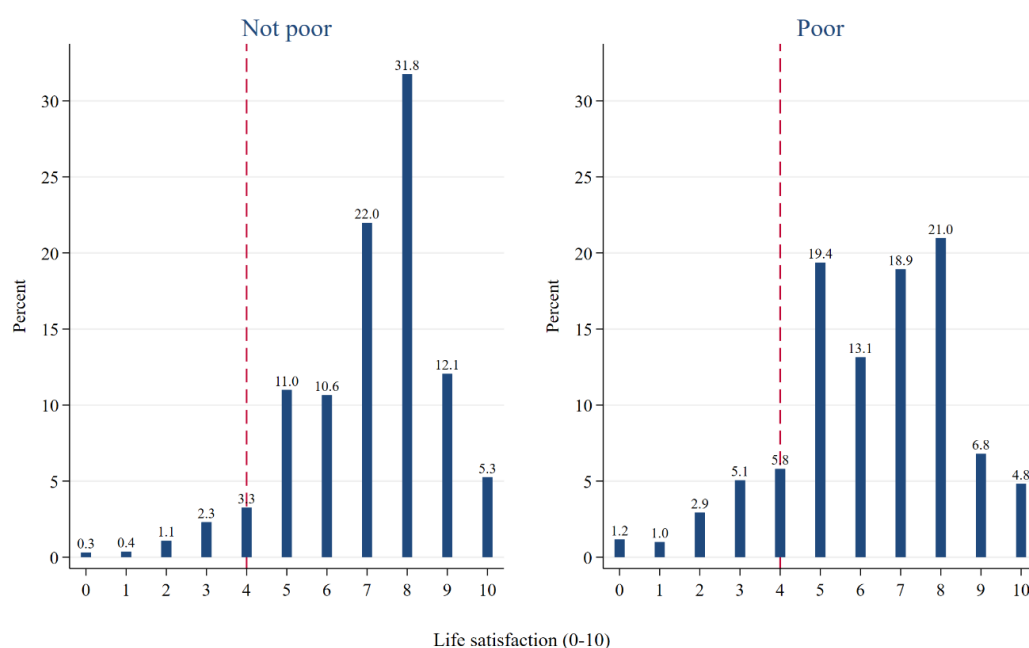
Source: own calculations on SOEP v36, main sample 1992–2018. Weighted with cross-sectional person weights. Poverty: equivalised household income (modified OECD scale) below 60% of the yearly median. Dissatisfied with life: life satisfaction of 4 or less. Continuous variables: mean (standard deviation); other rows: percentages. Person-years with a positive weight; 63,983 persons.

The timing of the income information deserves attention. In the SOEP, household income is collected retrospectively: the income reported in a given wave refers to the previous calendar year. I therefore date poverty to the calendar year to which the income refers, which means using the income reported in the following wave. Clark et al. (2016) instead combine life satisfaction with the income reported in the same interview, that is, with the income of the previous year. Since interviews take place mostly in the first half of the year, their measure captures the year just lived through, while mine captures the year in which life satisfaction is

reported. I use their timing as a robustness check. Two consequences of my choice are that 2018 is the last year for which poverty can be measured with SOEP v36, and that the last observation of each individual cannot be used.

Before turning to the econometric analysis, I present descriptive evidence on the link between poverty and dissatisfaction with life. Figure 1 shows life satisfaction levels by individual poverty status indicating that high levels of life satisfaction are more frequent among individuals that are not poor than among those that are poor. However, it also shows that a considerable percentage of poor individuals (perhaps surprisingly) have high levels of life satisfaction: about 51.5% of the poor report a life satisfaction of 7 or more (71.0% of the non-poor). At the same time, 16.0% of the poor are dissatisfied, more than twice the share among the non-poor (7.3%).

Figure 1. Distribution of life satisfaction by poverty status, adults, Germany, 1992–2018

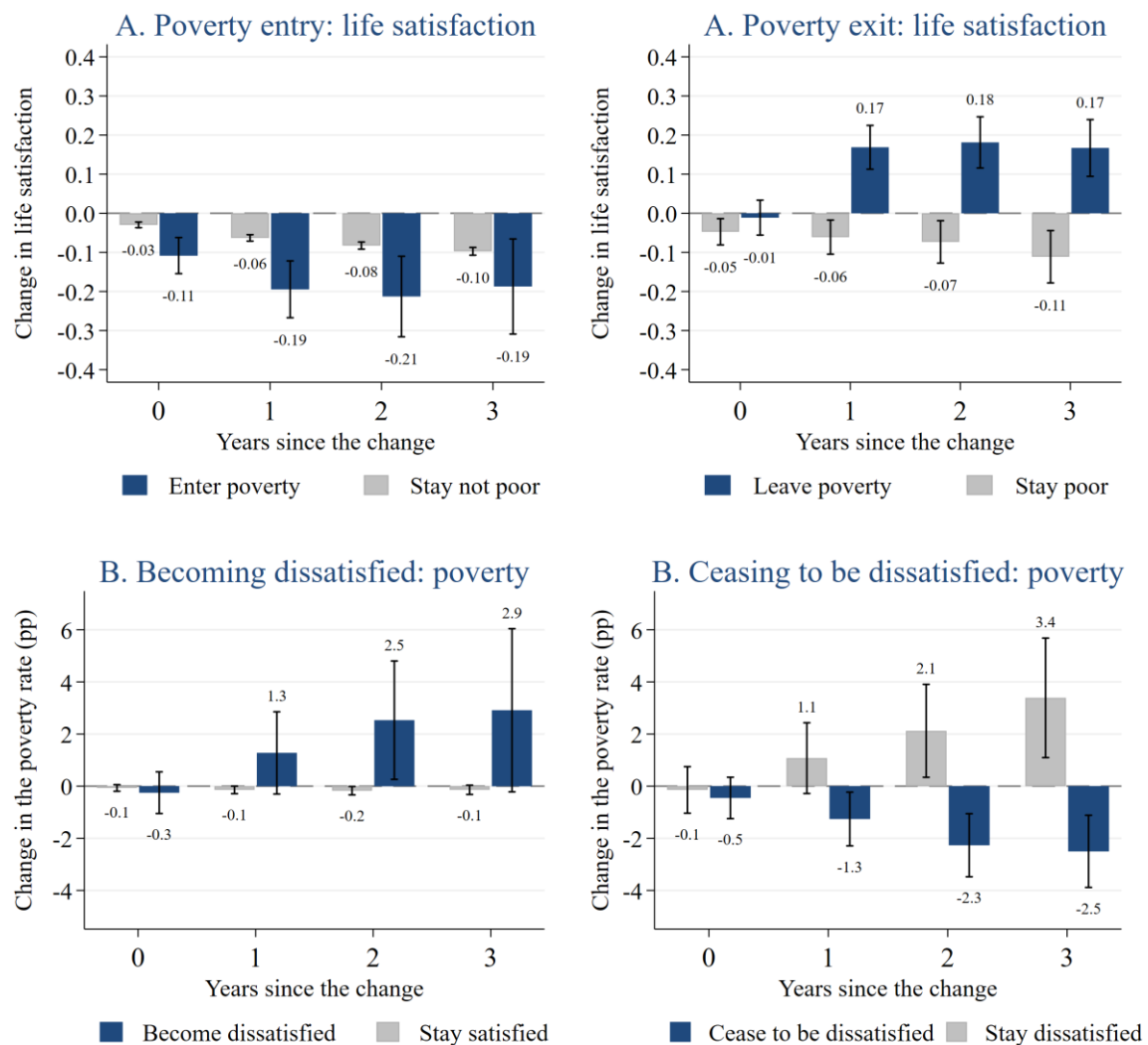


Source: own calculations on SOEP v36. Weighted with cross-sectional person weights. Poverty: equivalised household income (modified OECD scale) below 60% of the yearly median. The dashed line marks the threshold for dissatisfaction (life satisfaction of 4 or less).

Figure 2 follows the same individuals over time and looks at both directions of the relationship. Panel A shows the change in life satisfaction between the year before a change in poverty status and each of the following years, among those who remain in their new status. Those who enter poverty lose 0.11 points in the year of entry and about 0.2 points from the following year

onwards, about 0.13 points more than those who remain out of poverty; the loss neither fades nor grows while they remain poor. Those who leave poverty see no change in the year of exit, but from the following year their life satisfaction is about 0.17 points higher than before, 0.23 to 0.28 points more than among those who remain poor. Poverty thus lowers life satisfaction while it lasts, without signs of adaptation or accumulation, and life satisfaction recovers soon after poverty ends.

Figure 2. Poverty and life satisfaction in the years after a change in either, Germany, 1992–2018



Source: own calculations on SOEP v36, 1992–2018. Weighted means with 95% confidence intervals; 0 = year of the change. Panel A: change in life satisfaction between the year before entering (or leaving) poverty and the year shown. Panel B: change in the poverty rate (percentage points) between the year before becoming (or ceasing to be) dissatisfied with life (life satisfaction of 4 or less) and the year shown. Entry and exit refer to the status in consecutive years. At each horizon, only individuals who have remained in their new status since the change are included. Comparison groups: individuals whose status did not change over the same window, that is, never poor (poverty entry), always poor (poverty exit), always satisfied (becoming dissatisfied) and always dissatisfied (ceasing to be dissatisfied).

Panel B looks at the reverse direction: the change in the poverty rate after individuals become dissatisfied with life or cease to be so. The poverty rate does not change in the year in which dissatisfaction changes, but it rises over the following years among those who become and remain dissatisfied, by about 2.5 percentage points after two years, while it hardly changes among those who remain satisfied. Among those who cease to be dissatisfied, the poverty rate falls by up to 2.5 points, whereas it rises by up to 3.4 points among those who remain dissatisfied. Dissatisfaction with life is thus followed by a higher risk of poverty, with a delay of a year or more.

Taken together, the two panels show that poverty and dissatisfaction feed each other, which is why the two processes are modelled jointly in Section 3. They also show that the two links work on different time scales: poverty affects life satisfaction at once, whereas dissatisfaction affects poverty only with a delay, as one would expect if it works through earnings capacity. The econometric models that I propose in the next section take into account these features.

3 Econometric strategy

The analysis of the dynamics and the interrelationship between poverty and life satisfaction needs to be approached econometrically with a joint model.⁹ When doing so, there are multiple issues that one needs to consider but two are of special relevance (Skron dal and Rabe-Hesketh, 2014). First, it is important to take into account that both life satisfaction and poverty are likely to be affected by a considerable degree of genuine state dependence. That is, past levels of life satisfaction are likely to affect (by themselves) current levels of well-being – that is, inertia (Bottan and Perez Truglia, 2011; Piper, 2015; Fusco, 2016; Ayllón and Fusco, 2017). The same is true for poverty. Normally, such effect is accounted for by including in the right-hand side of an equation the lagged value of the outcome we are analysing. However, we do not have information on all past experiences because the observation window in any typical survey contains only a certain number of observations. As a result, we are confronted with an initial conditions problem. Moreover, unobserved factors are unlikely to be independent of the initial response. Ignoring such dependence would yield inconsistent estimates.¹⁰

⁹ Few studies of life satisfaction allow for more than one lag of the outcome (Bottan and Perez Truglia, 2011; Piper, 2015), and fewer still model it jointly with another outcome, as Skron dal and Rabe-Hesketh (2014) advocate; for perceived financial difficulties and income poverty, see Ayllón and Fusco (2017).

¹⁰ See Hsiao (1986), Wooldridge (2005), Chay and Hyslop (2014) and Skron dal and Rabe-Hesketh (2014) for a review of the different strategies that have dealt with the initial conditions problem.

Second, it is important to consider that different individuals could vary in their responses because of unobserved covariates. For example, in the case of life satisfaction, unobservables could refer to certain personality traits not collected in standard surveys.¹¹ This means that covariates are unlikely to be independent of the random intercept (the so-called endogenous covariates problem). Ignoring unobserved heterogeneity would overestimate the importance of state dependence (see, for instance, Biewen, 2009; Weber, 2002).

In order to consider both issues, the results are the outcome of two random-effects probits modelled jointly that include feedback effects and control for state dependence, initial conditions and unobserved heterogeneity.¹² The use of a bivariate probit has the advantage of allowing to integrate out the standard deviation of the individual specific-effects that links both equations through a free correlation.

Let $d_{it}=1$ if an individual i is dissatisfied with life at t and $d_{it}=0$ otherwise. Let $p_{it}=1$ if i is poor at t and $=0$ otherwise. The model can be specified as,

$$d_{it} = I(x_{it}'\beta_1 + \iota_1 p_{it} + \gamma_1 d_{it-1} + \delta_1 p_{it-1} + \alpha_{1i} + u_{1it} > 0) \quad (1)$$

$$p_{it} = I(x_{it}'\beta_2 + \delta_2 d_{it-1} + \gamma_2 p_{it-1} + \alpha_{2i} + u_{2it} > 0) \quad (2)$$

where $i=1,2,...,N$ refers to adult individuals and $t=2,...,T$ are the number of periods under study. x_{it} are the observed explanatory variables; d_{it-1} indicates whether the individual was dissatisfied with life in the previous year and γ_1 is the parameter for state dependence in well-being to be estimated. Similarly, p_{it-1} is an indicator for the past poverty status so that δ_1 captures the feedback effect from last year poverty experience on current life satisfaction levels. Following the same structure, in the poverty equation, γ_2 informs about the degree of state dependence in poverty and δ_2 about the influence of last year's level of satisfaction with life on current poverty. I expect all the mentioned coefficients to be positive.

Moreover, it is reasonable to think that, in the present context, current poverty can have an immediate impact on the current level of satisfaction. It is natural to think that individuals

¹¹ Modelling individual heterogeneity also deals with differences in how people use the life satisfaction scale: as Di Tella and MacCulloch (2006) argue, the problem of comparing life satisfaction scores is much reduced when the analysis moves from two individuals to large groups, because systematic differences in reporting between large groups are likely to be small.

¹² In life satisfaction studies, fixed-effects models to control for unobserved heterogeneity are more common than random effects. Fixed-effects models are often used to avoid concerns that more satisfied individuals are less likely to be poor or remain poor. In the present study, I explicitly model such selection. Moreover, the model I propose avoids problems of selection out of poverty and of left-censoring. Furthermore, it is arguable that fixed-effects models are less likely to control well for time-invariant characteristics in long panels as SOEP because when one increases the time horizon “everything becomes time-varying” even the criteria used to answer the life satisfaction question (Bottan and Perez Truglia, 2011).

observe whether they are suffering economic hardship (or not) which can have a strong influence on satisfaction levels at the very same moment. In order to account for this possibility, the specification includes p_{it} in the life satisfaction equation – being ι_1 the parameter that will capture the influence of poverty at time t on life satisfaction at the same period. Importantly, I do not believe that feeling dissatisfied at t can have an immediate impact on the poverty status at t . Rather, the psychological process behind dissatisfaction is likely to require some time before it affects household income.

The idiosyncratic error terms (u_1, u_2) are assumed to be independent over time and across the two equations, with zero mean and unit variance, while the random effects (α_1, α_2) are assumed jointly normally distributed with variances σ^2_1 and σ^2_2 and correlation ρ_α . I expect ρ_α to be positive indicating that unobservables that make someone more likely to be dissatisfied make them more likely to be poor, for example, pessimism.

Once the first order dynamic model is estimated, I introduce the lagged values of the outcome variables up to a third-order with the objective to study the temporal dimension. In terms of the definitions given in the introduction, the results point to psychological resilience if poverty in previous years does not raise current dissatisfaction once poverty has ended (recovery), if dissatisfaction does not build up with the number of years spent in poverty (no accumulation), and if recovery is not weaker after repeated spells (robustness). Adaptation, in contrast, would show up as an effect of current poverty on life satisfaction that declines while poverty lasts. This strategy is useful also to understand how far in the past the feelings of dissatisfaction may have an influence on an individual's income-generating capacity. In order to exploit even further the dynamics involved with the poverty experiences, similar regressions are estimated but instead of using lagged values, I account for the number of years spent in poverty and, symmetrically, the number of years dissatisfied with life in the previous three years.

Finally, I follow Wooldridge (2005) in the treatment of initial conditions. With k lags, the person effects are modelled conditional on the first k initial values of both outcomes (Wooldridge, 2005; Stewart, 2007). I find the density of the dependent variables from $t=2, \dots, T$ conditional on the initial condition and the explanatory variables – instead of $t=1, 2, \dots, T$. This implies the need to specify the density of the unobserved specific effects conditional on the dependent variables at $t=1$. I define:

$$\alpha_{1i} = \nu_1 + \lambda_1 d_{i1} + \zeta_1 p_{i1} + \eta_1' \bar{x}_i + \kappa_{1i} \quad (3)$$

$$\alpha_{2i} = \nu_2 + \lambda_2 p_{i1} + \zeta_2 d_{i1} + \eta_2' \bar{x}_i + \kappa_{2i} \quad (4)$$

by which, unobserved heterogeneity is estimated conditional to the initial conditions and the average of the time-varying explanatory variables. Equations (3) and (4) are written for the first-order model; with k lags, d_{i1} and p_{i1} are replaced by the k initial values of each outcome. As in Stewart (2007), I include the average of all the model time-varying covariates except for feedback effects and year dummies. In order to get consistent estimates, κ_{1i} and κ_{2i} are integrated out using adaptive Gauss-Hermite quadrature with 12 points, using the *cmp* command in Stata (Roodman, 2011), while assuming it follows a normal distribution with zero mean and $\sigma^2_{\kappa i}$ variance. Standard errors are clustered at the individual level.

Figure A1 in the Appendix represents the data-generating mechanism from $t=0$ to $t=3$ with the main effects of interest. The circles represent unobserved or latent variables and the rectangles represent observed variables. The thicker arrows represent probit regressions, the thinner arrows represent variability and the double-headed ones represent correlations.¹³ The process started prior to $t=0$ which explains why there is an arrow from pre-sample to the first observation.

Section 4.3 shows that the main results do not hinge on these modelling choices, nor on how dissatisfaction and poverty are defined: they hold when life satisfaction enters as a continuous outcome or with other thresholds for dissatisfaction, with other poverty lines, equivalence scales and timings of income, with more lags, fewer covariates and different samples, with standard errors clustered at the household level, and when the yearly error terms of the two equations are allowed to be correlated.

4 Empirical results

4.1 Main results

Table 2 shows the main results for the joint dynamic random-effects probits for being dissatisfied with life and for being poor, with one, two and three lags of both outcomes, without current poverty in the dissatisfaction equation (columns 1 to 3) and with it (columns 4 to 6). Column 6, with three lags and current poverty, is my preferred specification.

¹³ For simplicity, note that the subscript i that refers to individuals is omitted. In the figure, I have not distinguished between time-constant and time-varying covariates. In the case of time-constant covariates, an arrow would point to each response and also a double-headed arrow to each time-varying covariate. For clarity, I do not show either the correlations existing between explanatory variables at all time points and neither the dependence between presample responses (and explanatory variables) and the individual-specific effects.

Table 2. Poverty and dissatisfaction with life: joint dynamic random-effects probits with one, two and three lags, Germany, 1992–2018

	Without current poverty			With current poverty		
	1 lag	2 lags	3 lags	1 lag	2 lags	3 lags
	(1)	(2)	(3)	(4)	(5)	(6)
Dissatisfaction equation (d)						
d(t–1)	0.582*** (0.012)	0.579*** (0.012)	0.588*** (0.013)	0.581*** (0.012)	0.577*** (0.012)	0.586*** (0.013)
d(t–2)		0.361*** (0.013)	0.355*** (0.013)		0.360*** (0.013)	0.354*** (0.013)
d(t–3)			0.209*** (0.013)			0.209*** (0.013)
p(t)				0.094*** (0.015)	0.092*** (0.016)	0.091*** (0.017)
p(t–1)	0.122*** (0.015)	0.116*** (0.016)	0.122*** (0.017)	0.104*** (0.015)	0.101*** (0.016)	0.107*** (0.017)
p(t–2)		–0.041*** (0.016)	–0.039** (0.017)		–0.046*** (0.016)	–0.043** (0.017)
p(t–3)			–0.025 (0.017)			–0.026 (0.017)
Poverty equation (p)						
p(t–1)	0.966*** (0.013)	0.928*** (0.013)	0.936*** (0.014)	0.966*** (0.013)	0.927*** (0.013)	0.935*** (0.014)
p(t–2)		0.466*** (0.013)	0.422*** (0.014)		0.465*** (0.013)	0.421*** (0.014)
p(t–3)			0.260*** (0.014)			0.259*** (0.014)
d(t–1)	0.089*** (0.016)	0.053*** (0.016)	0.050*** (0.017)	0.100*** (0.016)	0.064*** (0.016)	0.061*** (0.017)
d(t–2)		0.057*** (0.017)	0.036** (0.018)		0.067*** (0.017)	0.045** (0.018)
d(t–3)			0.009 (0.017)			0.017 (0.018)
σ1, person effect in d	0.762*** (0.008)	0.663*** (0.009)	0.604*** (0.010)	0.762*** (0.008)	0.663*** (0.009)	0.604*** (0.010)
σ2, person effect in p	0.803*** (0.010)	0.667*** (0.010)	0.616*** (0.011)	0.802*** (0.010)	0.667*** (0.010)	0.616*** (0.011)
ρ	0.166*** (0.013)	0.194*** (0.017)	0.199*** (0.020)	0.133*** (0.014)	0.155*** (0.018)	0.155*** (0.022)
Person-years	428,588	378,880	337,953	428,588	378,880	337,953
Individuals	55,234	46,629	41,594	55,234	46,629	41,594

Source: own calculations on SOEP v36, adults, 1992–2018. Joint dynamic random-effects probits for being dissatisfied with life (d, life satisfaction of 4 or less) and poor (p, equivalised household income below 60% of the median), estimated with *cmp* (adaptive Gauss–Hermite quadrature). All equations include the initial conditions: the values of d and p in the one, two and three years before each person's first observation in the estimation sample (t_0), one for each lag (Wooldridge, 2005); their coefficients are not shown. Moreover, all equations also include gender, age groups, marital status, education, labour-force status, East Germany, number of children, year dummies and the person means of the time-varying variables (Mundlak, 1978). Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Both outcomes are highly persistent, and the persistence goes beyond the previous year: the second and third lags of dissatisfaction and of poverty are large and significant whenever they are included (in column 6, 0.59, 0.35 and 0.21 for dissatisfaction and 0.94, 0.42 and 0.26 for poverty), so a first-order model would miss part of the dynamics. This is in line with the literature on poverty dynamics (Cappellari and Jenkins, 2004; Biewen, 2009; Devicienti and Poggi, 2011; Fusco and Islam, 2012; Ayllón, 2013). The initial conditions (not shown for brevity) are large and significant in both equations, which confirms the need to model them; with more lags, each initial value weighs less, because the information is spread over more pre-sample years. The person effects of the two equations are positively correlated (0.155 in column 6): unobserved characteristics that make people more likely to be dissatisfied with life, such as pessimism, also make them more likely to be poor. The correlation is somewhat smaller when current poverty is included (0.13 to 0.16, against 0.17 to 0.20), because current poverty then captures part of the association between the two outcomes.

Regarding feedback effects, poverty raises the probability of being dissatisfied with life in the year it happens (0.091 in column 6) and in the following year (0.107). Poverty two years back has a small negative coefficient (-0.043), and poverty three years back has none. These effects hardly depend on the number of lags: the coefficient of current poverty is 0.094, 0.092 and 0.091 with one, two and three lags, and that of last year's poverty lies between 0.101 and 0.107. Without current poverty in the equation (columns 1 to 3), the coefficient of last year's poverty is somewhat larger (0.116 to 0.122), because it partly picks up the effect of current poverty. Yet, the results are consistent across specifications.

The negative coefficient on poverty two years back (-0.043) should not be read on its own. Someone who was poor two years ago was probably also dissatisfied in the following year, and the model already counts that dissatisfaction through the lags of dissatisfaction. Given past dissatisfaction, the negative coefficient means that someone whose dissatisfaction came from poverty is less likely to remain dissatisfied than someone equally dissatisfied for other reasons: dissatisfaction that originates in poverty fades faster. The overall effect of a poverty history can therefore only be assessed by combining all the coefficients through simulation.

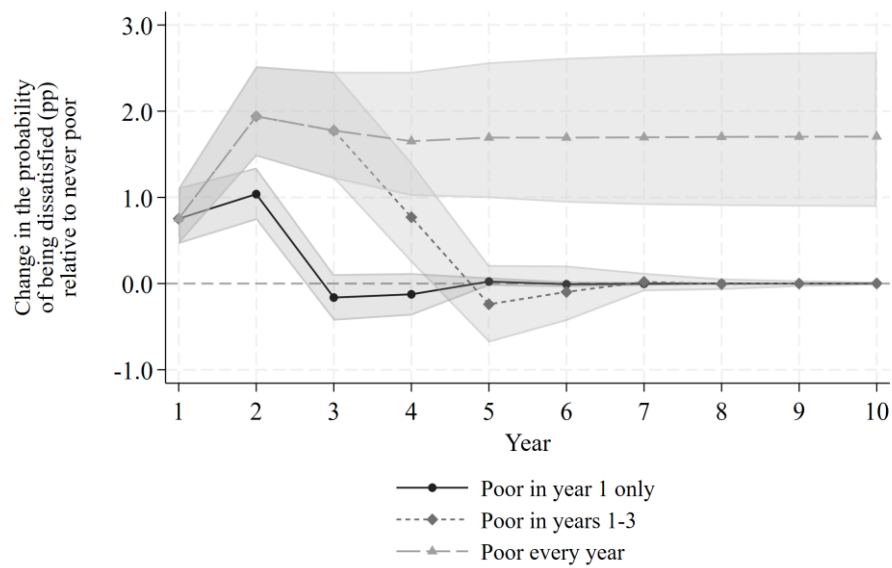
Figure 3 does so: it shows the total effect of three poverty histories on the probability of being dissatisfied with life, relative to never being poor. It is simulated from the model in column 6 of Table 2. Before year 1, everybody is not poor and not dissatisfied. In year 1, individuals enter poverty that may last only one year (poor in year 1 only), three years (poor in years 1-3) or all

years (poor every year). Dissatisfaction evolves through its own lags with the person effects being integrated out. In year 1 the three histories are identical, since everybody has just become poor, so the three lines start at the same point. This first point is the immediate effect of current poverty (p_t): becoming poor raises the probability of being dissatisfied by 0.75 percentage points in the same year. For those that escape poverty after one year (solid line with circles), the effect increases to 1.04 points in year 2: last year's poverty still raises the probability of being dissatisfied, and so does the dissatisfaction that poverty caused in the first year, because dissatisfaction is persistent. From the third year on, the effect is zero, because the negative coefficient on poverty two years back offsets the dissatisfaction that is still carried over. This is resilience through recovery: the initial blow is not resisted, but it leaves no scar once poverty ends.

In turn, for those in poverty for three years (short-dashed line with diamonds), the probability of being dissatisfied rises by up to 1.94 percentage points. However, once the poverty spell is over, the effect falls by more than half in the first year out of poverty (from 1.78 to 0.77 points) and disappears in the second (-0.24 , not significantly different from zero). Even after a three-year spell, people recover within two years. Recovery is thus as fast after a long spell as after a single year of poverty, and a longer spell does not leave a deeper or more lasting mark: it hurts more while it lasts, but its effect does not outlast it. This is psychological resilience in the sense defined in the introduction: the damage that poverty does to life satisfaction is real but contained, since it neither builds up with the years spent in poverty nor persists once poverty ends.

Permanent poverty (long-dashed line with triangles) raises the probability of being dissatisfied by about 1.7 percentage points, and the effect does not decline over time: after ten years it is still 1.7 points (95% interval of 0.9 to 2.7). This is a sizeable effect, since only 5 to 7 percent of the simulated population is dissatisfied with life: the risk of dissatisfaction rises by about a quarter. Poverty therefore hurts as long as it lasts, and people do not adapt to it, as Clark et al. (2016) also find. But the damage neither builds up over time nor outlasts the spell.

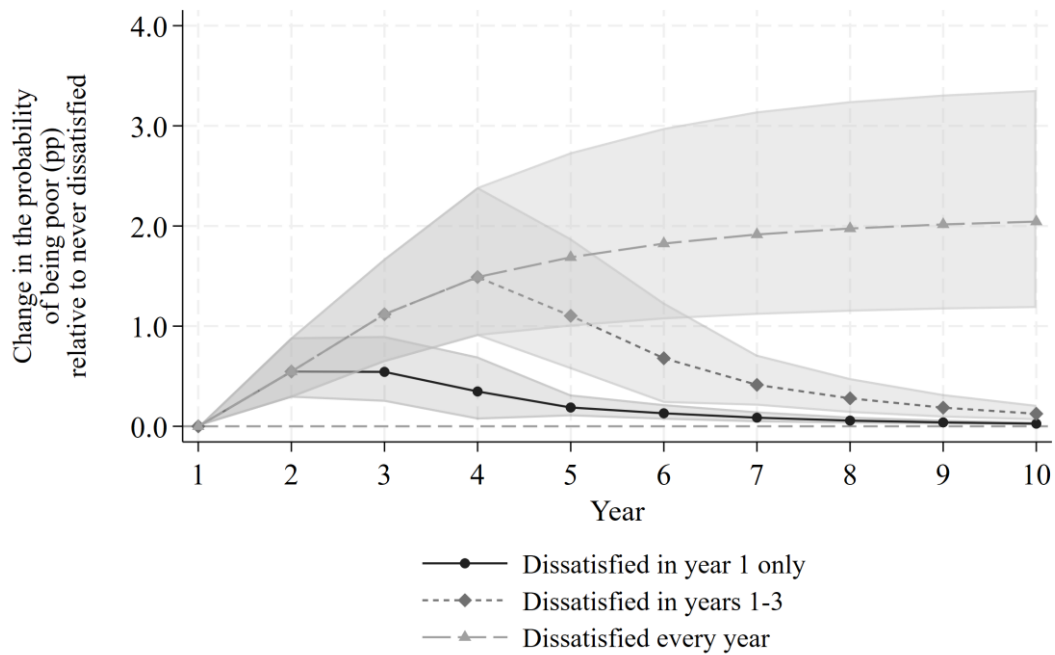
Figure 3. Total effect of poverty histories on the probability of being dissatisfied with life, Germany 1992–2018



Source: own calculations on SOEP v36. Simulated from the joint model in Table 2, column 6. Everybody starts not poor and not dissatisfied; the poverty history shown is imposed from year 1 onwards and dissatisfaction evolves through its own lags, with the person effect integrated out. Differences in the probability of being dissatisfied with life (percentage points) with respect to never being poor, averaged over 5,000 randomly drawn individuals; shaded areas are 95% intervals from 200 draws of the coefficients (standard errors clustered at the individual level).

In the poverty equation, dissatisfaction with life raises the probability of being poor one and two years later (0.061 and 0.045), but not three years later. Figure 4 translates this feedback into total effects, imposing histories of dissatisfaction and letting poverty evolve through its own lags. Unlike in Figure 3, the lines start at zero given that dissatisfaction is not allowed to affect poverty in the same year, so its first effect appears one year later. One year of dissatisfaction raises the probability of being poor by about 0.55 percentage points in each of the following two years. The effect then fades, but more slowly than the effect of poverty on dissatisfaction, because poverty itself is persistent: it is 0.19 points in the fifth year and has vanished after ten. Permanent dissatisfaction raises the probability of being poor by about 2 percentage points (95% interval of 1.2 to 3.4 after ten years), on a baseline of about 11 percent. Low satisfaction with life can thus be added to the explanations of the persistence of poverty.

Figure 4. Total effect of dissatisfaction histories on the probability of being poor, Germany 1992–2018



Source: own calculations on SOEP v36. Simulated from the joint model in Table 2, column 6. Everybody starts not poor and not dissatisfied; the history of dissatisfaction shown is imposed from year 1 onwards and poverty evolves through its own lags, with the person effect integrated out. Differences in the probability of being poor (percentage points) with respect to never being dissatisfied, averaged over 5,000 randomly drawn individuals; shaded areas are 95% intervals from 200 draws of the coefficients (standard errors clustered at the individual level).

4.2 Accumulation and repeated poverty spells

Table 3 tests directly whether the effects build up with the number of years spent in each state. It replaces all the lags of both outcomes by dummies for the number of years spent in poverty and the number of years dissatisfied with life in the previous one, two and three years, without (columns 1 to 3) and with current poverty (columns 4 to 6).¹⁴ If the effect of poverty on life satisfaction accumulated, the coefficients would grow with the number of poor years. They do not: in column 6, having been poor in one of the previous three years raises the probability of being dissatisfied (0.069), whereas two or three poor years add less (0.030 and 0.010, neither significant; three years against one: $p = 0.023$). Someone who is poor now and was poor in each of the previous three years is thus no more likely to be dissatisfied than someone who has just become poor ($0.107 + 0.010$, against 0.107). The same holds in the other direction: one, two or three years of dissatisfaction raise the probability of being poor by similar amounts (0.055, 0.082 and 0.081; $p = 0.50$ for equality). Within each equation, by contrast, the number of past years in the same state matters a great deal (0.47, 0.77 and 1.10 for dissatisfaction; 0.81, 1.15

¹⁴ Note that with one past year, the models are those of columns (1) and (4) in Table 2.

and 1.56 for poverty). Both outcomes are persistent, but the effect of one on the other does not accumulate. What matters is how recent poverty or dissatisfaction is, not how many years of it there were. This is the no-accumulation component of resilience: dissatisfaction does not build up with the years spent in poverty. The model with separate lags of Table 2 fits the data much better (log likelihood of $-130,231$ against $-130,984$, with the same number of parameters) which is why it is my preferred specification.¹⁵

A further test concerns repeated spells. Watson and Osberg (2017) find that men recover from isolated episodes of economic insecurity but not from repeated ones. Clark et al. (2021), in contrast, find that a given number of years with a major financial worsening has the same association with life satisfaction whether these years came in one continuous spell or were interrupted. Table 4 follows Clark et al. (2016) and estimates a fixed-effects regression of being dissatisfied with life with separate dummies for each year in a poverty spell and each year after it has ended, for first and for repeat spells, which are shown side by side. The last column tests whether each year of a repeat spell differs from the same year of the first spell. The results indicate that the effect of poverty on dissatisfaction is similar whether individuals are in their first spell or in a repeat spell. The same is true for the years after the spell has ended, except in the second year out of poverty, when the difference between first and repeat spells is significant ($p = 0.034$). I offer an explanation below on this.

Regarding the tests at the bottom of the table, test [1] checks whether, taken together, the four years in a repeat spell differ from the same four years in a first spell. Being poor for a second or later time raises the probability of being dissatisfied with life as much as the first time, and no more ($p = 0.75$). Poverty hurts each time, but repeated spells do not wear people down: this is the robustness component of resilience. Test [2] does the same for the four years after the spell has ended, and so asks whether repeated spells make it harder to recover. They do not: recovery is at least as good after a repeat spell as after a first one. The joint test is borderline ($p = 0.06$), but the differences point to faster, not slower, recovery. This should not be read as poverty making people stronger, since those who leave a repeat spell for good may be people whose circumstances were improving anyway. What matters for resilience is that people recover fully once they leave poverty, however many times they have been poor: repeated spells wear down neither their well-being while poor nor their capacity to recover.

¹⁵ The results are the same when only one of the two outcomes is counted and the lags of the other are kept. Results not shown but available from the author upon request.

Table 3. Accumulated past years in poverty and of dissatisfaction: joint dynamic random-effects probits, Germany 1992–2018

	Without current poverty			With current poverty		
	1 past year (1)	2 past years (2)	3 past years (3)	1 past year (4)	2 past years (5)	3 past years (6)
Dissatisfaction equation (d)						
1 year dissatisfied	0.582*** (0.012)	0.505*** (0.013)	0.471*** (0.014)	0.581*** (0.012)	0.503*** (0.013)	0.470*** (0.013)
2 years dissatisfied		0.911*** (0.020)	0.771*** (0.020)		0.909*** (0.020)	0.768*** (0.020)
3 years dissatisfied			1.100*** (0.028)			1.096*** (0.028)
p(t)				0.094*** (0.015)	0.101*** (0.016)	0.107*** (0.018)
1 year in poverty	0.122*** (0.015)	0.084*** (0.016)	0.073*** (0.017)	0.104*** (0.015)	0.074*** (0.016)	0.069*** (0.017)
2 years in poverty		0.059*** (0.021)	0.044* (0.023)		0.037* (0.022)	0.030 (0.023)
3 years in poverty			0.032 (0.027)			0.010 (0.028)
Poverty equation (p)						
1 year in poverty	0.966*** (0.013)	0.846*** (0.014)	0.806*** (0.016)	0.966*** (0.013)	0.845*** (0.014)	0.805*** (0.016)
2 years in poverty		1.358*** (0.019)	1.151*** (0.020)		1.357*** (0.019)	1.150*** (0.020)
3 years in poverty			1.560*** (0.024)			1.558*** (0.024)
1 year dissatisfied	0.089*** (0.016)	0.067*** (0.016)	0.041** (0.017)	0.100*** (0.016)	0.080*** (0.016)	0.055*** (0.017)
2 years dissatisfied		0.079*** (0.026)	0.058** (0.026)		0.101*** (0.026)	0.082*** (0.026)
3 years dissatisfied			0.049 (0.037)			0.081** (0.037)
σ_1 , person effect in d	0.762*** (0.008)	0.665*** (0.009)	0.612*** (0.010)	0.762*** (0.008)	0.665*** (0.009)	0.611*** (0.010)
σ_2 , person effect in p	0.803*** (0.010)	0.670*** (0.010)	0.637*** (0.011)	0.802*** (0.010)	0.670*** (0.010)	0.637*** (0.011)
ρ	0.166*** (0.013)	0.195*** (0.017)	0.204*** (0.020)	0.133*** (0.014)	0.152*** (0.018)	0.150*** (0.022)
Person-years	428,588	378,880	337,953	428,588	378,880	337,953
Individuals	55,234	46,629	41,594	55,234	46,629	41,594

Source: own calculations on SOEP v36, adults, 1992–2018. Joint dynamic random-effects probits for being dissatisfied with life (d, life satisfaction of 4 or less) and poor (p, equivalised household income below 60% of the median), as in Table 2, with the lags of both outcomes replaced in both equations by dummies for the number of years in poverty and the number of years dissatisfied in the previous one, two or three years (reference: none). ‘1, 2, 3 years in poverty (dissatisfied)’ : number of poor (dissatisfied) years among the previous one, two or three years. With one past year, this is the model with one lag of Table 2. Both equations include as initial conditions the values of d and p in the one, two and three years before each person's first observation in the estimation sample, one for each lag (Wooldridge, 2005); their coefficients are not shown. Both equations also include gender, age groups, marital status, education, labour-force status, East Germany, number of children, year dummies and the person

means of the time-varying variables (Mundlak, 1978). Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 4. Dissatisfaction with life in and after first and repeat poverty spells, Germany, 1992–2018 (fixed-effects linear probability model, x 100)

	First spell (1)	Repeat spell (2)	p, repeat = first (3)
In the spell			
1st year in poverty (year of entry)	1.95*** (0.38)	2.75*** (0.62)	0.218
2nd year in poverty	3.05*** (0.66)	3.94*** (0.93)	0.418
3rd year in poverty	3.23*** (0.91)	4.26*** (1.18)	0.480
4th year in poverty or later	3.39*** (0.95)	3.63*** (1.12)	0.865
After the spell has ended			
1st year out of poverty	3.02*** (0.45)	3.86*** (0.76)	0.294
2nd year out of poverty	0.70 (0.49)	–1.24 (0.85)	0.034
3rd year out of poverty	–0.20 (0.53)	–1.68* (0.94)	0.145
4th year out of poverty or later	–0.70 (0.47)	–1.79** (0.82)	0.201
[1] In the spell: repeat = first, all four years (p)			0.746
[2] After the spell: repeat = first, all four years (p)			0.060
[3] No deepening: 4th year or later = 1st year in poverty (p)	0.131	0.432	
[4] Recovery: average effect, 2nd to 4th+ year out of poverty [95% interval]	–0.07 [–0.82, 0.69]	–1.57 [–2.86, –0.27]	
Number of spells -- entries	7,779	3,885	
Number of spells -- exits	5,705	2,623	
Person-years		383,466	
Individuals		52,926	

Source: own calculations on SOEP v36, 1992–2018. One fixed-effects regression with separate dummies for each year in and after a poverty spell, for first and for repeat (second or later) spells; reference: never poor and years before the first poverty entry. Years are counted from the year of entry (in a spell) or from the first year out of poverty (after a spell); the last category covers the fourth year and all later years. p, repeat = first: p-value of the test that the coefficient for a year of a repeat spell equals the one for the same year of the first spell. Spells are numbered over each person's whole observed poverty history; persons poor at their first observation are excluded, and observations after the first gap in a person's record are dropped. Controls: labour-force status, age groups, education, marital status, East Germany, number of children, year dummies. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Test [3] checks whether dissatisfaction builds up the longer people remain poor, by comparing the fourth and later years of a spell with the first. The difference is not significant, either in first spells (p = 0.13) or in repeat spells (p = 0.43): poverty hurts while it lasts, but the damage does not build up significantly over time. Finally, test [4] measures recovery over time. It averages

the coefficients for the second, third and fourth or later years out of poverty, which measure how much more likely people are to be dissatisfied than before the spell. After a first spell this average is -0.07 points (95% interval -0.82 to 0.69): once out of poverty, people are on average no more likely to be dissatisfied than before, and any remaining effect is small compared with the 3.0 points in the year of exit. After a repeat spell the average is even negative (-1.57 points; 95% interval -2.86 to -0.27): from the second year out of poverty, those who leave a repeat spell are less likely to be dissatisfied than before they first became poor. This more likely reflects that those who leave a repeat spell for good are people whose circumstances were improving than an effect of poverty itself, but it shows no sign of lasting damage after repeat spells either. Taken together, the tests are consistent with resilience through recovery and robustness rather than resistance: poverty does hurt, but there is little sign that its effect builds up, outlasts the spell or grows with repeated spells.

4.3 Robustness checks

Table 5 re-estimates the main model changing one element at a time. It presents the results focusing on the feedback effects given that the estimates for state dependence are extremely robust across models. The first row presents the results of the main specification in Table 2 to ease comparison. The pattern holds in every specification: current and last year's poverty raise the probability of being dissatisfied with life, poverty two and three years back does not, and dissatisfaction raises the probability of being poor for one or two years.

In panel [2], I present the results when using life satisfaction on its full 0-10 scale: poverty lowers it by 0.13 points in the current year and by 0.11 points in the previous one, with small positive coefficients afterwards. Higher life satisfaction lowers later poverty in all three years. The pattern is the same with a stricter (life satisfaction of 3 or less) or a looser (5 or less) definition of dissatisfaction – see panels [3] and [4]. Leaving out incomes close to the poverty line, so that every entry and exit is a move across the whole band between 54% and 66% of the median, raises the effect of last year's poverty on dissatisfaction to 0.18, which suggests that the main estimates are attenuated by small changes in incomes near the poverty line (panel [5]). Extreme poverty (below 40% of the median) gives a similar pattern – see panel [6]. Dating poverty as Clark et al. (2016) do shifts the coefficients by one year, as expected, and makes the feedback larger, because poverty and lagged dissatisfaction then refer to the same calendar year (panel [7]). The results do not change for West Germany since 1985 while using a region-specific poverty line (panel [8]) or without the special samples (panel [9]). When excluding controls for labour-force status, marital status and the number of children, which can themselves

be consequences of poverty (Biewen, 2009), the effects are about 50% larger in both directions and follow the same pattern, so the main specification is the conservative one (panel [10]). In panel [11], I estimate the main model with five lags. The feedback effects at four and five lags are not significant, indicating that feedback beyond three years is negligible: the three-lag specification captures the relevant persistence of both outcomes and the feedback between them, and adding longer lags does not change the results.

Table A1 in the Appendix gathers further checks of the joint model. The results do not change with the square-root equivalence scale, with separate poverty lines for East and West Germany, or when the period starts in 1985. In all three analyses, current and last year's poverty raise the probability of being dissatisfied, and dissatisfaction raises the probability of being poor one and two years later. See panels [2] to [4]. Clustering the standard errors by original household instead of at the individual level barely changes them (panel [5]). Allowing the yearly error terms of the two equations to be correlated changes nothing once current poverty is left out of the dissatisfaction equation (correlation of 0.07) – see panel [6].¹⁶ Finally, the results on feedback effects are very similar for women and men (panels [7] and [8]). The effects of current and last year's poverty are somewhat larger for women (0.103 and 0.128, against 0.075 and 0.077), but the differences are not significant ($p = 0.43$ and 0.16). Earlier poverty has no effect for either. The feedback from dissatisfaction to poverty acts after one year for women and after two years for men, with a total effect similar for both groups.

¹⁶ With current poverty included, its effect cannot be separated from such correlation without an exclusion restriction (Mourifié and Méango, 2014).

Table 5. Robustness checks: key coefficients of the joint model under alternative specifications

	Effect of poverty on dissatisfaction with life				Effect of dissatisfaction on poverty			Person-years (8)
	p(t) (1)	p(t-1) (2)	p(t-2) (3)	p(t-3) (4)	d(t-1) (5)	d(t-2) (6)	d(t-3) (7)	
[1] Main specification	0.091*** (0.017)	0.107*** (0.017)	-0.043** (0.017)	-0.026 (0.017)	0.061*** (0.017)	0.045** (0.018)	0.017 (0.018)	337,953
[2] Life satisfaction 0-10 (linear; points)	-0.129*** (0.012)	-0.105*** (0.013)	0.029** (0.012)	0.024** (0.012)	-0.024*** (0.004)	-0.016*** (0.004)	-0.012*** (0.003)	337,953
[3] Dissatisfied: life satisfaction 3 or less	0.113*** (0.021)	0.103*** (0.021)	-0.054*** (0.021)	-0.045** (0.020)	0.096*** (0.021)	0.024 (0.023)	0.061*** (0.022)	337,953
[4] Dissatisfied: life satisfaction 5 or less	0.107*** (0.014)	0.088*** (0.014)	-0.013 (0.014)	-0.019 (0.014)	0.035*** (0.013)	0.043*** (0.013)	0.035*** (0.013)	337,953
[5] Incomes 54-66% of the median out	0.120*** (0.031)	0.184*** (0.033)	-0.048 (0.033)	-0.057* (0.031)	0.077*** (0.028)	0.031 (0.029)	-0.008 (0.028)	279,263
[6] Extreme poverty, 40% of the median	0.097*** (0.028)	0.143*** (0.028)	-0.052* (0.028)	-0.028 (0.028)	0.064*** (0.025)	0.045* (0.026)	-0.012 (0.026)	337,953
[7] Clark et al. timing (waves to 2019)	0.127*** (0.016)	-0.037** (0.016)	-0.010 (0.016)	-0.011 (0.016)	0.136*** (0.017)	0.040** (0.016)	0.031* (0.017)	379,894
[8] West Germany, 1985-2018	0.077*** (0.019)	0.103*** (0.019)	-0.025 (0.019)	-0.012 (0.019)	0.055*** (0.019)	0.008 (0.020)	0.021 (0.020)	283,729
[9] Without the special samples	0.098*** (0.018)	0.110*** (0.018)	-0.045** (0.018)	-0.034* (0.018)	0.054*** (0.018)	0.047** (0.019)	0.015 (0.018)	312,446
[10] Without most covariates	0.143*** (0.017)	0.148*** (0.017)	-0.035** (0.017)	-0.022 (0.017)	0.092*** (0.017)	0.061*** (0.018)	0.029* (0.017)	337,953
[11] Five lags	0.092*** (0.020)	0.128*** (0.020)	-0.048** (0.020)	-0.040** (0.020)	0.050** (0.020)	0.043** (0.020)	0.020 (0.020)	270,426

Source: own calculations on SOEP v36. Each row is the joint model of Table 2, column 6 (three lags, current poverty), changing one element. Coefficients (probit) with standard errors clustered at the individual level in parentheses. [2] Life satisfaction 0-10: linear equation for life satisfaction, coefficients in points (negative = lower satisfaction) and the feedback from higher life satisfaction (negative = lower poverty). [5] Person-years with income between 54% and 66% of the median, close to the poverty line, are left out, and a person-year is used only if it and the three previous years are all outside that band, so that every entry into or exit from poverty is a move across the whole band. [7] Clark et al. timing: poverty measured with the income reported in the same interview (previous calendar year), so p(t) refers to the year before the interview. [8] West Germany: person-years in West Germany, with a West German poverty line. [9] Without the special samples: oversampled groups (high income, low-income families, single parents, refugees and others) left out. [10] Excludes the controls for labour-force status, marital status and number of children. [11] Five lags: coefficients of t-4 and t-5 not shown. *** p<0.01, ** p<0.05, * p<0.1.

5 Mechanisms

The results so far show two links between poverty and dissatisfaction with life: poverty raises dissatisfaction while it lasts and shortly after, without lasting damage, and dissatisfaction raises the risk of poverty in the following one or two years. This section explores what lies behind each of them. For the effect of poverty on dissatisfaction, it asks what poverty hurts, and whether everything recovers once poverty ends; whether the effect that lingers in the first years after poverty works through the fear of being poor again; and whether recovery is shared by all or limited to some people or some kinds of poverty spells. For the effect of dissatisfaction on poverty, it asks through which channels low well-being may reduce income-generating capacity: employment and working hours, earnings, health, and household dissolution. Because these questions involve variables that are not available in every year, or that would add many equations to the joint model, I use fixed-effects regressions, as in Clark et al. (2016), on the main sample with three complete lags.¹⁷ The results describe associations that help interpret the main findings, not causal mechanisms.

Table 6. What does poverty hurt? Life satisfaction and domain satisfactions (0–10), Germany 1992–2018 (fixed-effects regressions)

	Life satisfaction (1)	Household income (2)	Dwelling (3)	Health (4)	Job (employed) (5)	Leisure (6)
Poor in t	–0.160*** (0.013)	–0.410*** (0.016)	–0.050*** (0.015)	–0.089*** (0.015)	–0.242*** (0.028)	0.032* (0.017)
Poor in t-1	–0.151*** (0.013)	–0.513*** (0.017)	–0.097*** (0.015)	–0.072*** (0.014)	–0.092*** (0.028)	0.002 (0.017)
Poor in t-2	–0.037*** (0.012)	–0.169*** (0.015)	–0.061*** (0.014)	–0.011 (0.014)	0.026 (0.025)	–0.011 (0.016)
Poor in t-3	–0.021* (0.012)	–0.129*** (0.015)	–0.088*** (0.015)	–0.018 (0.014)	–0.008 (0.025)	–0.006 (0.016)
Observations	337,953	334,872	336,918	337,426	205,353	323,415
Individuals	41,594	41,481	41,555	41,581	31,929	41,040

Source: own calculations on SOEP v36, main sample 1992–2018, person-years with three complete lags. Fixed-effects linear regressions of satisfaction (0–10) with each domain; standard errors clustered at the individual level. Controls: labour-force status, age groups, education, marital status, East Germany, number of children and wave dummies. Job satisfaction only for the employed; leisure satisfaction was not asked in 1995. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6 compares overall life satisfaction with five domain satisfactions. Poverty lowers satisfaction with household income most: by 0.41 points when the person is poor in the current year and by 0.51 points when they were poor in the previous year, followed by job satisfaction among the employed, health and the dwelling. Satisfaction with leisure is unaffected. The

¹⁷ Results by Clark et al. (2016) are closely reproduced in the data at hand.

domains differ in how they recover. Satisfaction with health and with the job returns to its previous level within one or two years, as overall life satisfaction does. Satisfaction with household income and with the dwelling, in contrast, is still lower two and three years after poverty (-0.17 and -0.13 points for income, -0.06 and -0.09 for the dwelling). People thus remain dissatisfied with their material situation for some years, while their evaluation of their life as a whole recovers. This is the kind of resilience the paper documents: not the absence of material hardship or of its perception, but the ability to recover a positive evaluation of life as a whole.

Knabe and Rätzel (2011) show that the lasting effect of unemployment on life satisfaction works through the fear of becoming unemployed again. The SOEP asks every year how worried people are about their own economic situation. Among those who are no longer poor, having been poor last year raises the probability of having big worries by 5.5 percentage points and having been poor two years ago by 1.5 points, while poverty three years ago has no effect (Table A2 in the Appendix). The fear of falling back into poverty thus lingers for about two years, the same period over which past poverty affects dissatisfaction, and it accounts for about 18% of the effect of last year's poverty on dissatisfaction (14% in the joint model). Since worries and life satisfaction are reported in the same interview, this is a pattern of association rather than a causal decomposition.

Recovery is broadly shared (Tables A3 and A4 in the Appendix). People with high neuroticism are hit harder while poor (1.4 percentage points more likely to be dissatisfied in the year of poverty) but recover like everyone else ($p = 0.20$), and an internal locus of control makes no significant difference ($p = 0.14$). Poverty that starts with a job loss or a separation hurts more: once the event has taken place, those who entered poverty this way are 4 to 5 percentage points more likely to be dissatisfied than those who entered for other reasons, whereas poverty that starts at retirement hurts less (joint test, $p = 0.002$). The cause of entry therefore matters for how hard poverty hits, although the table cannot tell whether these entries also take longer to recover from. The poverty rate of the federal state does not change the effect of poverty, so I find no evidence that poverty hurts less where it is more common. Lastly, deeper poverty hurts more in the year of poverty and the year after, but it leaves no trace after two years either.

Dissatisfaction with life is followed by changes that reduce income-generating capacity – see Table 7. Controlling for past poverty, those who were dissatisfied in the previous year are 2.5 percentage points more likely to be registered unemployed, on a mean of 4.9 percent, and 2.8

points less likely to be employed. They work 1.1 fewer hours a week, and, when employed, earn about 3.5 percent less. They are also 5.6 points more likely to report poor or bad health, and, if married, about twice as likely to separate. Dissatisfaction two and three years back points in the same direction, with smaller effects. Consistent with this, Table A5, which assigns every poverty entry to its main cause (Bane and Ellwood, 1986; Jenkins, 2000), shows that entries that follow a year of dissatisfaction start more often with a job loss (8.4 against 5.8 percent of those that follow a satisfied year) and with a fall in public transfers (23.3 against 15.6 percent). In both groups, most entries come from falls in income rather than from changes in the household. These associations do not establish causality, since dissatisfaction may partly anticipate a job loss or reflect an illness that also lowers income, but they point to the labour market, health and household dissolution as channels through which low well-being raises the risk of poverty.

Table 7. Dissatisfaction with life and later employment, earnings, health and household dissolution, Germany 1992–2018 (fixed-effects regressions)

	Unemployed (x 100)	Employed (x 100)	Weekly working hours	Log gross earnings (employed)	Poor or bad health (x 100)	Separated or divorced, if married in t-1 (x 100)
	(1)	(2)	(3)	(4)	(5)	(6)
Dissatisfied in t-1	2.45*** (0.23)	-2.75*** (0.29)	-1.10*** (0.12)	-0.035*** (0.005)	5.55*** (0.32)	0.91*** (0.13)
Dissatisfied in t-2	0.69*** (0.21)	-1.70*** (0.28)	-0.64*** (0.11)	-0.023*** (0.005)	3.20*** (0.32)	0.25** (0.11)
Dissatisfied in t-3	0.47** (0.21)	-1.49*** (0.28)	-0.62*** (0.12)	-0.019*** (0.005)	2.13*** (0.31)	0.23** (0.11)
Poor in t-1	4.69*** (0.29)	-8.93*** (0.36)	-3.96*** (0.14)	-0.217*** (0.009)	1.44*** (0.30)	2.83*** (0.21)
Poor in t-2	0.91*** (0.24)	-1.85*** (0.30)	-1.06*** (0.12)	-0.075*** (0.008)	0.12 (0.29)	-0.51*** (0.12)
Poor in t-3	-0.04 (0.24)	-0.40 (0.31)	-0.27** (0.12)	-0.056*** (0.007)	-0.28 (0.29)	-0.33*** (0.11)
Dissatisfied in t-1 to t-3 jointly = 0 (p)	0.000	0.000	0.000	0.000	0.000	0.000
Mean of the outcome	4.93	59.65	22.15	7.520	17.99	0.83
Person-years	337,953	337,953	330,813	200,721	330,580	222,422

Source: own calculations on SOEP v36, main sample 1992–2018, person-years with three complete lags. Fixed-effects regressions of each outcome in t on being dissatisfied with life (life satisfaction of 4 or less) in t-1, t-2 and t-3, controlling for poverty in t-1, t-2 and t-3, age groups, education, East Germany and year dummies; labour-force status, marital status and children are left out because they are among the outcomes. Unemployed: registered unemployed; weekly hours: actual hours, 0 if not employed; earnings: gross monthly labour earnings of the employed; health: self-rated health poor or bad (4 or 5 on a 1–5 scale); separation: separated or divorced in t among those married in t-1. Standard errors clustered at the individual level in parentheses. Associations, not causal effects. *** p<0.01, ** p<0.05, * p<0.1.

6 Conclusions

This paper has studied the two-way relationship between poverty and dissatisfaction with life in Germany between 1992 and 2018, using joint dynamic random-effects models that account for state dependence in both processes, feedback in both directions, unobserved heterogeneity and initial conditions.

Poverty hurts while it lasts. Being poor raises the probability of being dissatisfied with life in that year and the next, and permanent poverty raises it year after year, so people do not adapt to poverty, in line with Clark et al. (2016). But the damage neither accumulates nor outlasts the spell: dissatisfaction does not grow with the number of years in poverty, people return to their previous level of life satisfaction within two years of leaving poverty, and they do so after repeated spells as well as after a first one. Recovery is broadly shared across personality traits, although poverty that starts with a job loss or a separation hurts more. I interpret this combination as psychological resilience to poverty, in the sense of recovery and robustness rather than resistance.

What recovers is the overall evaluation of life, not satisfaction with the material situation: satisfaction with household income and housing remains lower for several years after poverty ends. Part of the effect of last year's poverty on psychological distress goes together with the fear of being poor again, which also fades within two years. This contrasts with the lasting scars documented for unemployment (Clark and Lepinteur, 2026), whose persistence Knabe and Rätzel (2011) relate to the fear of future unemployment.

In the other direction, dissatisfaction with life raises the probability of being poor for about two years and, through the persistence of poverty, its effect fades over about five years. Low satisfaction with life is therefore one of the ingredients of the persistence of poverty, although a modest one.

These results do not mean that poverty matters less. Poverty hurts in every year it lasts, and the absence of adaptation means that long spells accumulate losses in well-being even if they do not leave psychological scars. The fact that poor individuals show a certain degree of resilience does not mean that social policy should worry less about them: shortening poverty spells, and weakening the feedback by which low well-being keeps people poor, is where policy can make a difference. The analysis has limitations. It ends in 2018, before the pandemic; the mechanisms are associations, not causal effects; and life satisfaction is a single-item measure. Future research could study whether the same resilience is found in other countries and for other

dimensions of well-being, such as mental health, and how policies that shorten poverty spells affect the feedback from well-being to poverty.

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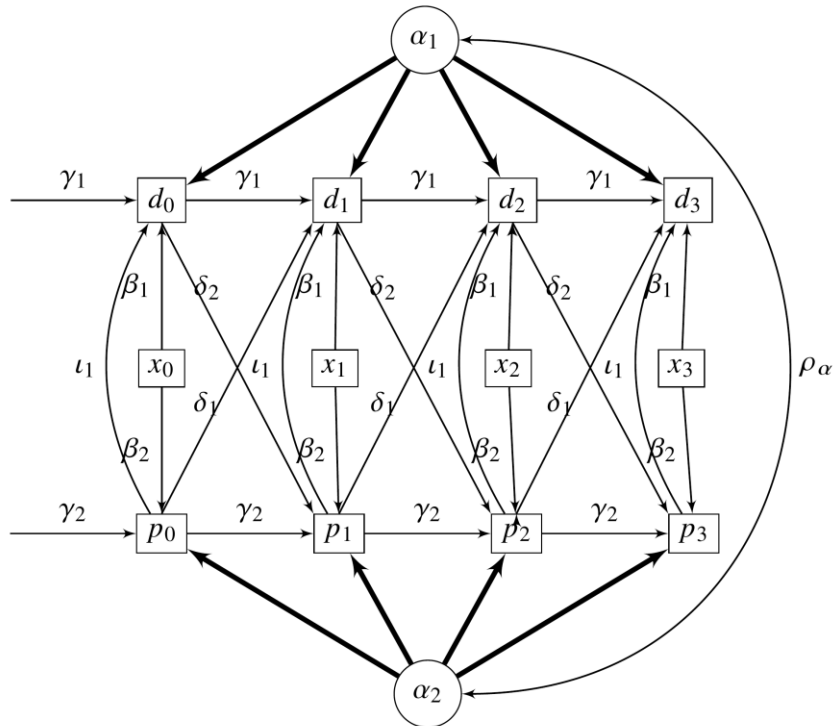
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Appendix

Figure A1. Data-generating mechanism of the joint model for dissatisfaction with life (d) and poverty (p), first-order model



Note: see Section 3 for the notation. The figure shows the first-order model from $t = 0$ to $t = 3$; the estimated models include up to three lags of each outcome, with the initial conditions described in Section 3.

Table A1. Further robustness checks: key coefficients of the joint model, Germany, 1992–2018

	Effect of poverty on dissatisfaction				Effect of dissatisfaction on poverty			Correlation of		Person- years
	p(t)	p(t-1)	p(t-2)	p(t-3)	d(t-1)	d(t-2)	d(t-3)	person effects	error terms	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
[1] Main specification	0.091*** (0.017)	0.107*** (0.017)	-0.043** (0.017)	-0.026 (0.017)	0.061*** (0.017)	0.045** (0.018)	0.017 (0.018)	0.155*** (0.022)		337,953
[2] Square-root equivalence scale	0.087*** (0.017)	0.081*** (0.018)	-0.011 (0.017)	-0.045*** (0.017)	0.050*** (0.018)	0.034* (0.018)	0.023 (0.018)	0.170*** (0.022)		338,932
[3] East and West poverty lines	0.102*** (0.017)	0.096*** (0.018)	-0.024 (0.018)	-0.043** (0.018)	0.065*** (0.018)	0.045** (0.018)	0.011 (0.018)	0.161*** (0.022)		337,953
[4] Period 1985–2018	0.089*** (0.016)	0.101*** (0.016)	-0.042** (0.016)	-0.014 (0.016)	0.057*** (0.016)	0.038** (0.017)	0.019 (0.016)	0.159*** (0.021)		375,352
[5] Std. err. clustered by household	0.091*** (0.019)	0.107*** (0.018)	-0.043** (0.018)	-0.026 (0.018)	0.061*** (0.018)	0.045** (0.019)	0.017 (0.019)	0.155*** (0.023)		337,953
[6] Without p(t), correlated errors		0.141*** (0.017)	-0.027 (0.017)	-0.016 (0.017)	0.070*** (0.018)	0.052*** (0.018)	0.022 (0.018)	0.149*** (0.021)	0.069*** (0.009)	337,953
[7] Men	0.075*** (0.027)	0.077*** (0.027)	-0.037 (0.028)	-0.029 (0.027)	0.029 (0.027)	0.088*** (0.028)	0.026 (0.027)	0.145*** (0.032)		159,526
[8] Women	0.103*** (0.023)	0.128*** (0.023)	-0.047** (0.022)	-0.024 (0.022)	0.085*** (0.023)	0.015 (0.024)	0.011 (0.023)	0.152*** (0.030)		178,427

Source: own calculations on SOEP v36. Each row is the joint model of Table 2, column 6 (three lags, current poverty), changing one element; coefficients of the probits for being dissatisfied with life (d) and poor (p), with standard errors clustered at the individual level in parentheses unless stated. [2] Square-root equivalence scale: household income divided by the square root of household size, instead of the modified OECD scale. [3] Separate East and West German poverty lines: 60% of the median in each part of the country. [4] Period 1985–2018: all years from 1985, so that before 1992 only West German households contribute. [5] Standard errors clustered by original household: the SOEP original household, in which persons are nested over time. [6] Correlated error terms: the yearly error terms of the two equations are allowed to be correlated, in addition to the person effects. [7] and [8] Men and women: separate models, without the gender dummy; p-values of the differences between women and men: p(t) 0.43, p(t-1) 0.16, p(t-2) 0.79, p(t-3) 0.88; d(t-1) 0.11, d(t-2) 0.05, d(t-3) 0.68. *** p<0.01, ** p<0.05, * p<0.1.

Table A2. Past poverty, worries about own economic situation and dissatisfaction with life, Germany, 1992–2018 (fixed-effects regressions)

	Dissatisfied x 100 (1)	Dissatisfied x 100, with worries (2)	Big worries x 100 (3)	Big worries x 100, not poor in t (4)
Poor in t	2.01*** (0.27)	1.65*** (0.27)	3.74*** (0.36)	
Poor in t-1	2.30*** (0.26)	1.88*** (0.26)	4.39*** (0.35)	5.48*** (0.46)
Poor in t-2	0.21 (0.25)	0.07 (0.25)	1.49*** (0.33)	1.52*** (0.42)
Poor in t-3	0.16 (0.25)	0.14 (0.25)	0.08 (0.33)	0.10 (0.39)
Big worries		10.12*** (0.23)		
Some worries		1.41*** (0.11)		
Observations	336,745	336,745	336,745	302,549
Individuals	41,556	41,556	41,556	39,527
Share of the p(t-1) effect that goes with worries (col. 1 vs 2)		0.18		

Source: own calculations on SOEP v36, main sample 1992–2018, person-years with three complete lags. Fixed-effects linear probability models. The outcomes are dummies multiplied by 100 (x 100), so that coefficients are in percentage points: being dissatisfied with life (life satisfaction of 4 or less) in columns (1) and (2), and having big worries about one's own economic situation in columns (3) and (4); column (4) is restricted to individuals who are not poor in t. Worries: 'How concerned are you about your own economic situation?' (big, some, no worries; reference: no worries). All regressions include labour-force status, age groups, education, marital status, East Germany, number of children and wave dummies. Worries and life satisfaction are reported in the same interview, so column (2) describes how much of the poverty effect goes together with economic worries, not a causal decomposition. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A3. Who recovers? Poverty, dissatisfaction with life and personality, Germany, 1992–2018 (fixed-effects regressions)

	Neuroticism sample (1)	Neuroticism sample, interacted with high neuroticism (2)	Locus of control sample (3)	Locus of control sample, interacted with high internal locus of control (4)
Poor in t	1.95*** (0.28)	1.26*** (0.34)	1.93*** (0.28)	2.18*** (0.38)
Poor in t-1	2.21*** (0.27)	1.88*** (0.34)	2.19*** (0.27)	2.50*** (0.37)
Poor in t-2	0.41 (0.26)	0.52 (0.33)	0.37 (0.26)	0.32 (0.35)
Poor in t-3	0.16 (0.26)	−0.28 (0.32)	0.15 (0.26)	−0.16 (0.36)
Poor in t x high neuroticism		1.41** (0.57)		
Poor in t-1 x high neuroticism		0.68 (0.55)		
Poor in t-2 x high neuroticism		−0.24 (0.53)		
Poor in t-3 x high neuroticism		0.92* (0.53)		
Poor in t x high internal LoC				−0.68 (0.55)
Poor in t-1 x high internal LoC				−0.87 (0.53)
Poor in t-2 x high internal LoC				0.10 (0.51)
Poor in t-3 x high internal LoC				0.82 (0.50)
Past poverty x high trait, jointly = 0 (p)		0.199		0.135
Observations	306,952	306,952	306,208	306,208
Individuals	34,761	34,761	34,194	34,194

Source: own calculations on SOEP v36, main sample 1992–2018, person-years with three complete lags. Fixed-effects linear probability models of being dissatisfied with life (life satisfaction of 4 or less); the outcome is multiplied by 100, so coefficients are in percentage points. Columns (1) and (3): all persons with a valid score for the trait, whatever its value, without interactions. Columns (2) and (4): poverty in t to t−3 is also interacted with a dummy for scoring above the sample median of the trait ('high'); the poverty coefficients then refer to persons at or below the median, and the interactions give the difference for those above it. Neuroticism: mean of the three neuroticism items of the short Big Five Inventory (BFI-S) on a 1–7 scale: worries a lot, gets nervous easily and copes well with stress (the last reversed). Internal locus of control: mean of eight items on a 1–7 scale, two internal (how my life goes depends on me; success is the result of hard work) and six external, which are reversed (I have not achieved what I deserve; what one achieves depends mainly on luck; others have a controlling influence over my life; I doubt my abilities when I meet difficulties; my opportunities are determined by social conditions; I have little control over what happens in my life); a score requires at least six valid items. Each trait is taken from the person's first valid measurement (2005 or later) and treated as fixed over 1992–2018; such traits are fairly stable in adulthood, but for earlier years they are measured after the poverty spells. The main effects of the traits are absorbed by the individual fixed effects. Joint test: p-value of the test that the three interactions of the trait with

past poverty (t-1 to t-3) are all zero. Controls as in Table A2. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A4. How poverty starts, other people's poverty and depth of poverty, Germany, 1992–2018 (fixed-effects regressions)

	Probability of being dissatisfied with life at t		
	How poverty starts (1)	Other people's poverty (2)	Depth of poverty (3)
Poor in t	2.01*** (0.29)	1.98*** (0.27)	1.06*** (0.34)
Poor in t-1	1.99*** (0.27)	2.33*** (0.27)	0.87*** (0.33)
Poor in t-2	0.21 (0.25)	0.21 (0.25)	−0.04 (0.32)
Poor in t-3	0.18 (0.25)	0.15 (0.25)	0.06 (0.32)
Poor in t x entered after job loss	1.03 (1.49)		
Poor in t-1 x job loss	4.23*** (1.60)		
Poor in t x entered after separation	1.52 (1.76)		
Poor in t-1 x separation	5.14*** (1.96)		
Poor in t x entered after a birth	−0.53 (1.08)		
Poor in t-1 x birth	−0.18 (1.11)		
Poor in t x entered at retirement	−3.37** (1.40)		
Poor in t-1 x retirement	0.28 (1.65)		
State poverty rate (pp, centred)		0.03 (0.03)	
Poor in t x state poverty rate		0.02 (0.07)	
Poor in t-1 x state poverty rate		−0.07 (0.07)	
Poverty gap in t			4.45*** (1.19)
Poverty gap in t-1			7.28*** (1.22)
Poverty gap in t-2			1.13 (1.14)
Poverty gap in t-3			0.27 (1.07)
Observations	337,953	337,953	335,764
Individuals	41,594	41,594	41,327
Joint test (p): col. 1 all trigger interactions = 0; col. 3 gap in t-1..t-3 = 0	0.002		0.000

Source: own calculations on SOEP v36, main sample 1992–2018, person-years with three complete lags. Fixed-effects linear probability models of being dissatisfied with life (life satisfaction of 4 or less); the outcome is multiplied by 100, so coefficients are in percentage points. (1) The event behind the most recent poverty entry,

dated between the interview of the year of entry and the next one, the period of the income and household that define poverty in that year: job loss (employed to registered unemployed), separation (married to separated or divorced), birth (more children under 2 in the household), retirement (to not working aged 65 or over); if more than one, the first in this order; reference: other entries. Because life satisfaction is reported early in the year, most of these events happen after the interview of the year of entry, so that their effect shows mainly in the interaction with poverty in $t-1$. (2) Weighted poverty rate of the federal state in the same calendar year, centred at its mean. (3) Normalised poverty gap, (poverty line – income)/poverty line, 0 if not poor. Joint test: p-value of the test that all the interactions with the events (column 1) or the poverty gaps in $t-1$ to $t-3$ (column 3) are zero. Controls: labour-force status, age groups, education, marital status, East Germany, number of children and wave dummies. Standard errors clustered at the individual level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A5. How people enter poverty: main event between t-1 and t, by dissatisfaction with life in t-1, Germany 1992–2018 (weighted %)

	Satisfied in t-1	Dissatisfied in t-1	All entries
Household events:			
Partner died	2.5	1.6	2.4
Partner left (separation)	3.8	3.9	3.8
Left the parental home	3.7	2.1	3.5
Birth (more children <2)	2.4	1.7	2.3
Another person moved in	1.4	1.4	1.4
Another person moved out	3.7	4.3	3.8
Other change of household	0.5	0.4	0.5
Income events (same household):			
Retirement	1.8	1.0	1.7
Own job loss	5.8	8.4	6.1
Lower own earnings (still working)	16.1	15.8	16.1
Lower earnings of other members	13.8	12.5	13.6
Lower public transfers	15.6	23.3	16.7
Lower pensions	17.8	14.2	17.3
Lower asset income or private transfers	9.0	8.0	8.9
Higher taxes	1.9	1.0	1.7
Poverty entries	10,783	1,581	12,364

Source: own calculations on SOEP v36, main sample 1992–2018, person-years with three complete lags. Poverty entries: poor in t (equivalised household income below 60% of the median) and not poor in t-1; dissatisfied: life satisfaction of 4 or less in t-1. Each entry is assigned one main event, hierarchically (Bane and Ellwood, 1986; Jenkins, 2000): first, if the household changed between t-1 and t, the household event, in the order listed; otherwise, the income component of the household with the largest fall in euros. Household and income are those that define poverty in each year, that is, the household at the following interview and the income of the calendar year. Own labour earnings falling to zero count as retirement if the person is 58 or older and household pensions rose, and as job loss otherwise. Pensions: public and private; taxes: income taxes and social security contributions. Shares weighted with the SOEP cross-sectional weights; counts unweighted. Pearson χ^2 test of independence between the event and dissatisfaction in t-1 (unweighted): $p < 0.001$.