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Broken Homes and Empty Pantries: French Households Suffer Substantial Loss of Standard of Living, Reduce Food Consumption and Lose Weight Following Separation

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Broken homes and empty pantries: French households suffer substantial loss of standard of living, reduce food consumption and lose weight following separation

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Abstract

This study sheds new light on the impact of couple separation on household living standards by considering the effects of separation on measures reflecting the adequacy of food consumption in addition to more commonly studied income and expenditure measures. Using an event study approach with panel data from France, I examine changes in household disposable income, food expenditure and food quantities purchased, diet quality and household member's body weight at the time of separation and up to eight years later, compared to a control group of households that did not separate. Disposable income, food expenditure and quantities purchased adjusted for household size fall by around 20%-25% after separation and until the end of the observation window. The ex-partner's body mass index (weight for height measure) falls by 1.5% in the first three years after separation and diet quality worsens. A possible interpretation of the results is that living standards fall to the point where households cannot maintain a minimum level of consumption to meet their dietary needs, resulting in measurable weight loss.

Keywords: Separation, divorce, living standards, income, food consumption, event study.

JEL codes: D12, J12

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1 Introduction

Family dissolution due to couple separation has become an event that a large part of the population will experience at some point in their lives. In France, the share of cohabiting couples who broke up their first union after less than eight years more than doubled, from 12% for unions formed in the 1970s to 29% for unions formed between 1997 and 2005 [INSEE, 2015]. A couple who married in 1970 has a 12% chance of ever getting divorced, compared to 44% for couples who married in 2014 [INSEE, 2016]. Trends are similar in many countries around the world [OCDE, 2011]. Separation has many consequences for those involved, especially financially. Divorce has been associated with a reduction in income (see for example McKeever and Wolfinger [2001], Avellar and Smock [2005], Tach and Eads [2015]). In France, for example, it is estimated that women's average standard of living drops by 25% in the year following a divorce [Costemalle, 2017].

Since separation means the end of the economies of scale associated with cohabitation and the sharing of certain expenses, a decline in living standards after separation is to be expected. What remains an open question, however, is the extent to which the income shock of separation affects households' ability to maintain a minimum level of consumption necessary to meet basic needs. The studies that look at the effect of separation on income provide information on relative changes in the financial situation, but not so much on whether households have difficulty meeting their basic needs in absolute terms. Households could vary in their ability to adapt to lower budgets by being more or less able to turn to less expensive options. The question of households' ability to maintain a minimum level of consumption is important. When households are unable to meet their basic needs, there can be costly negative impacts on human capital, such as poorer health. Lower economic resources have been associated with poorer adult and child outcomes, including poorer mental and physical health and lower educational attainment [McLanahan et al., 2013, Tach and Eads, 2015].

In this study, I seek to fill this gap in the literature by examining whether separation affects households' ability to meet basic consumption needs, focusing to this end on food consumption as an important basic necessity. More precisely, I estimate the effects of couple separation on household size-adjusted income, food expenditures and quantities purchased, diet quality, and body weight. Looking at quantity of food purchased, diet quality, and body weight is crucial because it is arguably more informative about whether households are having difficulty meeting their basic dietary needs than changes in income and even food expenditures would suggest. A fall in income and food expenditures does not necessarily signal a decrease in actual food consumption as households might be able to shop for bargains and substitute for cheaper products instead.

A major obstacle to studying this issue is the difficulty in obtaining individual-level data on household composition and income, as well as reliable and detailed data on food consumption. For this study, I use consumer panel data from *Kantar Worldpanel* for France, which include basic demographic information on household members, household composition, and detailed information on food purchases entered by households via scanners after each grocery purchase. In an event study approach, I examine how the outcome variables evolve in the years before and after the separation, relative to the period just before separation and compared to households where no separation is observed. I control for time-invariant differences across households and the impact of macro-level shocks by including household and year fixed effects. To identify the most vulnerable households and to study potential mechanisms of adaptation, I perform heterogeneity analyses by pre-separation income, family composition, and the employment status, subsequent relationship

status, and sex of the observed remaining spouse. I perform several robustness checks by selecting control households differently, omitting control households altogether and calculating estimates robust to effect heterogeneity, as proposed in the recent two-way fixed effects literature.

Several key findings emerge from my study. First, I find that families suffer significant and permanent losses of economic resources after separation. In the first year after separation, household-size-adjusted disposable income is around 20% lower relative to pre-separation levels and remains 25% lower until the end of the observation window up to seven years after the separation. Second, families are cutting back on food consumption. Household-composition-adjusted food expenditures and quantities purchased decline by 20% to 25% relative to pre-separation levels. Third, the changes in income and food consumption are accompanied by a 1.5% decline in the spouse's body mass index (BMI[1]) during the first three years after the separation. This weight loss occurs despite an increase in the share of unhealthy food purchases consisting of more salty, sweet, fatty and convenience foods, which are calorie-dense food products. Importantly, the effects on income and food purchases are not simply a mechanical consequence of the departure of a household member. If, instead of adjusting for household composition, I use per capita income and food purchases, the results are qualitatively equivalent. I find no effect when an adult other than the partner (for example an adult child) leaves the household. If the effect were simply a mechanical effect of a change in household size, I would effects for any household member leaving the household. Fourth, the effects on income are stronger in high-income households, but food purchases and body weight decline more strongly in low-income households, households with a female head and single-parent households. Labor market participation does not significantly mitigate the impact of separation, while finding a new partner does.

One possible interpretation of the results is that low-income households experience a decline in living standards after separation reaching a point where they cannot maintain a minimum level of consumption to meet their dietary needs. This result may come as a surprise. A priori, one could have expected that in countries with developed welfare systems such as France, the decline in living standards should be cushioned by public and private transfers in a way that at least avoids the worst consequences by allowing a minimum level of necessary consumption. Another possibility is that people simply prefer to lose weight after a separation, perhaps to increase their chances of finding a new partner. Separation could also lead to depression and loss of appetite, which could also explain the decrease in food consumption and weight loss. However, the greater reduction in food purchases and weight loss in low-income households, female-headed households, and single-parent households runs counter to this argument. Systematic differences in weight loss preferences between these groups might exist but it is likely that these differences are also ultimately driven by financial constraints and not due to some intrinsic and systematic differences in preferences for companionship. Spouses in low-income households and single parents might suffer more strongly from depression due to greater financial problems. They might also feel more financial pressure to regain their pre-separation standard of living by entering a new relationship and might lose weight to increase their chances in the dating market. Some households may in fact feel that they have limited options, given the findings of this study that labor market participation does not significantly mitigate the impact of separation, while finding a new partner does.

[1]BMI is defined as body weight divided by the square of the body height. It is a commonly used measured to standardize weight for height and a rule of thumb to broadly categorize a person as underweight, normal weight, overweight, or obese based on tissue mass (muscle, fat, and bone) and height. The results are qualitatively the same when using body weight directly.

The results are important from a policy perspective. Additional policy intervention to mitigate the effects in the most affected households could be justified on ethical grounds and to avoid the societal costs that could potentially arise from the negative effects associated with the inability to meet basic needs of nutrition. It may be argued that weight loss could have health benefits. However, an involuntary weight loss accompanied by a deterioration in diet quality is not healthy. An anticipation of declining living standards could also discourage some spouses from separating, even though they would have liked to do so. Separation in itself is not a negative event, but often necessary for the sake of mental health, sometimes also physical health. We could also be concerned that a subset of the most vulnerable people are under pressure to enter into a new relationships that they would not have entered into in the absence of financial constraints. To avoid the costs that could arise from the negative effects associated with the inability to meet basic nutritional needs, and to avoid situations of dependency that could lead people to enter and remain in potentially unhealthy relationships that may also result in significant personal and societal costs, I recommend that policy-makers ensure that the social safety net is sufficient to enable households to meet their basic needs after separation.

To my knowledge, this is the first study of the effects of separation on household living standards that goes beyond the examination of commonly studied income and expenditure measures by including additional measures related to food consumption which, taken together, should provide a more accurate picture of household living standards than income and expenditure measures alone. It is also one of the few studies to examine the medium- and long-term effects of separation using longitudinal data and the only study to do so using consumption data from France. The economic consequences of divorce have been studied many times, showing evidence of a drop in income one year after a divorce ranging from 23% to 40% [Hoffman, 1977, Duncan and Hoffman, 1985b, Bianchi and McArthur, 1991, Holden and Smock, 1991, McLanahan and Sandefur, 1994, Peterson, 1996, Galarneau and Sturrock, 1997, McKeever and Wolfinger, 2001, Avellar and Smock, 2005, Tach and Eads, 2015]. However, most studies estimate short-term consequences by comparing the periods shortly before and after the separation. The long-term consequences are more rarely investigated as the necessary longitudinal data are often unavailable. Many studies are based on dated samples and do not adjust for time-varying covariates [Weiss, 1984, Duncan and Hoffman, 1985a,b, Peterson, 1989, Stirling, 1989]. Among the more recent studies, many also either do not control for time-varying household characteristics or do not account for unobserved heterogeneity [Fisher and Low, 2009, De Vaus et al., 2014, Fisher and Low, 2016, De Vaus et al., 2017].

Most closely related to this study is the work by Page and Stevens [2004], who study the effects of family structure on income and food expenditures in the US by estimating household fixed effect models and controlling for additional time-varying covariates. The present study examines not only the effects of separation on income and food expenditures, as Page and Stevens [2004] have done, but in addition the effects on quantity of food purchased, diet quality, and body weight. Studying the effects of separation on income and expenditure along with additional less commonly considered consumption outcomes provides a more complete picture of the effect of separation on living standards. Income and food expenditure may change, but households may still be able to meet their basic consumption needs, for example by switching to cheaper products. Studying changes in income and expenditure alone may therefore not reveal the extent to which households are affected in their ability to meet their basic food or nutritional needs.

Finally, while most existing studies focus on the USA, this study provides evidence of the effects of separation on living standards in France. From a policy point of view, it is interesting to

know whether the effects identified from US data are also valid for other countries. The effects of separation could differ between France and the US, as social benefits are generally more generous in France than in the US, with public spending on family benefits, including cash outlays, services and tax breaks, representing only around 1% of GDP in the US in 2017, compared with over 3.5% in France [OECD, 2017].

The remainder of the paper is as follows. Section 2 describes the data, section 3 details the method used, section 4 presents and discusses the results and Section 5 concludes.

2 Data

This study examines examines the effects of separation on household living standards by studying the effects on commonly studied income and expenditure measures and by going beyond these commonly studied outcomes through the inclusion of additional measures related to food consumption which are food quantities purchased, diet quality and body weight. A difficulty of studying both financial and additional consumption related outcomes is that the data must contain information on household composition and income, as well as reliable and detailed data on food consumption related outcomes.

I use data on household characteristics and food purchases from a representative sample of French households collected by *Kantar Worldpanel* covering the period 2005 to 2014. *Kantar Worldpanel* is a private company specialized in the construction of consumer panels and analysis for market research purposes similar to Nielsen Holdings in the US. The firm provides households with scanners to record their food purchases of goods with a bar code. Food items without a bar code are entered manually by a household member.[2] Data on individual and household characteristics include information on household composition, household disposable income bins (income including salaries, pensions, alimony payments, etc.), and the socioprofessional category, age, sex, height, weight, education level, and labor market status of each household member. Information on food purchases include product type, quantity, price and exact purchase date.

As the data on individual and household characteristics are updated annually, the time interval for analysis in this study is the year. I construct household food quantities purchases as the sum of the quantity of products purchased annually in kg and household food expenditure as the some of annual food expenditures denominated in euros. I define the share of unhealthy food products purchased as annual purchases in kg of prepared food products (such as pizza, sauerkraut, cassoulet, etc.), salty-fatty products (such as finger food, crisps, crackers, appetizers), and sweet-fatty products (such as candy, chocolate, cookies, pastries, ice-creams, jams, etc.) over the total amount of annual food purchases in kg. I use the information on body weight, height and age to construct the body mass index (BMI) of each household member and household total calorie needs. BMI is defined as body weight divided by the square of the body height. It is a commonly used measured to standardize weight for height and a rule of thumb to broadly categorize a person as underweight, normal weight, overweight, or obese based on tissue mass (muscle, fat, and bone) and height.[3] Total household

[2]For more information, see the *Kantar Worldpanel* website `https://www.kantarworldpanel.com/global/Consumer-Panels`.

[3]Major adult BMI classifications are underweight (BMI under 18.5 kg/m^2), normal weight (18.5 to 24.9), overweight (25 to 29.9), and obese (30 or more). BMIs under 20 and over 25 have been associated with higher all-cause mortality, with the risk increasing with distance from the 20–25 range.

calorie needs is constructed as the sum of each of the household member's basal metabolic rate (BMR). Basal metabolic rate is the amount of energy per unit of time that a person needs to keep the body functioning at rest. Some of those processes are breathing, blood circulation, controlling body temperature, cell growth, brain and nerve function, and contraction of muscles. Basal metabolic rate affects the rate that a person burns calories and ultimately whether that individual maintains, gains, or loses weight. It is influenced by several factors including age, sex, weight and height. BMR may be measured by gas analysis through either direct or indirect calorimetry or is commonly approximated with equations using age, sex, height, and weight. Here, I use the Harris-Benedict equation.[4] The sum of household members' BMRs provides an approximation of total household caloric needs, taking into account differences in household composition in terms of age and gender and weight. I do not have information on the purchase of food consumed outside the home, but households report the number of meals typically eaten at home per day of the week. I use this variable to calculate the average of the number of meals eaten at home per week in a given year to account for changes in eating habits related to food consumed at home.

An advantage of using the *Kantar Worldpanel* data is that I can use it to go beyond previous studies looking at income and food expenditure to investigate in addition the effects of separation on the amount of food quantities purchased, diet quality and household member's body weight. A drawback of using this data is that the data do not include information on the marital status of the household members. Households are classified into young, mid-age and old single or couple households and family households. The status changes from couple to single household when a partner leaves, but family households remain classified as family as long as children are present (single-parent households). To overcome this limitation, I exploit the fact that each individual is assigned a status code that is not reassigned to other household members in case the member leaves the household. Status 1 is always assigned to the female household member who is in charge of the household, as opposed to status 3, which designates another female household member who is a dependent, such as a child. Status 2 is always assigned to a male household member who is assumed to be in charge of the household, as opposed to status 4, which denotes another male person in the household who is again a dependent. I define separation as the departure from the household of an individual with status 1 or 2. I am therefore not distinguishing between the separation of cohabiting or married couples. The departure from the household could also be due to the death of a spouse rather than separation. Few deaths occur before the age of 65 and in most cases family dissolution is due to the separation of the couple [INSEE, 2015, INED, 2018]. To give an order of magnitude, in 6% of single-parent families, the spouse has died. However, I cannot exclude that some of the effects that are picked up with my measure of separation are due to the death of a spouse. I show that the results of the study are robust when I consider a sub-sample of individuals younger than 45 years (see the results and discussion in Section 4.2). Before the age of 45, less than 5% of all family dissolutions are due to the death of a spouse [INSEE, 2015].

I observe a total of 42,000 households for an average duration of 5.9 years whereas the maximum observation window is 10 years. The results presented in this study are from analyses using a sample of treatment households that is unrestricted except for the condition of observing the household at least one year before the separation, the year during the separation and a year

[4]For men: BMR = (13.7516 × weight in kg) + (5.0033 × height in cm) – (6.755 × age in years) + 66.473; for women: BMR = (9.5634 × weight in kg) + (1.8496 × height in cm) – (4.6756 × age in years) + 655.0955. BMR does not include calorie needs due to physical activity. The basal metabolic rate accounts for about 60 to 75% of the daily calorie expenditure by individuals.

thereafter so that any effect of separation could be identified. As it has no consequences on the estimated coefficients, I avoid further restricting the sample of separating households to keep as many observations of separation as possible. The group of control households is restricted to households observed for at least seven consecutive years. This restriction is to avoid the appearance of a pre-trend in food purchases. Compared to the other outcome variables, food purchases vary more strongly between households and over time, so using a panel with households observed for short periods could lead to effects induced by changes in sample composition. Otherwise, the results are qualitatively equivalent whether I do not restrict the sample of the control households. See section 4.2 for further discussion on this point and further sensitivity analyses in relation to different event time windows to rule out that the results are driven by changes in the composition of the sample over time. Table A1 provides summary statistics for the unrestricted sample and the sub-sample restricted to households observed for at least seven consecutive years with observations pooled across households and years. Both samples are similar, except that the amounts of food purchased are larger and the ages of the spouses are higher in the restricted sample. The households that are included in the panel for only a short period of time could be less rigorous in reporting their food purchases. The higher average age could possibly be due to different time constraints between younger and older people, with older people having more time to continue participating in the panel. The final sample is composed of a total of $10,033$ households observed for an average of 8.6 years.

Table A2 shows statistics for France for a comparison with the data used in the study. Average household disposable income in 2010 in France was $2,919$ EUR and is not too far away from the average disposable income of $2,646$ EUR in the data. The level of inactivity of the population is also close to the level in data. The household size of 2.6 in the data is slightly larger than the 2.3 of the general population. The average age of the population, especially the male population, is lower than the sample average. However, the results of the study are robust when I consider a sub-sample of individuals younger than 45 years (see the results and discussion in Section 4.2).

Table A3 compares summary statistics of treatment households in the year before separation to non-single households from the control group. In the separating households, income and food quantities purchased are lower and the spouses are younger than in the control households. For this reason, it is important to use a household fixed effects approach and adjust for time-varying covariates. The results of the study are also qualitatively similar when the control group is fully omitted or chosen in different ways, including a propensity score matching approach (see the results and discussion in Section 4.2). Of the total of $1,038$ households for which I observe a separation, there are 854 cases of a male partner leaving the household (departure of an individual of status 2) and 184 cases of a female partner leaving the household (departure of an individual of status 1). The "remaining" observed household is the household in which the spouse continues to respond to the survey *Kantar Worldpanel*. At the time of separation, 475 of the households are couple-only households, 306 have at least one child under age 18 in the household, and 206 households have at least one child under age 12 in the household.

Table A4 shows the number of households that are observed by year of distance with respect to the year of separation. As not all households are observed during the entire observation window, the composition of the households changes by year of distance from the separation. In the year before, during and after the separation, $1,038$ households are observed, but fewer household observations are available to estimate the effects in earlier and later years. The results are qualitatively similar in regressions where households observed for fewer periods are gradually removed and when using the

estimator proposed by De Chaisemartin and d'Haultfoeuille [2020] that accounts for unbalanced samples (see the results and discussion in Section 4.2 and 4.3).

3 Method

The aim of the study is to investigate whether the separation of a couple affects the households' ability to meet their most basic consumption needs. To this end, I examine the evolution of a range of outcome variables in the years before and after separation, compared to the period immediately before separation and compared to households in which no separation takes place. I implement the following event study design

$$Y_{ht} = \alpha_h + \gamma_t + \sum_{j=\underline{j}}^{\bar{j}} \beta_j D_{ht}^{j} + \rho X_{ht} + \epsilon_{ht},$$

where Y_{ht} denotes the outcome of interest for household h at time t, α_h and γ_t are household and year fixed effects, D_{ht}^{j} denotes the treatment indicator for a separation happening $j \in [\bar{j}, \underline{j}]$ periods away from t, X_{ht} is a vector of time-varying household characteristics and ϵ_{ht} is the error, clustered at the household level. The variables of interest are the event time coefficients β_j, which measure the impact of separation relative to the households that do not separate and, as I omit the event time dummy $j = -1$, relative to the year just before the separation.

For the outcome variables, I consider household disposable income, food expenditure, quantity of food purchased, diet quality in terms of the share of unhealthy food purchases out of total food purchases, and the body weight of household members. Disposable income is a commonly studied outcome in the literature as a classical direct measure of the availability of economic resources. Household expenditure and, more rarely, food expenditure, have been studied as measures preferable to income measures because income underestimates available financial resources and because consumption is a more direct measure of well-being [Meyer and Sullivan, 2004, Page and Stevens, 2004]. The quantity of food purchased, diet quality and the household member's body weight have generally not been a focus in the literature on the effect of separation on living standards. I consider them here as important supplementary measures related to food consumption. Changes in these outcome variables are likely to be more informative about the difficulty households have in meeting their basic food consumption needs than changes in income and even food expenditure would suggest. A fall in income and food expenditures does not necessarily signal a decrease in actual food quantities consumed. Households might be able to shop for bargains and substituting for cheaper products instead of cutting back on quantity of food purchased. Examination of the quantities of food purchased and purchases of unhealthy foods in relation to total food purchases tells us whether such substitutions are taking place. Changes in the body weight of household members are a final reflection of the adequacy of their food consumption. Combining more widely-studied income and expenditure outcomes with other, less well-studied outcomes related to food consumption which are potentially highly revealing of household economic distress should provide more information about household living standards than income and expenditure measures alone.

I do not transform the outcome variables into per capita or per consumption unit terms, but rather include household size in the vector of time-varying household characteristics X_{ht}. Household size captures variation in the outcome variables due to changes in household composition as a result

of the arrival or departure of household members, in both treated and control households. The changes in household outcomes due to couple separation as captured by the event dummies are therefore net of the effect of a change in household size. A departure of another household member than the partner does not affect the outcome variables and the results are also robust to using per capita income and food purchases instead (see Section 4.2 on sensitivity analyses). Thus, the effects captured by the separation event dummies are not simply the mechanical consequence of a household member leaving the household, but they reflect the effects of separation on household-size adjusted outcomes.

Besides household size, the vector of time-varying household characteristics X_{ht} includes dummy variables for the age of both spouses to adjust for underlying life-cycle trends. For the regressions on food purchases and share of unhealthy food product purchases over total food purchases, I additionally adjust for total household calorie needs and the average number of meals eaten at home in a typical week. Total household calorie needs vary over time as a function of the household's composition in terms of sex and age and is a more refined measure of adjustment than simply household size. The average number of meals eaten at home in a typical week is used as an indicator of eating habits in terms of the proportion of food eaten at home compared with that eaten away from home. The estimated changes in food purchases and changes in the share of unhealthy food products are therefore net of potential changes in the proportion of food eaten at home. For the regressions on body weight I adjust also for the average number of meals eaten at home as a changes in the proportion of eating at home or outside the home might also drive changes in weight. In the main regressions I also adjust for changes in the labor market status of both spouses to address concerns of bias due to job loss that could directly impact household economic resources and also affect the decision to break up. The inclusion of the proportion of food eaten at home may be an over-control in the case that habits of eating out are impacted by separation. Similarly, the inclusion of the labor market status of the spouses (for changes in labor market status after the separation) may be also over-controls in the case that labor market changes are also a response to couple separation. I discuss this issue further in Section 4.2 on sensitivity analyses and show that the results are generally not sensitive to including or excluding these covariates.

The model includes household and year fixed effects. The year fixed effects flexibly account for the impact of common macro-level shocks. Including household fixed effects accounts for time-invariant differences between households and exploits the longitudinal aspect of the data by looking at changes in the outcome variables within the households over time. The main results presented in this study stem from regressions that also include households in which no separation is observed as control households. This is a common approach in event study designs and means that both the timing-of-event and a comparison of treated and control units are used as sources of identification [Miller, 2023]. While the variables of interest, the event time dummies, are only identified using within-household variation in households where separation occurs, the year dummies and the time-varying variables are estimated using variation from the control households as well. Ideally, including the control households should allow to estimate how much more economic resources households would have had if the couple had remained together. However, we might worry that the never-treated units could be problematic comparisons for the treated units. The control group may be positively selected with regard to unobservable characteristics and might not provide a good counterfactual for outcome for treated individuals. In sensitivity analyses, I use a propensity matching approach to select and re-weight control households that are more representative - at least in terms of the observed characteristics - of the treated units. I also present estimates that

are based solely on the timing-of-event variation by omitting control households altogether. These approaches produce qualitatively similar results (see Section 4.2 on sensitivity analyses).

I observe treated households up to seven years prior to and eight years after the separation, meaning that the event time runs from at most −7 to +8. However, the panel is unbalanced (see Table A4 for the number of households observed by year of distance to separation), meaning that the event time estimates are not all calculated using the same pool of households. The main results are based on regressions with the largest possible event window to show a long path of treatment effects, and for the pre-event coefficients to give a long window for detecting potentially problematic patterns. Although it is unlikely that households differ systematically by year of separation, it would be ideal if the coefficients for the event time were all estimated based on the same set of units to rule out the possibility that changes over time are due to changes in household composition. In the sensitivity analysis, I therefore run regressions that only include households observed for different minimum periods before and after separation in order to create a balance in event times. The results are robust to alternative choices of event time windows (see Section 4.2 on sensitivity analyses).

Identifying causal effects of couple separation is challenging because a separation is unlikely to be exogenous. First, separating households may be different from those that do not, and second, time-varying shocks that increase the chances of separation may also affect the outcome variables. I account for several sources of bias through the inclusion of household and time fixed effects which addresses the first concern. While I cannot fully exclude that some bias remains due to time-varying shocks, I can rule out the influence of some types of time-varying shocks. The data include information on the labor market status of both spouses, so I can observe and control whether the household suffers an income shock due to becoming unemployed. By following the trajectory of the outcome variables over time, I can also see whether there are any changes in the outcome variables before separation. This makes it possible to rule out the possibility that the results are due to unobserved shocks that have an immediate impact on some of the outcome variables while leading to separation with a certain time lag. If, for example, a health shock first leads to a fall in household income and then, with some delay, to separation, I should observe an effect on the outcome variables before separation. With the exception of a slight increase in the share of unhealthy food purchases in total food purchases prior to separation, I observe no change in household income, food purchases or body weight in the years leading up to separation. However, I cannot rule out the possibility that the estimates may still suffer from some bias in the event that unobserved time-varying shocks have a significant and immediate direct effect on the outcome variables and also immediately lead to the spouse leaving the household.

In order to identify the most vulnerable households and to study potential adaptation mechanisms, I carry out analyses of the heterogeneity of effects according to household and individual characteristics. For this, I run separate regressions grouping households by pre-separation income, household composition (presence of children), and the employment status, subsequent relationship status and sex of the spouse who remains observed in the household. Households are likely to use their savings or reallocate their budget by diminishing other leisure and durable goods expenses to maintain some minimum level of food consumption. If saving and budget reallocation are essential mechanisms, I expect food consumption, diet quality, and changes in body weight to be most responsive in low-income households, which may be less able to accumulate savings and smooth over the income shock. An employed spouse may be better able to maintain his or her previous standard of living, while the presence of children in the household may impact the ability of the spouse to adjust to the income shock. I also investigate whether previously unemployed spouses

take up an employment or move together with a new partner and if this mitigates the effects of separation.

Treatment effects might not only differ along the lines of the observable characteristics, but they might differ across households in unknown ways. Recent literature on the performance of event studies in the presence of heterogeneous treatment effects has shown that if treatment effects differ between units, then the main estimates are a weighted average of the underlying treatment effects. In general, the weights may not be consistent with common sense intuitions or desired weighting, including the possibility of negative weights that could lead to highly biased estimates of the average treatment effect, up to the point where the estimated average treatment effect could have the opposite sign to the underlying treatment effects [Sun and Abraham, 2021, De Chaisemartin and d'Haultfoeuille, 2020]. I follow the approach proposed by De Chaisemartin and d'Haultfoeuille [2020] relying on using not-yet-treated units and the parallel trends assumption to recover estimates of the treatment effects for each treated unit type, which can then be averaged together. This approach produces very similar estimates to the main analysis, especially for the regressions that include the control households. When control households are included, virtually none of the weights attributed to the underlying treatment effects are negative and most of the weights are very small (see Section 4.2 on sensitivity analyses). This is to be expected as the problem of negative weights results from comparing newly treated units with already treated units, which is not the comparison that drives the results in the regressions that include the control households.

4 Results

Section 4.1 presents and discusses the main findings on the impact of separation on household income, food purchases, diet quality and body weight of household members. Section 4.2 reports the results of sensitivity analyses, including alternative model specifications using different transformations of the outcome variables, different sets of covariates, different choices of event windows, different choices of households included in the control group, and placebo exercises, including estimates of the effect of a household member other than the spouse leaving the household and regressions using a fake time of separation. Section 4.3 presents analyses of heterogeneity in the treatment effect and discusses the results with respect to possible mechanisms of adjustment to or coping with separation and differences in vulnerability between households.

4.1 Impact of separation on household income, food purchases, diet quality and spouse's body weight

Key results. Figure 1 shows the point estimates on the time-event dummies and 95% confidence intervals based on standard errors clustered at the household level from regressions using the preferred model specification. These regressions all include household and year fixed effects, household composition, and spouses' age and employment status. The regression on food quantities purchased further include total household calorie needs and the average number of meals eaten at home in a typical week. The outcome variables are the logarithm of household disposable income, logarithm of food quantities purchased, logarithm of the spouse's BMI and the share of unhealthy food purchased over total food purchases. All households in which no separation is observed are included in the control group. The event-time dummy for the year before the separation ($j = -1$)

is set to zero. Figure 1 therefore shows how household income, food purchases, diet quality and the spouse's body weight evolve relative to the year before the separation ($j = -1$) and relative to households where no separation occurs. Table A5 in the Appendix presents the corresponding regression tables.

Several key findings emerge from the Figure 1. First, the results suggest that separation leads to significant and permanent losses of economic resources after separation. Panel A shows that there is no difference in the evolution of (household-size-adjusted) disposable income between households that break up relative to the control households in the years before separation. Disposable income then suddenly declines in the first year after the separation ($j = 1$) by 20% compared to pre-separation levels and then remains 25% lower from the second year after the separation until the end of the observation window. Second, households seem to cut back on food quantities purchased after separation. Panel B shows that in the years before separation, food purchases are similar across treatment and control households and relative to the year just before the separation. Food quantities purchased suddenly decline in the first year after the separation by 20% and then remain between 25% to 30% lower up to six years later, then slightly recover until the end of the observation window. Food expenditures evolve in exactly the same manner, which is why the results are not shown here. Third, the declines in household income and food consumption are accompanied by a 1.5% decline in the body mass index (BMI[5]) during the first three years after the separation. Panel C shows that the remaining spouse's BMI is visibly lower during the first, second and third year after the separation before reverting to pre-separation levels and becoming indistinguishable from the levels in the control group in the fourth year after the separation. This weight loss occurs despite an increase in the share of unhealthy food purchases consisting of more salty, sweet, fatty and convenience foods, which are calorie-dense food products. Panel D shows that the share of unhealthy food purchases over total food purchases gradually increases in the households that separate during the years prior to separation relative to the control households and with respect to the period just before separation. The share then increases to surpass the share of unhealthy food products bought in the control group in the first and second years after the separation. The difference is not statistically significant in the subsequent years.

Robustness to different specifications. Note that these effects on income and food purchases are not simply a mechanical consequence of the departure of a household member, but they reflect the effects of separation on household-size adjusted outcomes. As all regressions include household size in the vector of time-varying household characteristics, the changes in household outcomes as captured by the event dummies are therefore net of the effect of a change in household size. In Section 4.2, where I present sensitivity analyses, I show that the departure of a household member other than a partner does not have a negative impact on household income and food purchases, and that using per capita income and food purchases rather than including household size in the vector of covariates also yields qualitatively similar results. Section 4.2 also shows that the results are robust to alternative model specifications using different sets of covariates, different choices of event windows, and different choices of households included in the control group. The effects are also not sensitive to using estimates proposed in the recent literature on two-way-fixed effect event studies approaches that are robust to bias from unobserved treatment effect heterogeneity (see

[5]BMI is defined as body weight divided by the square of the body height. It is a commonly used measured to standardize weight for height and a rule of thumb to broadly categorize a person as underweight, normal weight, overweight, or obese based on tissue mass (muscle, fat, and bone) and height. The results are qualitatively the same when using body weight directly.

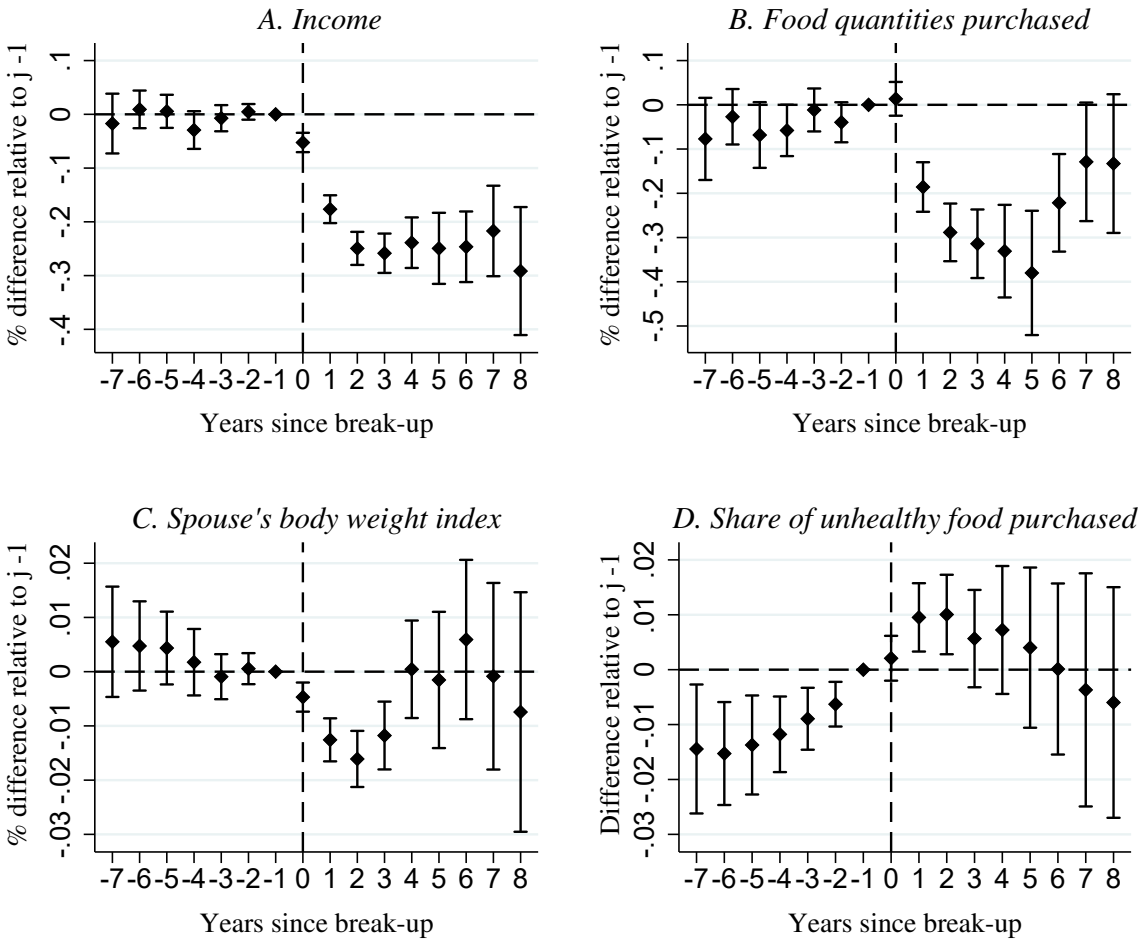

Figure 1: Trend in outcome variables around separation.
Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The dependent variable are the income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), the share of unhealthy food products purchased, per capita income and per capita food quantities purchased in household i in year j. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

Section 4.3).

Causal interpretation of the results. The results suggest that couple separation in France has long-lasting adverse effects on household income and that households cut back their food consumption to the point that spouses measurably lose weight. An important question is to which extent these results can be interpreted as causal effects of separation. Separation is unlikely to be exogenous because separating households may be different from households that do not separate. I address this issue by including household fixed effects, which take into account all differences between households that are invariant over time. I also show that the results are robust to using different subsets of control households or dropping the control households altogether.

Another major concern regarding the causal interpretation of the results is the existence of time-varying shocks, such as sudden unemployment or an adverse health shock, that might increase the chances of separation and also have a direct effect on the outcome variables. Changes in the households outcomes that are caused by the unobserved shock could then wrongly be attributed to the separation. I do my best to rule out the influence of most - if not all - types of time-varying shocks. By following the trajectory of the outcome variables over time, I can determine whether there are changes in the outcome variables before separation. If there are unobserved shocks that have an immediate impact on the outcome variables but lead to separation with some time lag, then I should observe changes in the outcome variables before the separation occurs. For household income, food purchases and spouse body weight, I find no evidence of anticipatory effects. These outcomes remain stable in the years before separation and then fall sharply at the time of separation. I see an increase in the proportion of unhealthy food purchases in the years before separation, which possibly indicates that households are experiencing a stressful situation. However, this may be interpreted as an effect of the separation itself, if rising intra-household tension and conflicts is considered part of the separation.

What is more difficult to exclude, however, is that there may be some remaining bias due to unobserved time-varying shocks that lead to the dissolution of the joint household within the space of a year while affecting household income in that same year (so that separation happens in the exact year when the effect on household outcomes are first observed). Fortunately, the data includes information on the labor market situation of both spouses. I can therefore observe and control whether the household suffers an income shock as a result of becoming unemployed. This method also controls for income losses due to unemployment after a health shock, but it does not take into account the possibility that a health shock could lead to changes in food consumption and body weight independently of income loss and separation, perhaps by affecting appetite, which could bias estimates of the effects on food purchases and body weight. However, it seems unlikely that health shocks are frequent enough, that they lead to separation often enough and that they simultaneously affect appetite permanently and strongly enough to explain the observed 20-25% drop in food purchases. There might exist other shocks that simultaneously lead to separation and effect the outcomes, although I cannot think of any.

Policy relevance of the findings. Another important question is to which extent the results are relevant from a policy perspective. One possible interpretation of the results is that households experience a decline in living standards after separation reaching a point where they cannot maintain a minimum level of consumption to meet their dietary needs, despite the existing public and private transfers. In this case, additional policy intervention could be justified on ethical grounds and to avoid the societal costs that could potentially arise from the negative effects associated with the inability to meet basic needs of nutrition. It may be argued that the weight loss could potentially

have some health benefits. However, an involuntary weight loss accompanied by a deterioration in diet quality is not healthy and not something we should applaud. It would be cynical to argue that a decrease in household purchasing power is positive because it could lead to health benefits from reduced calorie intake. The decline in living standards after a divorce, to the point that households need to cut back their food consumption, might discourage some spouses from separating, even though they would have liked to do so. Separation in itself is not a negative event and would not be the choice of many spouses if it was not welfare improving. Separation might be good for the sake of mental health, sometimes also physical health.The policy intervention I advocate is therefore not one to encourage people to stay together, but rather to make sure that the welfare safety net is adequate to allow people to divorce without fear that they will struggle to fulfill basic needs such as adequate nutrition.

A possible alternative explanation for the findings is that people have a preference for losing weight after separation, possibly to increase the chances of finding a new partner. In this case, the observed decline in food purchases and weight might be a conscious choice rather than imposed by financial constraints. The underlying reason could be to find companionship, which would not warrant policy intervention. However, it is also possible that people feel pressure to find a new partner as a means to improve their financial situation. It has been shown that households recover their pre-separation standard of living only after finding a new partner (see for example [Page and Stevens, 2004]). I show evidence for this as well in Section 4.3. In this Section I further show that the reduction in food purchases and weight loss is stronger in households with low pre-separation household income, in female-headed and single-parent households which could be interpreted as evidence in support of this argument. Spouses in the more severely affected households could feel compelled to lose weight to increase their chances on the dating market because they see a new encounter as a way out of a dire financial situation whereas spouses from households with high pre-separation might feel less pressure because their living standard after separation is relatively higher and sufficient to cover basic needs. In such a case, the policy ramifications might be less dramatic, as households are not prevented from meeting their basic food needs due to financial constraints. However, we might be concerned that a subset of the most vulnerable will be pressured to find a partner in order to regain their pre-separation standard of living. We may want to avoid situations of dependency that lead people to get into and stay in relationships that are potentially unhealthy and that they would not enter into without financial pressure. Finally, separation possibly leads to depression and loss of appetite, which could also explain the decrease in food consumption and weight loss. Then again, the stronger effects in households with low pre-separation household income suggest that if depression mediates the effects of separation, the occurrence or severity of depression itself might be at least partly related back to the financial situation of the household.

Comparison with results from the literature. Declines in household income and food purchases at the time of separation have previously been reported in the literature. In a study that is the most closely related to the present study, Page and Stevens [2004] look at the time path of income and food purchases using household fixed effects but using data from the US report a 50% decline in disposable income and 35% reduction in food expenditures. These effects are stronger than the 25% in disposable income and similar to the 30% to almost 40% declines in food expenditures or quantities purchased I find for France. The different effect on disposable income could be due to the more generous welfare systems in France compared to the US. Public spending on family benefits including spending in cash, services and tax breaks in 2017 amounts to over 3.5% of GDP in France whereas it is only about 1% in the US [OECD, 2017]. Another possibility is that the

differences are due to the different time periods considered. Page and Stevens [2004] use data from the 1968 through 1993 waves of the Panel Study of Income Dynamics whereas I use data on households from 2005 to 2014. The effects of separation in France appear to last longer compared to households in the US. I mostly do not find evidence for recovery over time, whereas Page and Stevens [2004] find that food purchases recover partially after 6 years as they are then only 6% lower than pre-separation level and household income is 23% lower than pre-separation levels. The authors attribute this recovery mainly to re-marriage. I only rarely observe a new spouse joining the household, which may explain why I do not observe a recovery at the aggregate level. For the households where the spouse enters a new relationship, I also find that income and food expenditure reverts to pre-separation levels (see Section 4.3). Finding a decrease in the body weight of the remaining spouse is consistent with some previous studies [Lee et al., 2004, Eng et al., 2005], but the results from the literature are ambiguous as other studies point rather to a weight gain [Mata et al., 2018]. Regarding the share of unhealthy food products purchased, I did not find comparable estimates in the literature. A few studies examine the associations between marital status change and dietary behaviors by focusing mainly on a limited set of food items [Lee et al., 2004, Vinther et al., 2016].

4.2 Sensitivity analyses

The results are robust to alternative model specifications using different transformations of the outcome variables, different sets of covariates, a different selection of event windows and a different selection of households included in the control group. Placebo exercises, including estimating the effect of a household member other than the spouse leaving the household and regressions using a fake time of separation yield no results.

Robustness to using different transformations of the outcome variables. Panels A to C in Figure A1 in the Appendix show that the results are qualitatively similar when using the original non- transformed dependent variables rather than their log transformation. Panels D and E show that the results are qualitatively equivalent when using per capita income and per capita food purchases instead of using the level and log-transformation of these outcome variables and controlling for household size in the vector of time-varying covariates. Table A6 in the Appendix presents the corresponding regression output. Together with the fact that I don't find results when I consider another household member than the spouse leaving the household (see the placebo exercise below), this is evidence that the results in this study are not a simple mechanical consequence of a household member leaving the household but that these effects are net of the effects of a change in household size.

Robustness to including different sets of covariates. Besides household and year fixed effects and household size, the main regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on body weight I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs (see Table A5 presenting the main regression results). A concern might be that the inclusion of some of these covariates are bad controls. Changes in the number of meals eaten at home (as opposed to meals eaten away from home) and changes in the labor market status of the spouses after separation could be a response to separation and should therefore not be included in the regressions. In fact, I find that the average number of meals eaten at home increases after

separation and that spouses become active in the labor market after separation. See Table A7 in the Appendix. However, I find that the results insensitive to changing the set of covariates included. Table A8 to Table A11 in the Appendix show results for regressions including different sets of covariates. The coefficients are similar and the differences are not statistically significant. The effects of separation on meals eaten at home and the labor market status of the spouse are likely too small to drive the effects of separation on the outcome variables. Figure A2 in the Appendix shows that the evolution of the outcome variables for regressions including only household and year fixed effects and household size. The results are virtually the same as the results from the main regressions.

Robustness to a different choice of event window. I observe treated households up to seven years before to and eight years after the separation. However, the panel is unbalanced (see Table A4 for the number of households observed by year of distance to separation). The event-time coefficients for -1, 0 and 1 are based off of all separations but the other event-time estimates are based off of fewer households, meaning that the event time estimates are not all calculated using the same pool of households. The main results are based on regressions with the largest possible event window to show a long path of treatment effects, and for the pre-event coefficients to give a long window for detecting potentially problematic patterns. To alleviate concerns that changes over time are due to changes in household composition in the treatment sample, I run regressions that only include households observed for different minimum periods before and after separation in order to create a balance in event times. Figure A3 in the Appendix presents results for regressions where I exclude treated households that are observed less than two periods before and less than four periods after the separation. The event-time coefficients -2 to 4 are estimated off of the same 154 households, whereas the event-time coefficients -5, -4 and -3 are based on variation from 25, 30 and 60 households and the event-time coefficients 5, 6 and 7 are based on 57, 44 and 21 households. Focusing on the event-time coefficients -2 to 4 as they are calculated using the same households, we see that income declines by around 15-22%, food purchases drop by around 15-28%, the BMI of the spouse decreases slightly but statistically significantly during the first three periods after separation and reverts by event-time 4 and the share of unhealthy food purchases increases slightly around the time of separation. As the number of treated households has been reduced, the estimates are more noisily estimated, but the results are qualitatively similar to the results form the main regressions. This is evidence that the results are not driven by changes in the composition of the households over time.

Robustness to different choices of households included in the control group. The main results are based on regressions that include households in which no separation is observed as control households, meaning that both the timing-of-event and a comparison of treated and control units are used as sources of identification. However, we might worry that the never-treated units could be problematic comparisons for the treated units. To address this concern, Figure A4 in the Appendix shows results for regressions including only the households where a separation is observed. Without the inclusion of control households, the results from these regressions are based only on the timing-of-event as a source of identification. The results are qualitatively very similar to the results from the regressions with control households. Income declines by around 20% compared to 25% in the regressions include control households, food quantities purchased decline by more than 40% compared to 30% in regression including control households, but without being statistically significantly different. The results for BMI are the same for regressions with and without control households. The results for the share of unhealthy food products disappear in

the regression excluding the control households. Interestingly, the upward trend before separation disappears. Possibly the control households are not ideal comparisons when it comes to the evolution of the share of unhealthy food products purchased. However, the differences in the coefficients are again not statistically significant. Overall, the estimates relying solely on the timing-based subset of the data are similar to the estimates relying on variation from both the timing-of-event and a comparison of treated and control units, which should alleviate concerns that the control households are problematic comparisons. The results are also robust to using a propensity score matching approach to eliminate control households that could be too different from the treated households. When keeping only $4,623$ untreated households with the highest propensity score out of the out of $27,774$ untreated households, the results are unchanged (results shown in Figure A5 in the Appendix).

Since the panel is unbalanced not only for the treated households but also for the control households, one might in addition be concerned that using a panel with many control households observed for only a short period of time might influence the treatment effects due to changes in sample composition. The main results are based on regressions where the sample of control households is restricted to households observed for at least seven consecutive years. When I do not restrict the sample of the control households, the results remain qualitatively similar with the exception of the appearance of a upward trend in food purchases before separation (see Figure A6 in the Appendix). Compared to the other outcome variables, food purchases vary more strongly between households and over time, so using a panel with households observed for short periods could lead to effects induced by changes in sample composition.

Robustness to excluding treated households where one of the partners is older than 45 years at the time of separation. As mentioned in the data description, I use the departure from the household as definition for separation and I cannot see whether this departure is due to the death of the spouse. Before the age of 45, less than 5% of all family dissolutions are due to the death of a spouse [INSEE, 2015]. Figure A7 in the Appendix shows results for regressions excluding treated households where one of the partners is older than 45 years at the time of separation. While the results are more noisily estimated as the pool of treated households is reduced to 680, the results remain qualitatively similar to the results include households of all ages, with the exception of the share of unhealthy food purchases. This alleviates concerns that the results might be driven by the death of a spouse and not couple separation.

Placebo exercise: effect of a household member other than the spouse leaving the household. Figure A9 in the Appendix shows results for cases where people other than the spouse leave the household. The results are in no way similar to the results I find for separation. When another household member leaves the household, (household-size adjusted) income increases slightly (between 3% and 5%), (household-size adjusted) food purchases increase in the first year after a non-spouse leaves the household and then mostly revert to zero afterwards, the BMI of the spouse is unaffected, and the share of unhealthy food purchased has a tendency to decrease over time. Without wanting to interpret these results too much, as they are not the subject of this study, the pattern could be consistent with the story of an adult child or elderly parent leaving the household who does not earn an income and therefore does not make the household worse off in terms of income. Food purchases could be higher shortly after the person moves out because households need some time to adjust their purchasing habits to the new household composition.

Placebo exercise: Using a fake time of separation. To test whether similar patterns could have been obtained by pure chance, I conduct two kinds of placebo exercises. First, I reshuffle

the existing separation dates in the households where I observe a separation. I reassign the dates randomly and run the estimation 100 times. Second, I exclude the households where the couple separates, and draw a random subset from the remaining households, to which I then assign random separation dates. I repeat the drawing, date assignment and estimation 100 times. Figure A8 in the Appendix represent the mean and the 95th percentile of the coefficient distributions of these placebo exercises. There is no noticeable sudden drop in any of the outcome variables in any period. At most, the random separation dates seem to capture a slight upward trend in income and food purchases over time in the case where I randomly reassign the dates in the treated households. Assigning random separation dates among the control households leads to coefficients that are centered around zero. These placebo exercises alleviate the concern that the results are obtained by chance, as my actual coefficient estimates are above the 95th percentile of the placebo coefficient distribution.

4.3 Analyses of treatment effect heterogeneity

This section presents the results of analyses of treatment effect heterogeneity and discusses the findings in light of possible mechanisms of household adjustment to separation and differences in vulnerability between households. Households are likely to use their savings or reallocate their budgets by reducing other spending on leisure and durable goods in order to maintain some minimum level of necessary food consumption. If savings and budget reallocation are essential mechanisms, I expect food consumption, diet quality and body weight changes to respond most strongly in low-income households, which are less able to build savings and smooth out the income shock. A working spouse may be better able to maintain their previous standard of living, while the presence of children in the household may affect the spouse's ability to adjust to the income shock through their participation in the labor market. I run separate regressions grouping households by pre-separation household income, household composition in terms of the presence of children, and the employment status, subsequent relationship status, and sex of the spouse who has been left (the spouse who continues to be observed in the household).

Heterogeneity of treatment effects by pre-separation household income.

Figure 2 presents the results of regressions run separately for households grouped according to their average per capita disposable household income in the period before separation. The left-hand panels show results for the 35% of households with the lowest pre-separation average incomes, while the right-hand panels show results for the 35% of households with the highest pre-separation average incomes. Panel A shows a sustained fall in income after separation for both groups of households but larger effects for high-income households, with falls of up to 30%, compared with falls of around 10% to 20% for low-income households. Panel B shows that the amount of food purchased in the low-income households drops by 20% in the first year after the separation and then further to 40% compared to the year before separation before recovering slightly in year five, but remaining around 20% lower compared to pre-separation levels. Food quantities purchased decreases more steadily in the high-income households with a decline of 10% to 20% in the first two years, staying around 30% lower in years three and four to reach a decline of around 40% by year five. Panel C shows that the effects on the remaining spouse's body mass index are stronger in the low-income households. Panel D shows an upward trend in the share of unhealthy food purchases for both groups of households prior to the separation. This trend disappears in the low-income households after separation but continues in the high-income households, reaching a

peak in event-time 5 of around 3% higher share of unhealthy foods purchased compared to the year just before separation.

Overall, the impact of separation on income is more pronounced in the households with the highest pre-separation income, while the impact on food quantities purchased is more immediate and the effect on body weight is more pronounced in the low-income households. However, only the differences in the effects on household income are statistically significant. When a post-separation dummy is used instead of the time-event dummy to increase the precision of the effect estimate, the differences in food quantities purchased are also statistically significant.

The finding of more pronounced income declines for households with higher pre-separation income levels is in line with findings in the literature. For example, Fisher and Low [2016] find that women in the highest income households experience the largest and most persistent falls in their standard of living compared to those in the lowest income households. These high-income households may therefore appear more vulnerable than low-income households, an interpretation adopted by Fisher and Low [2016]. The sharper fall in income in high-income households is perhaps not surprising, as it probably reflects the high wages of the spouse leaving the household. However, this does not necessarily indicate that these households are the most severely affected. Food purchases and body weight fall more in low-income households than in high-income households, suggesting that low-income households are less able to smooth their necessary consumption and are in fact the most vulnerable. This pattern could be due to a lower saving capacity of low-income households, whereas high-income households could have more easily accumulated assets and cushioned the effects better. The results highlight the importance of studying not only household income, but also consumption-related measures that may more accurately reflect changes in living standards in order to identify the most vulnerable population.

Heterogeneity of treatment effects in relation to the presence or absence of children. Figure 3 presents the results separately for couple-only households on left-hand panels and for households where children are present at the time of separation (family households, defined as having family members below age 18) on the right-hand panels. Income declines by around 20% in the couple-only households, while it drops by 35% in the family households. Food purchases drop relatively more abruptly and up to 40% in family households compared to a decrease of about 30% in the couple-only households. The body weight of the remaining spouse decreases statistically significantly in both couple-only and family households, but the magnitude of the effects is more than twice as large in the family households. Overall, the changes in the outcome variable tend to be larger in households with children, but the differences are only statistically significant for income.

Households with children are more likely to be among the 35% of households with the lowest pre-separation incomes than couple-only households. Looking at the heterogeneity of impacts by family type within pre-separation income groups, I find that impacts are still generally more pronounced in households with children compared to couple-only households, even though the estimates lack precision and the differences are not statistically significantly different. See Figure A10 in the Appendix.

Differences in the effect for food purchases could potentially be explained by the fact that children might be registered in the household, even if they are not present at all times. Among children in France whose parents divorced or broke up their civil union in 2009, 76% were looked after mainly by their mother and 9% mainly by their father. Alternating residence, where children spend half their time with each parent, concerns 15% of children. Even when children are mainly looked after by one of their parents, the other parent generally has visiting rights and can receive the

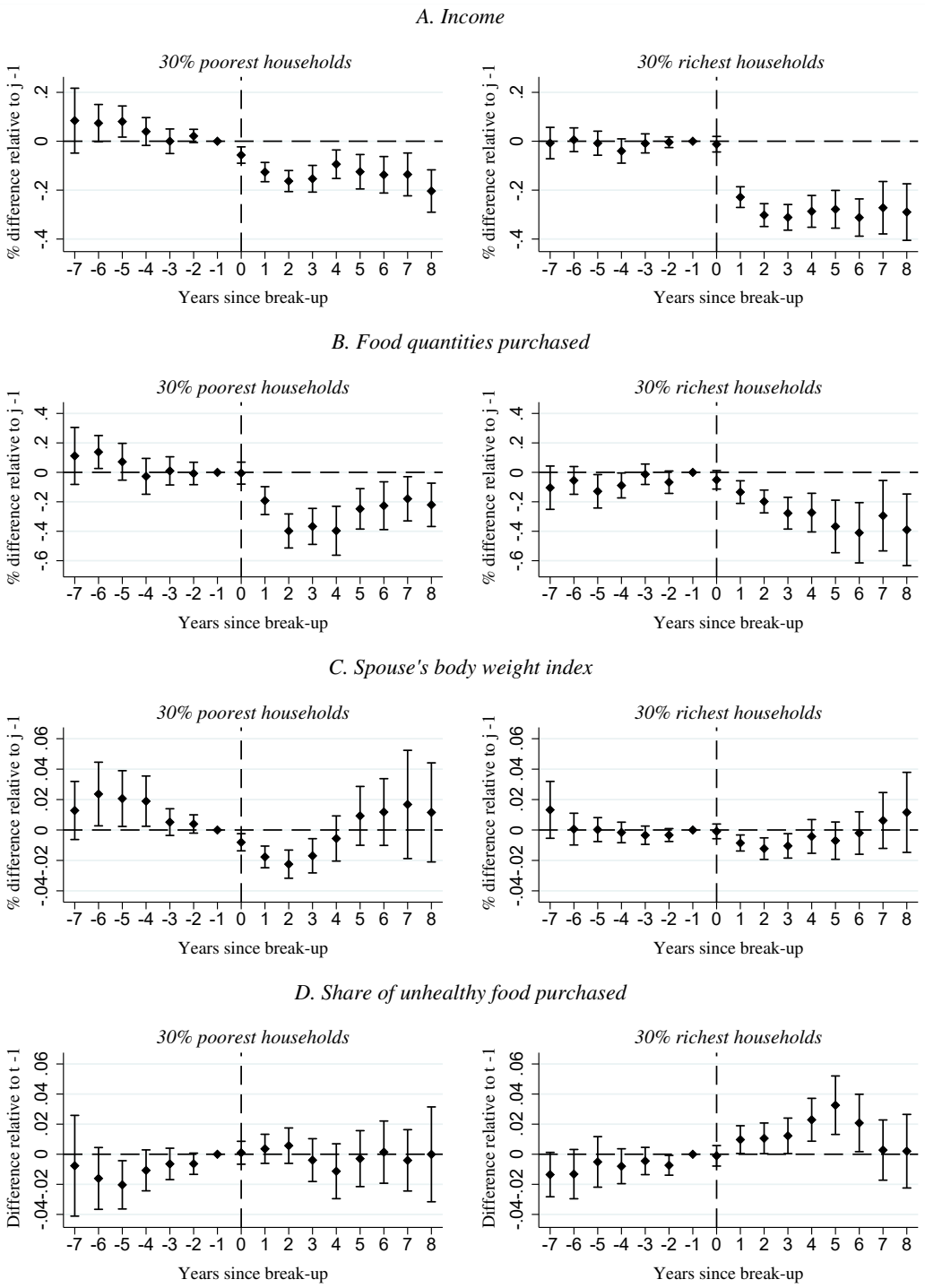

Figure 2: Trend in outcome variables around separation, by pre-separation per-capita income.
Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The left-hand panels present results for the 35% of households with the lowest pre-separation per-capita incomes, while the right-hand panels show results for the 35% of households with the highest incomes. The dependent variable are the logarithm of income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), and the share of unhealthy food products purchased in household i in year j. The controls include household and year fixed effects, spouse's age and labor market status and household size (to adjust for changes in household size besides separation). The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

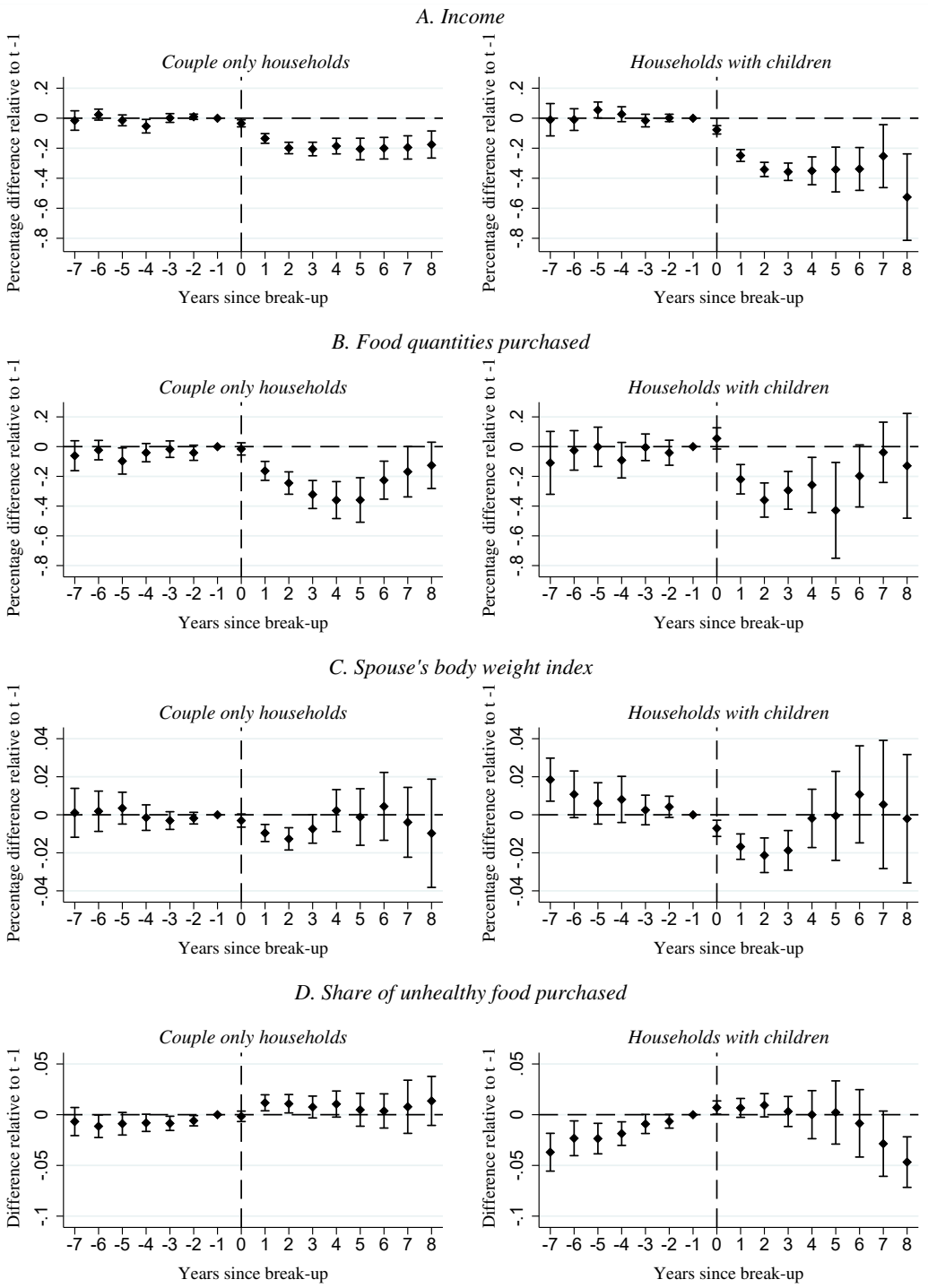

Figure 3: Trend in outcome variables around separation, by pre-separation per-capita income.
Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The left-hand panels present results for couple-only households, while the right-hand panels show results for households with children ("family households"). The dependent variable are the logarithm of income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), and the share of unhealthy food products purchased in household i in year j. The controls include household and year fixed effects, spouse's age and labor market status and household size (to adjust for changes in household size besides separation). The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

child at home every other weekend [Bonnet et al., 2015]. The regressions on food purchases include a control for the average number of meals eaten in the household in a typical week, which should reflect changes in the need for food consumption at home in cases where children eat regularly at their other parent's home after the separation. However, I cannot rule out the possibility that this is a poor approximation and that some results may be affected by changes in the food eaten by children outside the home. The greater effect on the body weight of the spouse in households with children rather suggests an overall reduction in calorie intake, which would be consistent with a reduction in food purchases over and above reductions in household consumption needs.

Overall, the results suggest that single-parent households may be particularly vulnerable after separation.

Heterogeneity of treatment effects by employment status. Figure A11 in the Appendix shows the effects of separation by employment status of the spouse who remains observed in the household after the separation. The left-hand column of figures shows the results for cases where the spouse is active and remains so throughout the observation period, the middle column of figures shows the results for cases where the spouse is inactive and remains so throughout the observation period and the right-hand column of figures shows the results for cases where the spouse is inactive before the separation and takes a job after the separation.

There are some differences in the effects such as slightly stronger declines in food purchases in households with a consistently inactive spouse but stronger decline in BMI in households where the spouse is consistently active. Overall, however, labor market participation does not seem to enable spouses to avoid the effects of separation. This also seems to be the case in households where the spouse becomes active in the labor market after separation. Income seems to decrease, as do food purchases and BMI, although the latter two effects are estimated less precisely due to a smaller number of observations and are often not statistically significantly different from zero.

Heterogeneity of treatment effects by sex. Figure A12 in the Appendix shows results for regressions run separately by sex of the partner who remains observed in the household after separation. For the 184 instances where the remaining spouse is male (when the spouse who left the household is female) I find that income falls by around 10% and the quantities of food purchased by around 18%. The share of unhealthy food products purchased exhibits a tendency to increase, starting in the period before the separation. Although there are clearly effects on income and quantities of food purchased, many estimates are only at the limit of statistical difference from zero as the number of treated observations is relatively low. The effects on a remaining male spouse are much less pronounced than the effects I find by concentrating the analysis on households where the remaining spouse is a woman (the male partner has left the household). Income and food purchases fall by around 30% and 35% and BMI by around 1.5% in the first three years after separation. The share of unhealthy food purchased evolves in a similar way than in households where the female spouse leaves.

While the main results of this study mainly reflect the effects of separation on the standard of living of women and children, given that I mainly observe female-headed households after separation, the results suggest that there are negative, albeit less severe, effects on the standard of living of men as well. This is consistent with the literature, where a large body of research has shown that women experience significant effects [Hoffman, 1977, Duncan and Hoffman, 1985b, Bianchi and McArthur, 1991, Holden and Smock, 1991, McLanahan and Sandefur, 1994, Peterson, 1996, Galarneau and Sturrock, 1997, McKeever and Wolfinger, 2001, Avellar and Smock, 2005, Tach and Eads, 2015], whereas the effects for men have proved to be more heterogeneous and less

severe overall [Smock, 1994, Galarneau and Sturrock, 1997, McManus and DiPrete, 2001].

Heterogeneity of treatment effects by subsequent relationship status. To study the impact of forming a new couple after separation, I estimate the effects separately for households where a new partner joins the household and for households where the spouse remains single after the separation. Figure A13 in the Appendix shows that the effects are less pronounced and shorter-lived in households that form a new couple. In these households, income falls by 20% in the first and second years after separation, then returns to the pre-separation level, whereas the fall in income is permanent in households where the partner does not form a new couple. Food purchases appear to fall in households where the partner is re-establishing a relationship, but the effects are imprecisely estimated. On the other hand, food purchases decrease and remain around 25% below pre-separation levels in households where the spouse remains single. In both types of household, the spouse's body weight falls in the first three years after separation. In households where the spouse re-enters into a relationship, the BMI does not appear to return to its pre-separation level until six years after separation, but the effects are estimated imprecisely.

Unlike participation in the labor market, which does not seem to allow spouses to mitigate the negative effects of separation, forming a new couple seems to be a way of avoiding a long-term reduction in living standards after separation. The finding that forming a new couple reduces the impact of separation is consistent with previous results, such as those of Page and Stevens [2004] who find that marriage mitigates the effects on income and food purchases six years after separation.

Possible effect of treatment heterogeneity of unobserved kind. Treatment effects might not only differ along the lines of the observable characteristics, but they might differ across households in unknown ways. If treatment effects differ between units, then the main estimates are a weighted average of the underlying treatment effects. These weights may not be consistent with common sense intuitions or desired weighting, including the possibility of negative weights that could lead to highly biased estimates of the average treatment effect [Sun and Abraham, 2021, De Chaisemartin and d'Haultfoeuille, 2020]. To address this concern, I implement the approach proposed by De Chaisemartin and d'Haultfoeuille [2020] relying on using not-yet-treated units and the parallel trends assumption to recover estimates of the treatment effects for each treated unit type, which can then be averaged together. This approach produces results that are qualitatively identical to those of the main analysis, as shown in Figure A14 in the Appendix.

Summary of the results from the heterogeneity analysis, interpretation and policy relevance. The results of the analyses on the heterogeneity of the effects show that the effects of separation are more pronounced in low-income households and in households that are single-parent and headed by women after separation. Labor market participation does not enable spouses to avoid the impact of separation, but at best mitigates it somewhat, although the differences in the effects between households with active and inactive spouses are not statistically significant. In contrast to labor market participation, forming a new couple seems to allow avoiding a long-term reduction in living standards after separation.

Stronger effects in low-income households could be interpreted as evidence that the decline in food purchases and body weight is due to or indicative of a decline in household living standards rather than changes in household preferences. The standard of living of the most vulnerable households appears to fall to the point of reducing necessary food consumption, which has a measurable impact on the spouse's body weight. Policy intervention could be justified on ethical grounds and to avoid the societal costs that could potentially arise from the negative effects associated with the inability to meet basic needs of nutrition.

It is of course possible that there are systematic differences in weight loss preferences after separation between income groups, family types and sex, which could explain the different declines in food purchases and body weight. The question is whether this is due to intrinsic differences in preferences for companionship or whether these differences are still ultimately driven by financial constraints. Women, spouses in low-income households and single parents might feel more pressure to lose weight to increase their chances in the dating market because they see a new encounter as a way out of a difficult financial situation, while men, spouses from high-income households before separation and households without children might feel less pressure because their standard of living after separation might be sufficiently high to cover basic needs. If this is indeed the case, we might be concerned that a subgroup of the most vulnerable people are coming under pressure to find a partner in order to regain their pre-separation standard of living. Some households may in fact feel that they have limited options, given the findings of this study that labor market participation does not significantly mitigate the impact of separation, while finding a new partner does. The anticipation of a sharp decline in living standards might also discourage some spouses from separating, even if they would have liked to do so. To avoid situations of dependency that lead people to enter into and remain in potentially unhealthy relationships that they would not enter into without financial pressure, I recommend policy interventions to ensure that the social safety net is sufficient to allow households to meet their basic needs, such as adequate food consumption.

5 Conclusion

This study provides evidence for significant and long-lasting reductions in the living standards of French households after separation. In an event study approach, I examine the evolution of household-size adjusted disposable income, food expenditures and quantities purchased, diet quality and household members' body weight several years before and after separation. I estimate how the outcome variables evolve relative to the year before the separation and relative to households where no separation is observed, adjusting for household and year fixed effects and time-varying household characteristics.

I find sudden and significant declines in household-size adjusted disposable income, food expenditures and food quantities purchased at the time of separation. These effects are detectable until the end of the observation window up to eight years after the separation. The fall in income and food purchases are accompanied by a decrease in the body weight of the spouse who remains observed in the household during the first three years after separation. This weight loss is consistent with a reduction in overall caloric intake from the decline in food quantities purchased and occurs despite an increase in the share of unhealthy and relatively calorie-dense food purchases. While income falls more in high-income households, food purchases and body weight decline more sharply in low-income households, suggesting that low-income households are particularly affected. Single-parent and female-headed households appear to suffer more significant declines in income, food purchases and body weight. Labor market participation does not significantly mitigate the impact of separation, while finding a new partner does.

The results of the study may come as a surprise. One possible interpretation is that households see their standard of living fall after separation, to the extent that they can no longer maintain a minimum level of consumption to meet their dietary needs, which translates into measurable weight loss. A priori, one might have expected that in countries with a well-developed welfare system such

as France, the fall in living standards would be cushioned by public and private transfers, so as to avoid at least the worst consequences by allowing a minimum level of necessary food consumption.

The results of this study are important from a policy perspective. If the above interpretation is correct, policy intervention to mitigate the effects in the most affected households could be justified on ethical grounds and to avoid the societal costs that could potentially arise from the negative effects associated with the inability to meet basic needs of nutrition. It may be argued that weight loss could have health benefits. However, an involuntary weight loss accompanied by a deterioration in diet quality is not healthy. The anticipation of a sharp decline in living standards might also discourage some spouses from separating in the first place, even if they would otherwise have preferred to do so. The author considers that the most likely explanation for the drop in food purchases and weight loss is direct financial constraints. Another possibility is that people simply prefer to lose weight after a separation, perhaps to increase their chances of finding a new partner. Separation could also lead to depression and loss of appetite, which could also explain the decrease in food consumption and weight loss. However, the greater reduction in food purchases and weight loss in low-income households, female-headed households and single-parent households runs counter to this argument. Systematic differences in weight loss preferences between these groups might exist but it likely that these differences are also ultimately driven by financial constraints and not due to some intrinsic and systematic differences in preferences for companionship. Spouses in low-income households and single parents might suffer more strongly from depression due to greater financial problems. They might also feel more financial pressure to regain their pre-separation standard of living by entering a new relationship and might lose weight to increase their chances in the dating market. In this case, the policy ramifications are less dramatic, as households are not prevented from meeting their basic food needs due to financial constraints. However, we could be concerned that a subset of the most vulnerable people are under pressure to enter into relationships that they would not have entered into in the absence of financial constraints.

To avoid the societal costs that could arise from the negative effects associated with the inability to meet basic nutritional needs, and to avoid situations of dependency that could lead people to enter and remain in potentially unhealthy relationships that may also result in significant personal and societal costs, I recommend that policy-makers ensure that the social safety net is sufficient to enable households to meet their basic needs after separation. A political priority could be the protection of single-parent families. Children are the least responsible for their situation and are also likely to be the most affected. Children may have to bear significant costs throughout their lives associated with lower economic resources, such as poorer mental and physical health and lower levels of education. These costs are also likely to translate into significant costs for society as a whole. Although not sufficiently documented, it is estimated that 35% of people in France do not receive the child support payments they are legally entitled to [Auvigne et al., 2016]. One option for policy makers is to insure that current legislation is fully implemented before considering increases in public assistance. The government's efforts to decrease the number of child support payment arrears through the creation in 2017 of the Agency for the Recovery of Child Support Arrears (ARIPA) have been deemed insufficient.[6]

[6]See for example `http://www.leparisien.fr/societe/christelle-dubos-nous-voulons-en-finir-avec-l-enfer-des-pensions-alimentaires-impayees-30-04-2019-8063001.php`.

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Appendix

Table A1: Summary statistics, pooled household-year observations

	Hh. observed ≥ 7 years		All households		
	Mean (std. dev.)	n	Mean (std. dev.)	n	Mean diff. (std. err.)
Household income (EUR)	2667.16 (1413.96)	80764	2646.61 (1419.32)	183870	20.56 (5.985)
Food quantity (kg)	764.84 (430.38)	80764	624.82 (435.28)	183870	140.0 (1.831)
BMI of female spouse	25.09 (4.74)	76876	24.92 (4.85)	173027	0.172 (0.0209)
Share of unhealthy food	0.19 (0.11)	80764	0.21 (0.12)	183870	-0.0202 (0.000502)
Household size	2.51 (1.32)	80764	2.61 (1.37)	183870	-0.0997 (0.00572)
Age Spouse 1	53.04 (14.85)	80764	47.66 (15.33)	183870	5.377 (0.0641)
Age Spouse 2	54.48 (15.02)	80764	49.1 (15.47)	183870	5.380 (0.0647)
Spouse 1 inactive = 1	0.41 (0.49)	80764	0.32 (0.47)	183870	0.0870 (0.00200)
Spouse 2 inactive = 1	0.37 (0.48)	80764	0.27 (0.44)	183870	0.0978 (0.00192)
Household calorie needs	3417.47 (1797.38)	77600	3508.97 (1801.73)	174641	-91.50 (7.767)
Meals at home per day	2.15 (1.12)	79975	2.17 (1.17)	175762	-0.0180 (0.00492)

Summary statistics of pooled household-year observations using all available household observations, compared to the sample restricted to households observed for at least 7 consecutive years. The last column shows mean differences with standard error in parenthesis.

Table A2: Statistics for France

	Mean	Description and source
Household income (EUR)	2918.7	Average household disposable income, *Revenus et patrimoine des ménages*, Insee here
BMI of female spouse	23,6	Insee, 2000 de Saint Pol [2006]
Household size	2.26	*Tableaux de l'économie française, Édition 2020*, Insee here
Age Spouse 1 (women)	42.0	*Âge moyen et âge médian de la population*, Insee, 2013 here
Age Spouse 2 (men)	39.1	*Âge moyen et âge médian de la population*, Insee, 2013 here
Spouse 1 (women) inactive = 1	0.35	*Tableaux de l'économie française Édition 2019, Population active*, Insee, 2013 here
Spouse 2 (men) inactive = 1	0.25	*Tableaux de l'économie française Édition 2019, Population active*, Insee, 2013 here

Statistics for France from diverse sources.

Table A3: Summary statistics, pooled household-year observations

	Treatment households, year of separation		Control households, Couple households only		
	Mean (std. dev.)	n	Mean (std. dev.)	n	Mean diff. (std. err.)
Household income (EUR)	2650.84 (1355.96)	1038	2977.1 (1434.33)	56303	-326.3 (-7.27)
Food quantity (kg)	737 (381.95)	1038	883.01 (423.32)	56303	-146.0 (-11.03)
BMI of female spouse	24.84 (4.8)	992	24.96 (4.73)	53620	-0.116 (-0.77)
Share of unhealthy food	0.22 (0.12)	1038	0.19 (0.11)	56303	0.0285 (8.49)
Household size	3.03 (1.16)	1038	3.04 (1.14)	56303	-0.0114 (-0.32)
Age Spouse 1	49.16 (16.05)	1038	50.95 (13.72)	56303	-1.787 (-4.14)
Age Spouse 2	49.34 (17.92)	1038	52.96 (14.09)	56303	-3.625 (-8.16)
Spouse 1 inactive = 1	0.33 (0.47)	1038	0.37 (0.48)	56303	-0.0366 (-2.43)
Spouse 2 inactive = 1	0.3 (0.46)	1038	0.31 (0.46)	56303	-0.0163 (-1.12)
Household calorie needs	4060.53 (1534.27)	999	4117.07 (1581.54)	54095	-56.54 (-1.12)
Meals at home per day	2.24 (1.03)	1023	2.56 (0.98	55781	-0.324 (-40.79)

Summary statistics of treated households in the year of separation and control couple households. The last column shows mean differences with standard error in parenthesis.

Table A4: Household observations by year of distance to separation

Distance to separation	Nb. of households observed
-7	71
-6	162
-5	259
-4	345
-3	545
-2	787
-1	1038
0	1038
1	1038
2	697
3	465
4	226
5	111
6	88
7	54
8	28

Number of treated households observed by year of distance to separation. Example: 7 years prior to separation, 71 households are observed.

Table A5: Main results - Evolution of the outcome variables around the time of separation

	Income (log)	Food quantity (log)	BMI (log)	Unhealthy food (share)
Event time -7	-0.0172	-0.0771	0.00551	-0.0144*
	(0.028)	(0.047)	(0.005)	(0.006)
Event time -6	0.00922	-0.0270	0.00474	-0.0153**
	(0.018)	(0.032)	(0.004)	(0.005)
Event time -5	0.00555	-0.0683	0.00436	-0.0137**
	(0.016)	(0.038)	(0.003)	(0.005)
Event time -4	-0.0293	-0.0579	0.00174	-0.0118***
	(0.018)	(0.030)	(0.003)	(0.004)
Event time -3	-0.00720	-0.0116	-0.000926	-0.00894**
	(0.012)	(0.025)	(0.002)	(0.003)
Event time -2	0.00460	-0.0395	0.000552	-0.00629**
	(0.007)	(0.023)	(0.001)	(0.002)
Event time -1	0	0	0	0
	(.)	(.)	(.)	(.)
Event time 0	-0.0524***	0.0135	-0.00469***	0.00208
	(0.009)	(0.019)	(0.001)	(0.002)
Event time 1	-0.177***	-0.186***	-0.0126***	0.00953**
	(0.013)	(0.029)	(0.002)	(0.003)
Event time 2	-0.249***	-0.288***	-0.0161***	0.0100**
	(0.016)	(0.033)	(0.003)	(0.004)
Event time 3	-0.258***	-0.314***	-0.0118***	0.00566
	(0.019)	(0.040)	(0.003)	(0.005)
Event time 4	-0.239***	-0.331***	0.000440	0.00723
	(0.024)	(0.053)	(0.005)	(0.006)
Event time 5	-0.249***	-0.380***	-0.00153	0.00402
	(0.034)	(0.072)	(0.006)	(0.007)
Event time 6	-0.246***	-0.222***	0.00592	0.000121
	(0.034)	(0.056)	(0.007)	(0.008)
Event time 7	-0.217***	-0.129	-0.000846	-0.00368
	(0.043)	(0.068)	(0.009)	(0.011)
Event time 8	-0.292***	-0.133	-0.00744	-0.00598
	(0.061)	(0.080)	(0.011)	(0.011)
Household size	0.0590***	0.111***	0.00116	-0.000366
	(0.004)	(0.009)	(0.001)	(0.001)
Spouse 1 is inactive = 1	-0.0394***	0.0334**	0.00327*	-0.00679***
	(0.007)	(0.012)	(0.002)	(0.002)
Spouse 2 is inactive = 1	-0.0327***	-0.00179	0.000728	-0.000174
	(0.008)	(0.013)	(0.002)	(0.002)
Nb. meals at home		0.0541***	0.000536	0.00213*
		(0.007)	(0.001)	(0.001)
Log Household calorie needs		0.186***		0.0105***
		(0.021)		(0.003)
Constant	7.392***	11.15***	3.122***	0.103***
	(0.088)	(0.219)	(0.021)	(0.029)
Observations	82105	78145	77389	78145
R^2	0.154	0.100	0.033	0.050
Year fixed effects	Yes	Yes	Yes	Yes
Household fixed effects	Yes	Yes	Yes	Yes
Spouses' age dummies	Yes	Yes	Yes	Yes

Robust standard errors clustered at the level of the household in parenthesis. The dependent variables are the logarithm of household disposable income, logarithm of household food quantities purchased, the logarithm of the BMI of the spouse that remains observed in the household after separation and the share of unhealthy food products purchased over the total amount of food purchased. All models include household and year fixed effects both spouse's age dummies.

Table A6: Robustness - Evolution of the outcome variables in levels and per capita around the time of separation

	Income	Food purchases	BMI	Income (p.cap.)	Food purchases (p.cap.)
Event time -7	-28.07	0.0562	0.157	-0.0154	-0.0739
	(72.654)	(35.054)	(0.138)	(0.028)	(0.045)
Event time -6	12.88	13.57	0.118	0.00364	-0.0283
	(49.607)	(22.820)	(0.104)	(0.018)	(0.033)
Event time -5	13.01	5.238	0.110	0.00347	-0.0677
	(46.535)	(21.262)	(0.086)	(0.016)	(0.038)
Event time -4	-36.18	-7.159	0.0596	-0.0226	-0.0511
	(44.234)	(17.648)	(0.083)	(0.017)	(0.029)
Event time -3	-3.317	12.76	-0.0172	-0.00287	-0.00860
	(31.323)	(13.443)	(0.057)	(0.013)	(0.025)
Event time -2	9.140	1.095	0.0233	0.00768	-0.0373
	(18.223)	(10.892)	(0.040)	(0.008)	(0.023)
Event time -1	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
Event time 0	-119.6***	-40.48***	-0.111**	-0.0645***	0.00474
	(23.543)	(9.513)	(0.036)	(0.009)	(0.019)
Event time 1	-382.4***	-110.6***	-0.310***	-0.0402**	-0.0907**
	(35.337)	(12.524)	(0.053)	(0.014)	(0.028)
Event time 2	-544.8***	-148.3***	-0.394***	-0.112***	-0.190***
	(41.719)	(14.319)	(0.069)	(0.017)	(0.033)
Event time 3	-568.1***	-140.6***	-0.283***	-0.121***	-0.215***
	(49.262)	(16.352)	(0.084)	(0.019)	(0.039)
Event time 4	-487.7***	-130.1***	0.0216	-0.108***	-0.234***
	(73.734)	(20.249)	(0.120)	(0.024)	(0.053)
Event time 5	-495.2***	-160.6***	-0.0387	-0.116***	-0.281***
	(106.635)	(28.294)	(0.169)	(0.032)	(0.071)
Event time 6	-499.0***	-107.4***	0.120	-0.101**	-0.111*
	(102.740)	(29.424)	(0.202)	(0.034)	(0.056)
Event time 7	-411.3**	-61.69	-0.0778	-0.0784	-0.0245
	(137.888)	(35.585)	(0.232)	(0.043)	(0.066)
Event time 8	-567.6***	-77.36	-0.304	-0.124	-0.00590
	(138.082)	(55.764)	(0.331)	(0.067)	(0.077)
Household size	154.0***	103.8***	0.0297	-0.295***	-0.209***
	(11.079)	(5.900)	(0.020)	(0.004)	(0.009)
Spouse 1 is inactive = 1	-110.8***	29.07***	0.0985*	-0.0357***	0.0342**
	(21.981)	(8.500)	(0.043)	(0.007)	(0.012)
Spouse 2 is inactive = 1	-83.50**	-10.04	0.0167	-0.0393***	-0.00666
	(26.690)	(8.486)	(0.043)	(0.008)	(0.013)
Nb. meals at home		44.90***	0.0131		0.0716***
		(4.172)	(0.017)		(0.008)
Log Household calorie needs		0.0163***			0.0000189**
		(0.004)			(0.000)
Constant	1392.1***	440.0***	23.02***	7.509***	12.60***
	(195.320)	(80.713)	(0.489)	(0.117)	(0.153)
Observations	82105	78145	77389	82105	78145
R^2	0.128	0.130	0.029	0.398	0.076
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Household fixed effects	Yes	Yes	Yes	Yes	Yes
Spouses' age dummies	Yes	Yes	Yes	Yes	Yes

Robust standard errors clustered at the level of the household in parenthesis. The dependent variables are disposable household income, household food quantities purchased, the BMI of the spouse that remains observed in the household after separation, per capital household income and per capita household food quantities purchased. All models include household and year fixed effects and household size.

Table A7: Evolution of meals eaten at home and spouse's job market status around the time of separation

	Nb. meals	Spouse inactive = 1
Event time -7	0.0956	0.0162
	(0.050)	(0.023)
Event time -6	0.0364	0.00835
	(0.028)	(0.020)
Event time -5	0.0709**	0.00517
	(0.027)	(0.017)
Event time -4	0.0531*	-0.000790
	(0.023)	(0.013)
Event time -3	0.0208	-0.000954
	(0.013)	(0.010)
Event time -2	0.0279*	0.00285
	(0.012)	(0.006)
Event time -1	0	0
	(.)	(.)
Event time 0	-0.0855***	-0.0154*
	(0.010)	(0.006)
Event time 1	0.234***	-0.0289***
	(0.018)	(0.008)
Event time 2	0.0892***	-0.0368***
	(0.018)	(0.010)
Event time 3	0.0674***	-0.0258*
	(0.018)	(0.013)
Event time 4	0.111*	-0.0405**
	(0.048)	(0.015)
Event time 5	0.136	-0.0252
	(0.082)	(0.024)
Event time 6	-0.0000384	-0.0377
	(0.042)	(0.027)
Event time 7	-0.0314	-0.0351
	(0.055)	(0.037)
Event time 8	-0.0812	-0.0676
	(0.112)	(0.040)
Constant	0.900***	0.445***
	(0.004)	(0.003)
Observations	81246	82105
R^2	0.012	0.022
Year fixed effects	Yes	Yes
Household fixed effects	Yes	Yes

Robust standard errors clustered at the level of the household in parenthesis. The dependent variables are the average number of meals eaten at home in a typical week and the job market status of the spouse who remains observed in the household after the separation in terms of a dummy variable equal to one if the spouse is inactive.

Table A8: Robustness - Evolution of income around the time of separation, different model specifications

	Household disposable income		
	(1)	(2)	(3)
Event time -7	0.00147	-0.0173	-0.0172
	(0.028)	(0.028)	(0.028)
Event time -6	0.0178	0.00993	0.00922
	(0.018)	(0.018)	(0.018)
Event time -5	0.0128	0.00565	0.00555
	(0.016)	(0.016)	(0.016)
Event time -4	-0.0226	-0.0289	-0.0293
	(0.018)	(0.018)	(0.018)
Event time -3	-0.00622	-0.00695	-0.00720
	(0.013)	(0.012)	(0.012)
Event time -2	0.00399	0.00465	0.00460
	(0.007)	(0.007)	(0.007)
Event time -1	0	0	0
	(.)	(.)	(.)
Event time 0	-0.0514***	-0.0517***	-0.0524***
	(0.009)	(0.009)	(0.009)
Event time 1	-0.150***	-0.177***	-0.177***
	(0.013)	(0.013)	(0.013)
Event time 2	-0.222***	-0.249***	-0.249***
	(0.015)	(0.016)	(0.016)
Event time 3	-0.231***	-0.258***	-0.258***
	(0.018)	(0.019)	(0.019)
Event time 4	-0.215***	-0.238***	-0.239***
	(0.024)	(0.024)	(0.024)
Event time 5	-0.236***	-0.250***	-0.249***
	(0.034)	(0.034)	(0.034)
Event time 6	-0.237***	-0.246***	-0.246***
	(0.035)	(0.034)	(0.034)
Event time 7	-0.210***	-0.217***	-0.217***
	(0.043)	(0.043)	(0.043)
Event time 8	-0.283***	-0.287***	-0.292***
	(0.060)	(0.061)	(0.061)
Household size	0.0720***	0.0586***	0.0590***
	(0.004)	(0.004)	(0.004)
Spouse 1 is inactive = 1			-0.0394***
			(0.007)
Spouse 2 is inactive = 1			-0.0327***
			(0.008)
Constant	7.654***	7.313***	7.392***
	(0.009)	(0.089)	(0.088)
Observations	82105	82105	82105
R^2	0.126	0.152	0.154
Year fixed effects	Yes	Yes	Yes
Household fixed effects	Yes	Yes	Yes
Spouses' age dummies	No	Yes	Yes

Robust standard errors clustered at the level of the household in parenthesis. All models include household and year fixed effects and household size.

Table A9: Robustness - Evolution of food quantities purchased around the time of separation, different model specifications

	Household food quantities purchased				
	(1)	(2)	(3)	(4)	(5)
Event time -7	0.00947	-0.0169	-0.0177	-0.0452	-0.0755
	(0.045)	(0.045)	(0.045)	(0.048)	(0.048)
Event time -6	-0.0451	-0.0544	-0.0549	-0.0348	-0.0254
	(0.043)	(0.041)	(0.041)	(0.039)	(0.032)
Event time -5	-0.0209	-0.0302	-0.0302	-0.0409	-0.0670
	(0.038)	(0.038)	(0.038)	(0.039)	(0.038)
Event time -4	-0.0454	-0.0537	-0.0537	-0.0509	-0.0578
	(0.031)	(0.031)	(0.031)	(0.032)	(0.030)
Event time -3	0.00423	-0.00138	-0.00126	-0.00443	-0.0132
	(0.025)	(0.025)	(0.025)	(0.026)	(0.025)
Event time -2	-0.0374	-0.0388	-0.0389	-0.0326	-0.0403
	(0.023)	(0.023)	(0.023)	(0.024)	(0.023)
Event time -1	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
Event time 0	0.0411*	0.0414*	0.0419*	0.0414*	0.0157
	(0.020)	(0.020)	(0.020)	(0.021)	(0.019)
Event time 1	-0.161***	-0.204***	-0.203***	-0.201***	-0.225***
	(0.028)	(0.028)	(0.028)	(0.029)	(0.028)
Event time 2	-0.306***	-0.349***	-0.348***	-0.318***	-0.327***
	(0.034)	(0.035)	(0.035)	(0.033)	(0.033)
Event time 3	-0.309***	-0.349***	-0.349***	-0.345***	-0.353***
	(0.038)	(0.038)	(0.038)	(0.039)	(0.039)
Event time 4	-0.331***	-0.371***	-0.371***	-0.371***	-0.366***
	(0.054)	(0.054)	(0.054)	(0.055)	(0.054)
Event time 5	-0.403***	-0.415***	-0.415***	-0.414***	-0.414***
	(0.070)	(0.071)	(0.071)	(0.072)	(0.072)
Event time 6	-0.275***	-0.269***	-0.269***	-0.265***	-0.258***
	(0.054)	(0.056)	(0.056)	(0.057)	(0.056)
Event time 7	-0.176**	-0.183**	-0.182**	-0.175*	-0.166*
	(0.065)	(0.068)	(0.068)	(0.069)	(0.069)
Event time 8	-0.181*	-0.203*	-0.202*	-0.192*	-0.176*
	(0.078)	(0.079)	(0.079)	(0.080)	(0.080)
Household size	0.184***	0.159***	0.158***	0.137***	0.139***
	(0.006)	(0.007)	(0.007)	(0.010)	(0.009)
Spouse 1 is inactive = 1			0.0275*	0.0322*	0.0317*
			(0.013)	(0.013)	(0.012)
Spouse 2 is inactive = 1			-0.00785	-0.0104	-0.000617
			(0.014)	(0.014)	(0.013)
Log household calorie needs				0.0000172**	0.0000213***
				(0.000)	(0.000)
Nb. meals at home					0.0511***
					(0.007)
Constant	12.78***	12.42***	12.40***	12.46***	12.50***
	(0.017)	(0.167)	(0.168)	(0.166)	(0.158)
Observations	82105	82105	82105	78872	78145
R^2	0.082	0.093	0.093	0.093	0.098
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Household fixed effects	Yes	Yes	Yes	Yes	Yes
Spouses' age dummies	No	Yes	Yes	Yes	Yes

Robust standard errors clustered at the level of the household in parenthesis.
All models include household and year fixed effects and household size.

Table A10: Robustness - Evolution of spouse's BMI around the time of separation, different model specifications

	Spouse's BMI				
	(1)	(2)	(3)	(4)	(5)
Event time -7	0.00857	0.00558	0.00548	0.00452	0.00444
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Event time -6	0.00646	0.00436	0.00436	0.00433	0.00450
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Event time -5	0.00545	0.00440	0.00440	0.00425	0.00416
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Event time -4	0.00207	0.00141	0.00143	0.00154	0.00173
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Event time -3	-0.00132	-0.00141	-0.00139	-0.00102	-0.000653
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Event time -2	0.000641	0.000514	0.000516	0.000659	0.000617
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Event time -1	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
Event time 0	-0.00461**	-0.00456**	-0.00451**	-0.00450**	-0.00478***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Event time 1	-0.0104***	-0.0125***	-0.0125***	-0.00824***	-0.00837***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Event time 2	-0.0137***	-0.0159***	-0.0159***	-0.0120***	-0.0122***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Event time 3	-0.00942**	-0.0115***	-0.0115***	-0.00757*	-0.00785*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Event time 4	0.00182	0.000560	0.000654	0.00404	0.00377
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Event time 5	-0.00146	-0.00130	-0.00133	0.00218	0.00193
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Event time 6	0.00556	0.00605	0.00610	0.00954	0.00933
	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
Event time 7	-0.00123	-0.000786	-0.000656	0.00337	0.00314
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Event time 8	-0.00814	-0.00751	-0.00717	-0.00355	-0.00384
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Household size	0.00145*	0.00119	0.00114	-0.0109***	-0.0110***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Spouse 1 is inactive = 1			0.00351*	0.00424**	0.00401*
			(0.002)	(0.002)	(0.002)
Spouse 2 is inactive = 1			0.000962	0.000853	0.000599
			(0.002)	(0.002)	(0.002)
Household calorie needs				0.0000106***	0.0000107***
				(0.000)	(0.000)
Nb. meals at home					0.000773
					(0.001)
Constant	3.210***	3.126***	3.122***	3.114***	3.114***
	(0.002)	(0.020)	(0.021)	(0.019)	(0.020)
Observations	78105	78105	78105	78104	77388
R^2	0.021	0.032	0.033	0.042	0.042
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Household fixed effects	Yes	Yes	Yes	Yes	Yes
Spouses' age dummies	No	Yes	Yes	Yes	Yes

Robust standard errors clustered at the level of the household in parenthesis.
All models include household and year fixed effects and household size.

Table A11: Robustness - Evolution of share of unhealthy food products around the time of separation, different model specifications

	Share of unhealthy food products purchased				
	(1)	(2)	(3)	(4)	(5)
Event time -7	-0.0171**	-0.0154**	-0.0153**	-0.0148*	-0.0148*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Event time -6	-0.0187***	-0.0178***	-0.0178***	-0.0155**	-0.0153**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Event time -5	-0.0144**	-0.0139**	-0.0139**	-0.0132**	-0.0137**
	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)
Event time -4	-0.0128***	-0.0122***	-0.0122***	-0.0118***	-0.0118***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Event time -3	-0.0106***	-0.0106***	-0.0106***	-0.00914**	-0.00896**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Event time -2	-0.00697***	-0.00749***	-0.00748***	-0.00713***	-0.00634**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Event time -1	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
Event time 0	0.000998	0.00159	0.00148	0.00159	0.00215
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Event time 1	0.00709*	0.00623*	0.00620*	0.00837**	0.00872**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Event time 2	0.00667	0.00579	0.00569	0.00834*	0.00914*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Event time 3	0.00308	0.00259	0.00258	0.00440	0.00475
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Event time 4	0.00621	0.00599	0.00583	0.00626	0.00629
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Event time 5	0.00366	0.00179	0.00181	0.00299	0.00319
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Event time 6	-0.000707	-0.00210	-0.00221	-0.00140	-0.000975
	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
Event time 7	-0.00508	-0.00483	-0.00495	-0.00498	-0.00455
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)
Event time 8	-0.00867	-0.00860	-0.00917	-0.00775	-0.00724
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Household size	0.00394***	0.00246**	0.00256**	-0.00316**	-0.00301*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Spouse 1 is inactive = 1			-0.00726***	-0.00633***	-0.00659***
			(0.002)	(0.002)	(0.002)
Spouse 2 is inactive = 1			-0.000778	-0.000445	-0.000139
			(0.002)	(0.002)	(0.002)
Household calorie needs				0.00000489***	0.00000499***
				(0.000)	(0.000)
Nb. meals at home					0.00203*
					(0.001)
Constant	0.185***	0.176***	0.184***	0.176***	0.176***
	(0.002)	(0.019)	(0.019)	(0.020)	(0.020)
Observations	82105	82105	82105	78872	78145
R^2	0.034	0.048	0.049	0.049	0.051
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Household fixed effects	Yes	Yes	Yes	Yes	Yes
Spouses' age dummies	No	Yes	Yes	Yes	Yes

Robust standard errors clustered at the level of the household in parenthesis.
All models include household and year fixed effects and household size.

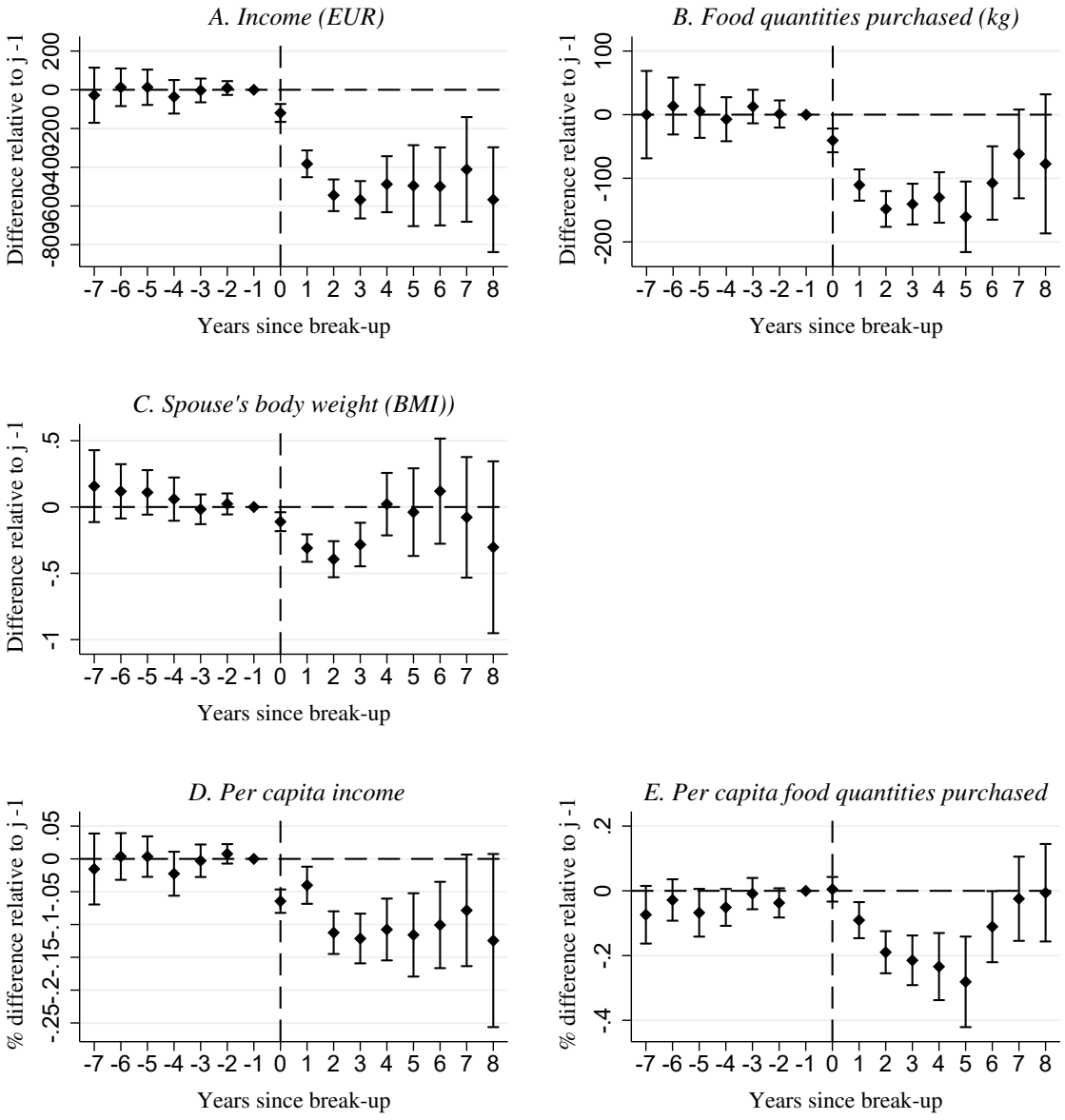


Figure A1: Trend in outcome variables around separation using the original non-transformed dependent variables and per capita income and food purchases.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The dependent variable are the income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), the share of unhealthy food products purchased, per capita income and per capita food quantities purchased in household i in year j. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

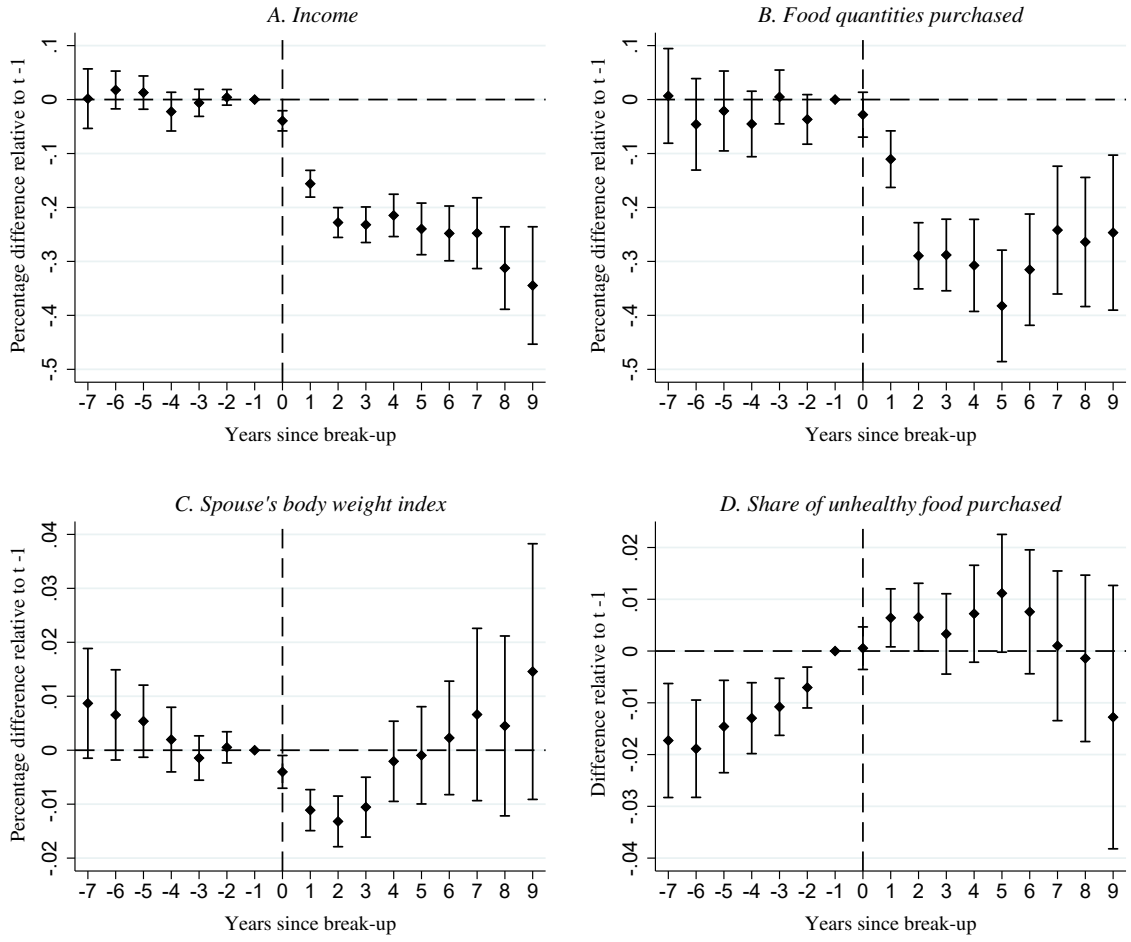


Figure A2: Trend in outcome variables from regressions including only household and year fixed effects and household size.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The dependent variable are the logarithm of household disposable income, the logarithm of household food quantities purchased, the logarithm of the body mass index (a measure of corpulence, results for body weight are the same) of the spouse who remains observed in the household after the separation and the share of unhealthy food products purchased over total food quantity purchased in household i in year j. The controls include household and year fixed effects and household size. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

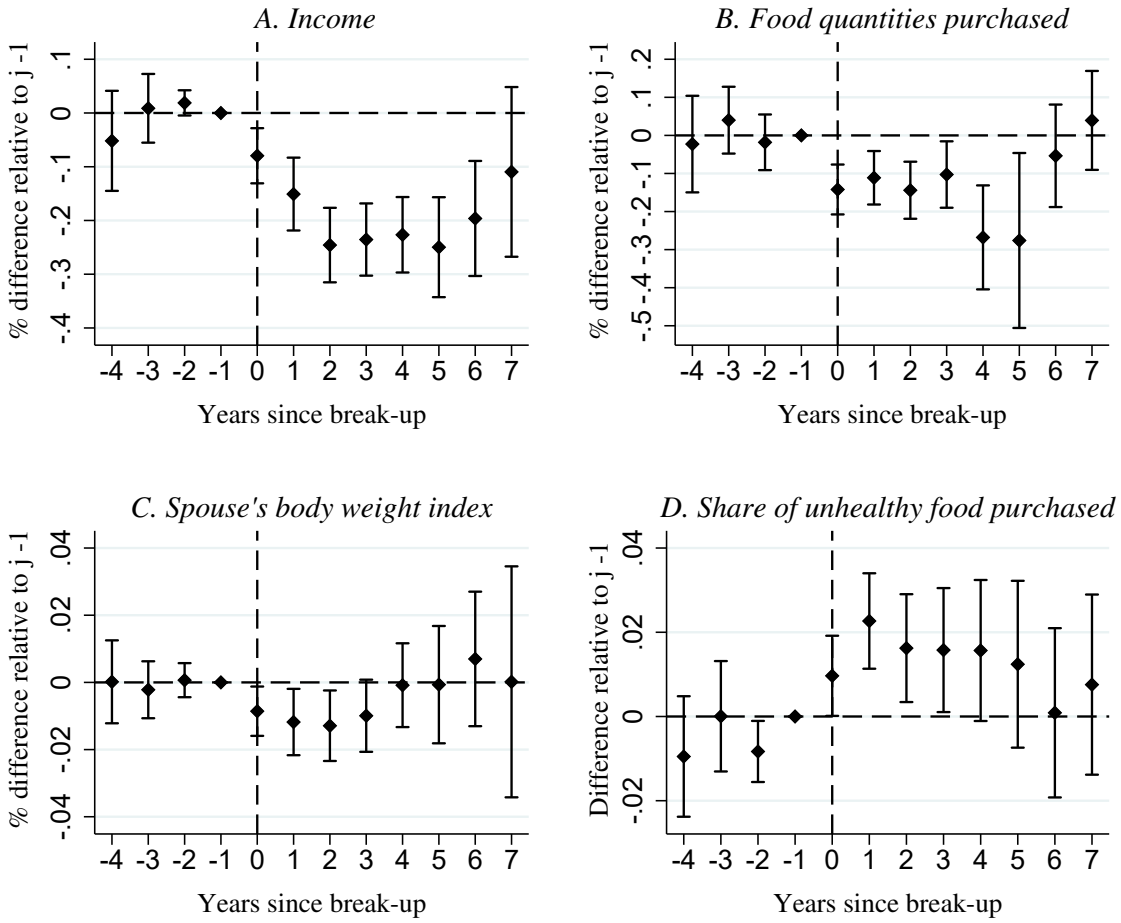


Figure A3: Trend in outcome variables around separation excluding treated households that are observed less than 2 periods before separation and less than 4 periods after separation.
Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The event-time coefficients -2 to 4 are estimated off of the same 154 households, whereas the event-time coefficients $-5, -4$ and -3 are based on variation from 25, 30 and 60 households and the event-time coefficients $5, 6$ and 7 are based on $57, 44$ and 21 households. The dependent variable are the income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), the share of unhealthy food products purchased, per capita income and per capita food quantities purchased in household i in year j. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

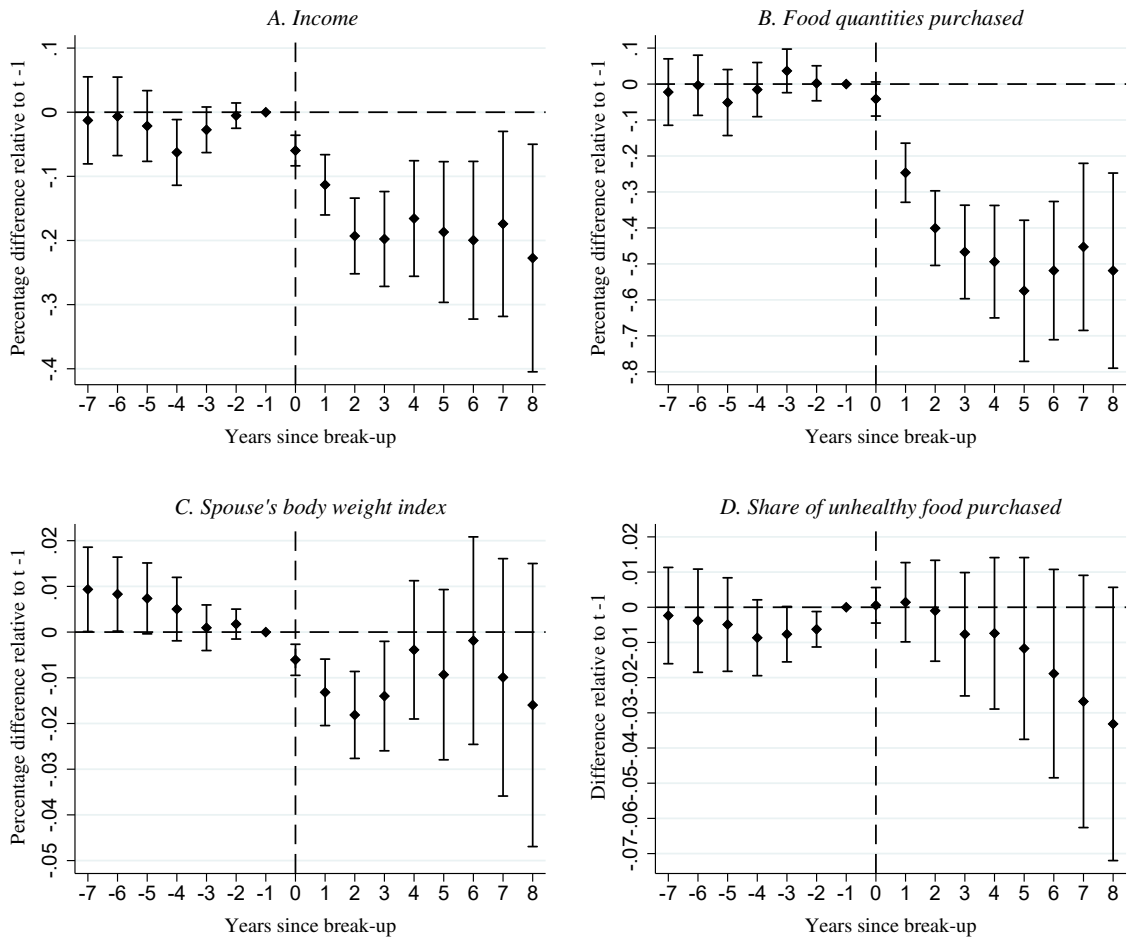


Figure A4: Trend in outcome variables around separation excluding untreated households from the regression.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The dependent variable are the income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), the share of unhealthy food products purchased, per capita income and per capita food quantities purchased in household i in year j. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

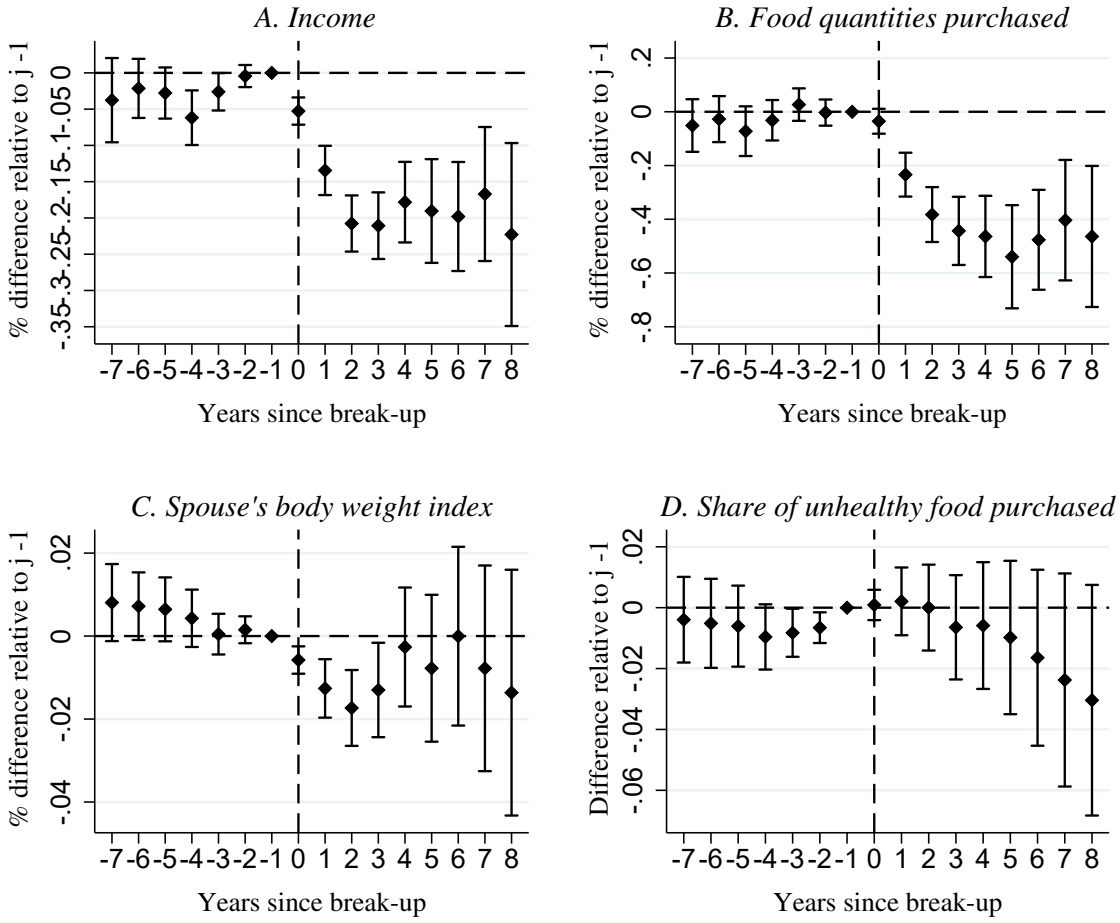


Figure A5: Trend in outcome variables around separation including only 4,623 untreated households with the highest propensity score.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The dependent variable are the income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), the share of unhealthy food products purchased, per capita income and per capita food quantities purchased in household i in year j. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

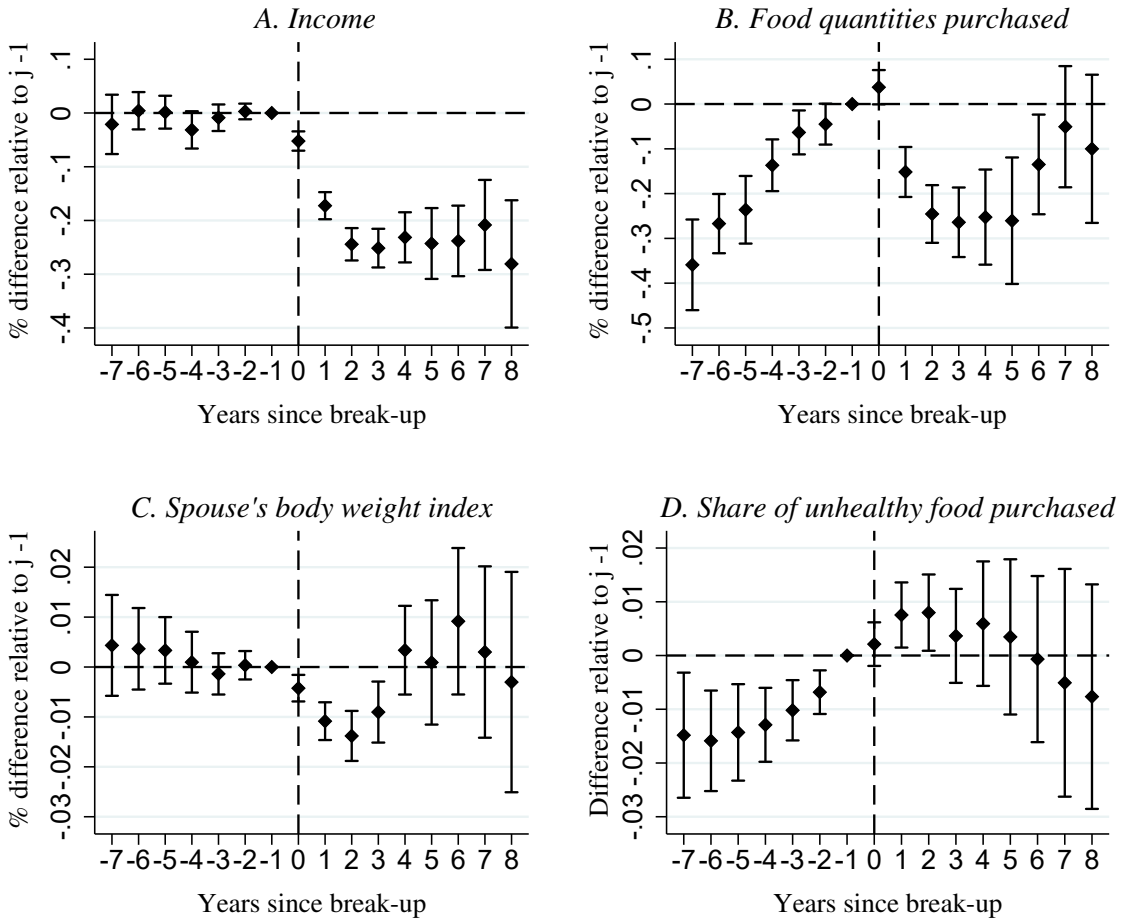


Figure A6: Trend in outcome variables around separation excluding including untreated households that are observed less than 7 consecutive periods.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The event-time coefficients -2 to 4 are estimated off of the same 154 households, whereas the event-time coefficients $-5, -4$ and -3 are based on variation from 25, 30 and 60 households and the event-time coefficients $5, 6$ and 7 are based on $57, 44$ and 21 households. The dependent variable are the income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), the share of unhealthy food products purchased, per capita income and per capita food quantities purchased in household i in year j. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

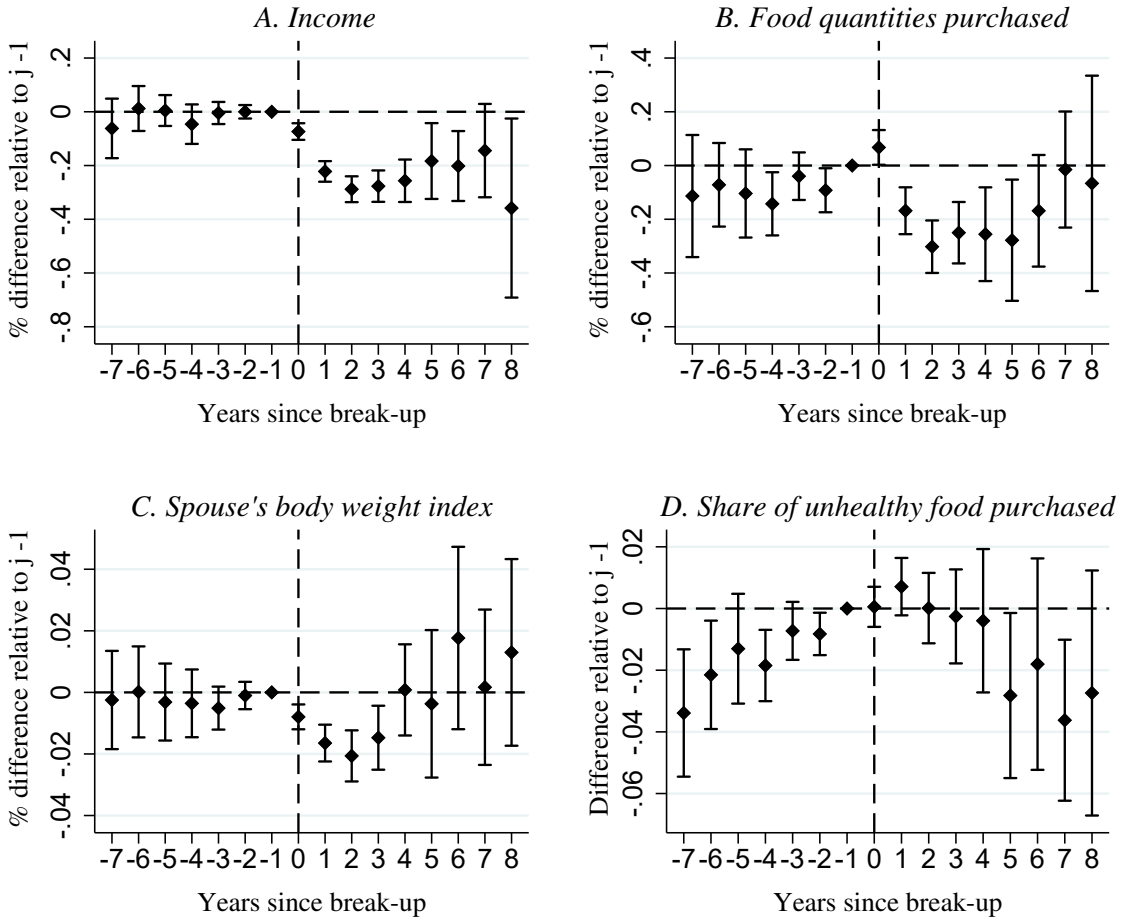


Figure A7: Trend in outcome variables around separation excluding treated households where one of the partners is older than 45 years at the time of separation.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The dependent variable are the income, food quantities purchased, remaining spouse's body mass index (a measure of corpulence, results for body weight are the same), the share of unhealthy food products purchased, per capita income and per capita food quantities purchased in household i in year j. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

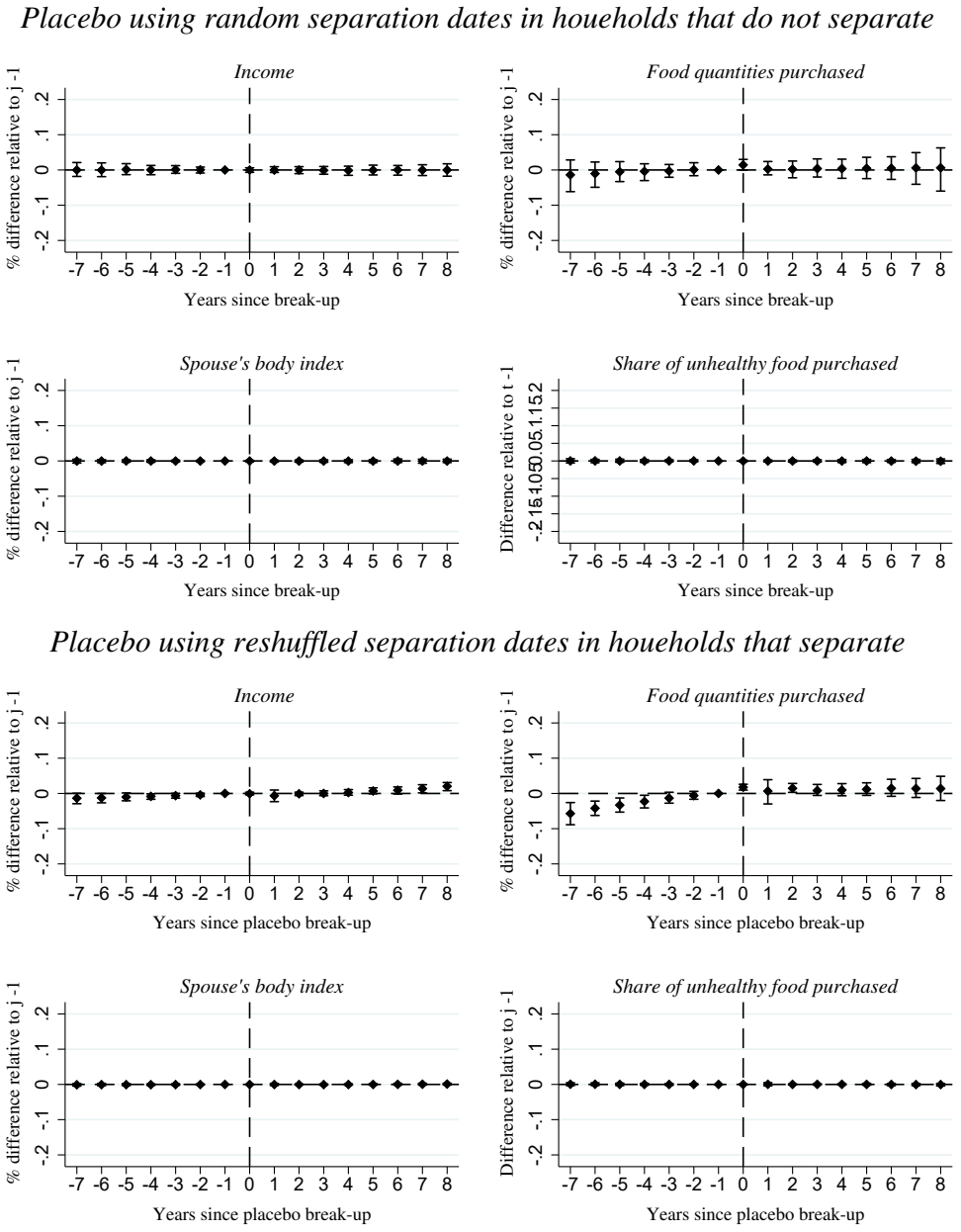


Figure A8: Trend in outcome variables around placebo dates of separation.
Note: The figure shows the mean and the 95th percentile of the coefficient distributions of placebo exercises, that is placebo event time coefficients relative to the placebo control group of households and relative to the year just before the placebo date of separation ($j = -1$). The upper four graphs show the effects using random separation dates in households that do not separate, while the lower four graphs show the effects of using randomly reassigned dates of separation in the households that separate. The dependent variable are the logarithm of income, food quantities purchased, remaining spouse's BMI, and the share of unhealthy food products purchased in household i in year t. The controls include household and year fixed effects, spouse's age and labor market status and household size (to adjust for changes in household size besides separation). The data cover the period from 2005 to 2015.

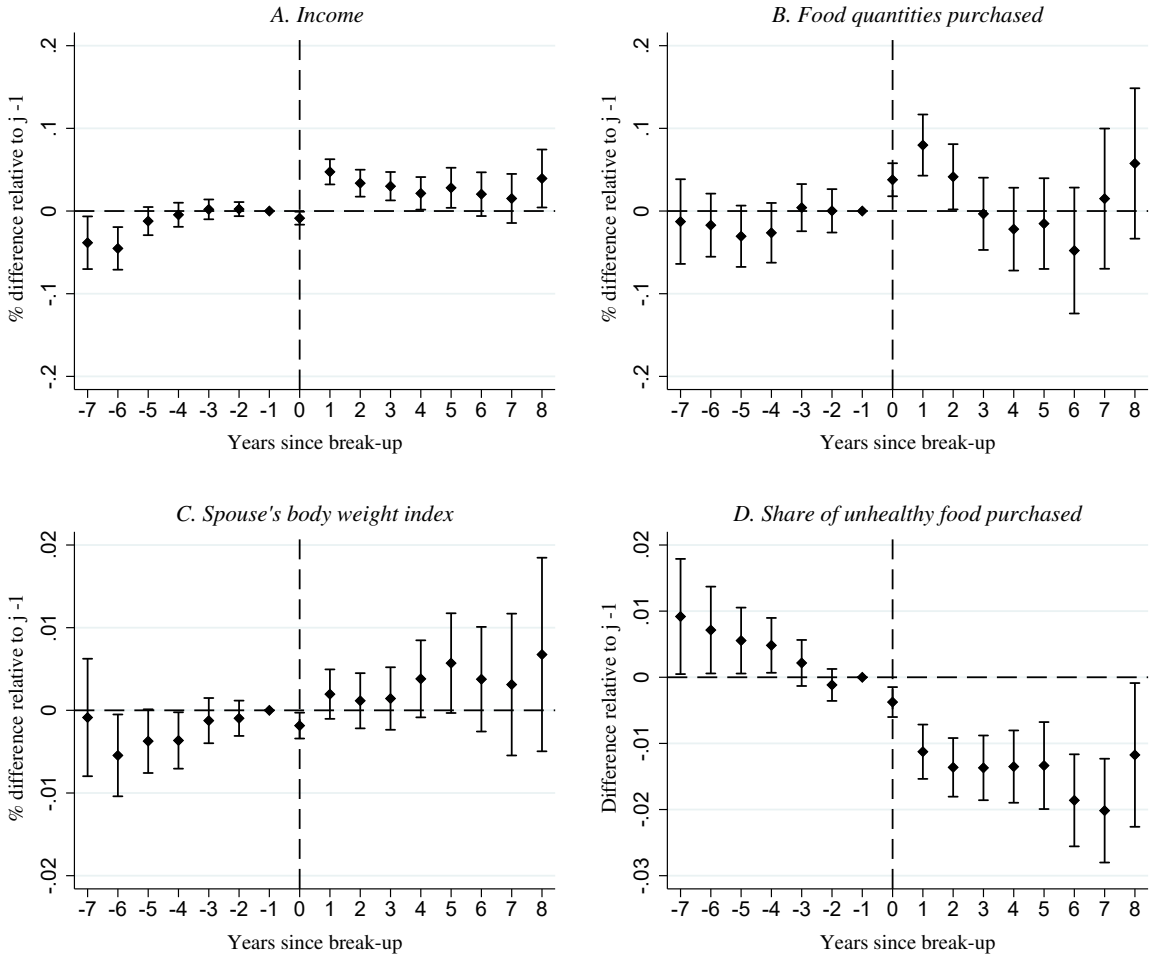


Figure A9: Trend in outcome variables around the time another person than the spouse leaves the household.

Note: The figure shows event time coefficients relative to the control group of households where no person other than the spouse leaves the household and relative to the year just before the person other than the spouse leaves the household ($j = -1$). The dependent variable are the logarithm of income, food quantities purchased, female spouse's BMI, and the share of unhealthy food products purchased in household i in year t. The controls include household and year fixed effects, spouse's age and labor market status and household size (to adjust for changes in household size besides separation). The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

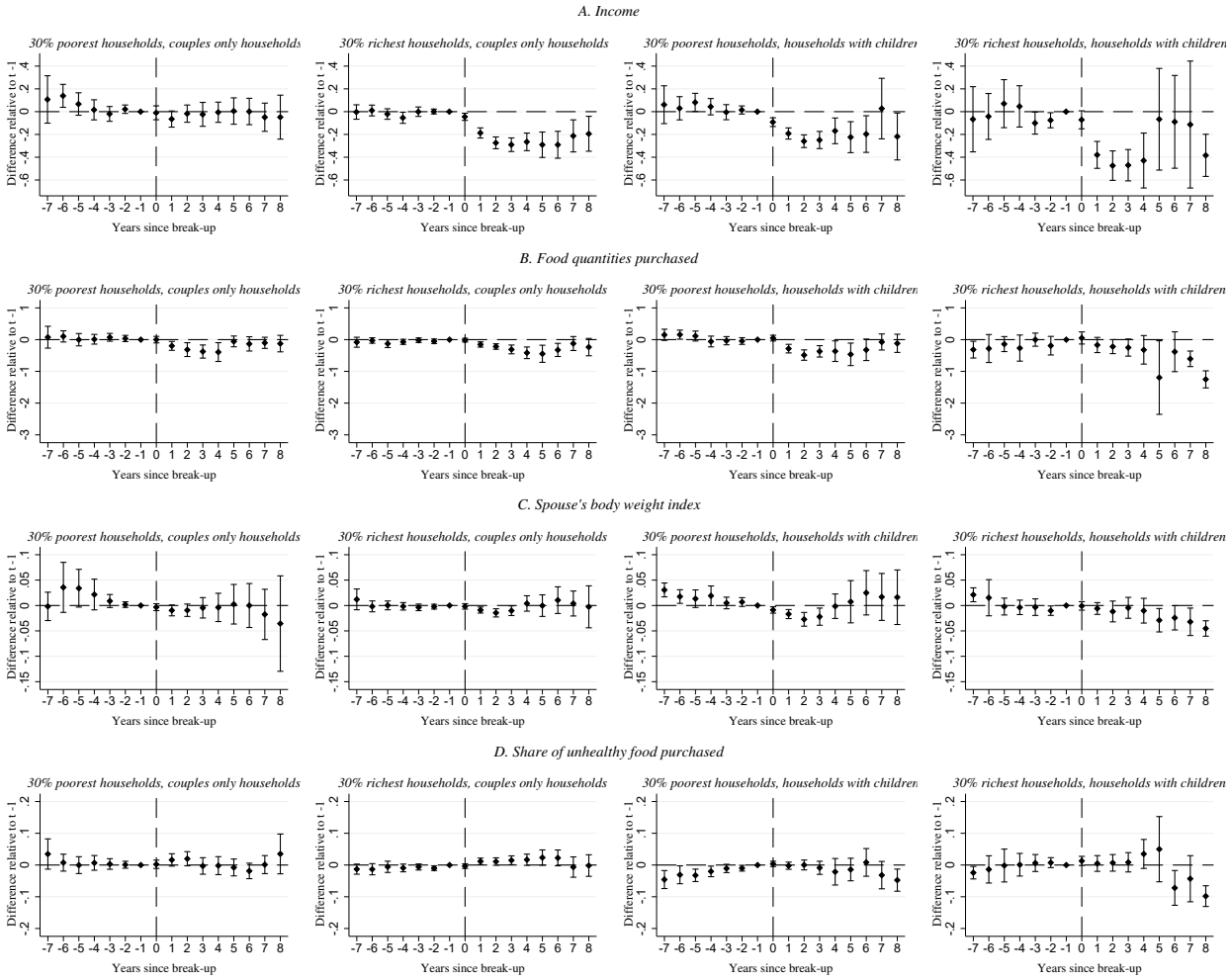


Figure A10: Trend in outcome variables around separation, by family composition and pre-separation income.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The panels show the results of separate regressions for household groups divided by pre-separation household income and family composition (couple-only households or households with children aged under 18 at the time of the separation). The dependent variable are the logarithm of income, food quantities purchased, remaining spouse's BMI, and the share of unhealthy food products purchased in household i in year t. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

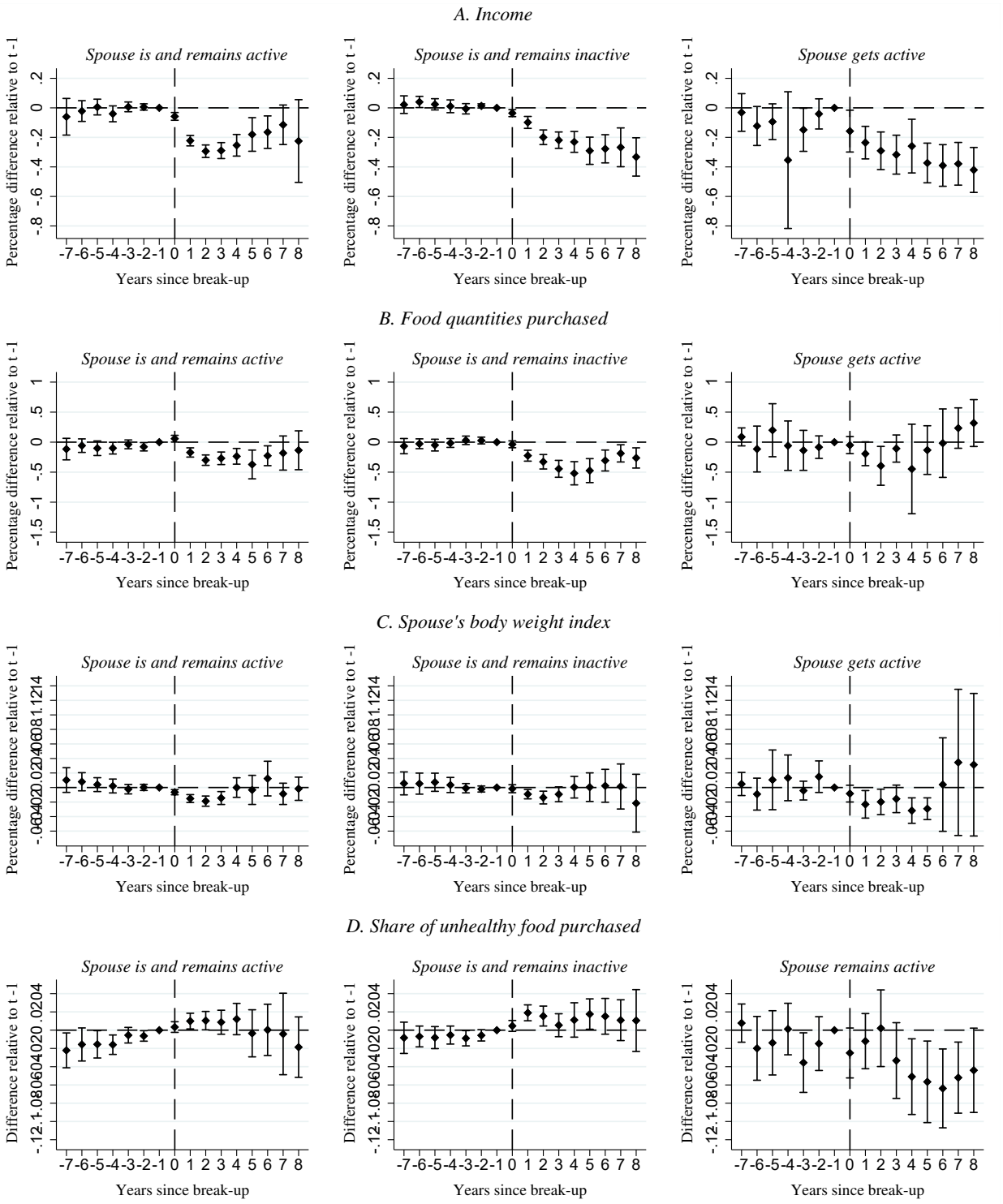
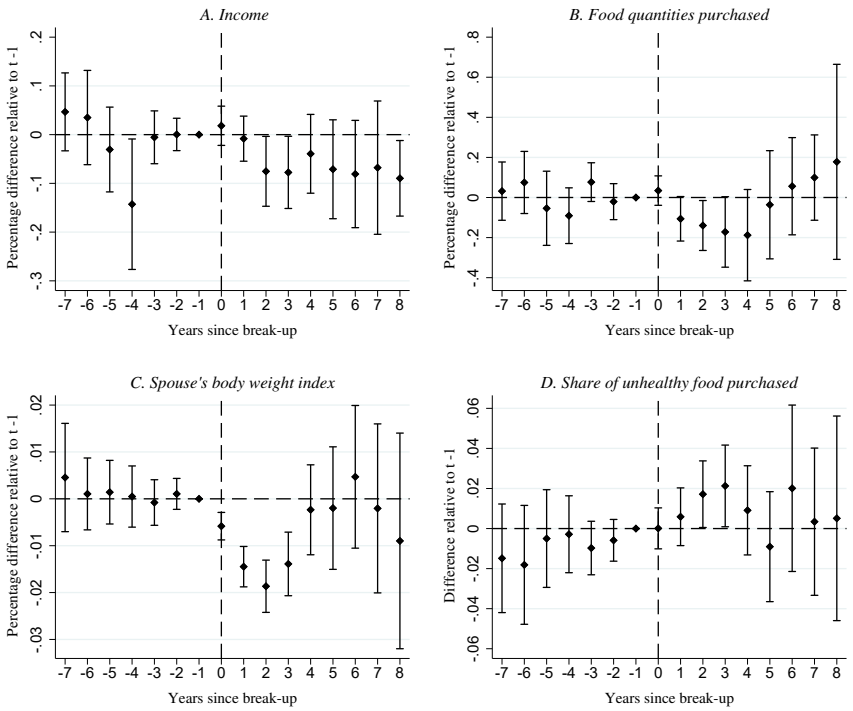
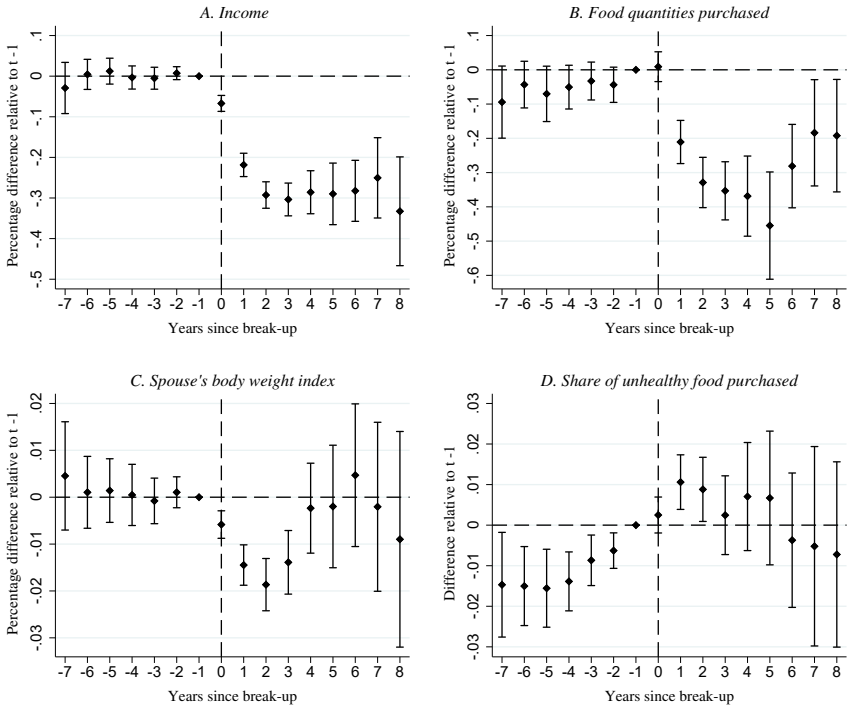


Figure A11: Trend in outcome variables around separation, by employment status of the spouse who remains in the household.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The left-hand panels present results for households where the remaining spouse becomes employed after the separation (47 cases), while the right-hand panels show results for households where the remaining spouse is and remains unemployed over time. The dependent variable are the logarithm of income, food quantities purchased, remaining spouse's BMI, and the share of unhealthy food products purchased in household i in year t. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. In the regressions on BMI I include in addition the average number of meals eaten at home in a typical week and in the regressions on food purchases and the share of unhealthy food product purchases over total food purchases, I further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.



(a) Male partner remains in the household



(b) Female partner remains in the household

Figure A12: Trend in outcome variables around separation, by sex of the spouse who remains in the household.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The upper panels present results for households where the remaining spouse is male, while the lower panels show results for households where the remaining spouse is female. The dependent variable are the logarithm of income, food quantities purchased, remaining spouse's BMI, and the share of unhealthy food products purchased in household i in year t. Besides household and year fixed effects and household size, all regressions include dummies for both spouse's age and both spouse's labor market status. The regressions on BMI include in addition the average number of meals eaten at home in a typical week and the regressions on food purchases and the share of unhealthy food product purchases over total food purchases further include total household calorie needs. The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

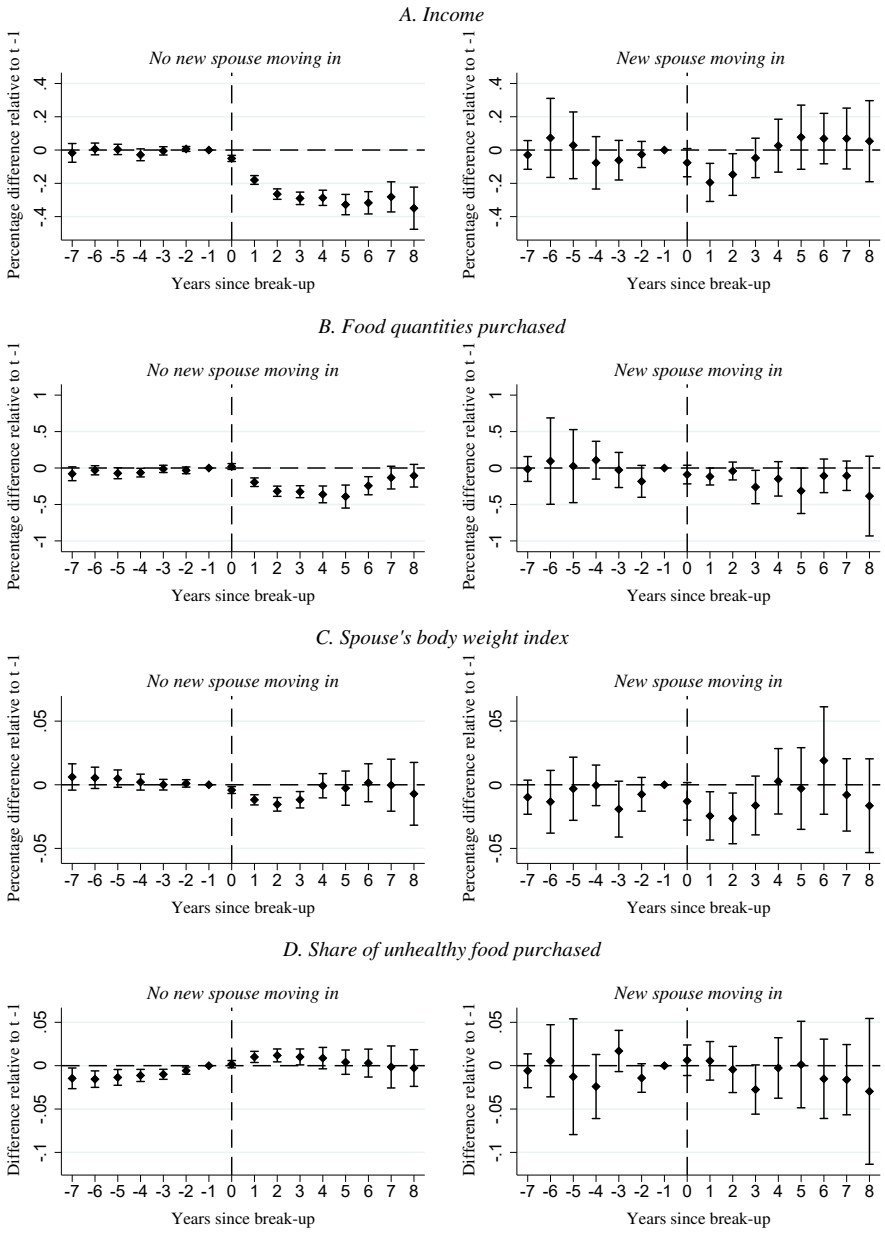


Figure A13: Trend in outcome variables around separation, by subsequent relationship status of the spouse who remains in the household.

Note: The figure shows event time coefficients relative to the control group of households where no separation occurs and relative to the year just before separation ($j = -1$). The left-hand panels present results for households where the remaining spouse stays single, while the right-hand panels show results for households that form a new couple. The dependent variable are the logarithm of income, food quantities purchased, remaining spouse's BMI, and the share of unhealthy food products purchased in household i in year t. The controls include household and year fixed effects, spouse's age and labor market status and household size (to adjust for changes in household size besides separation). The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.

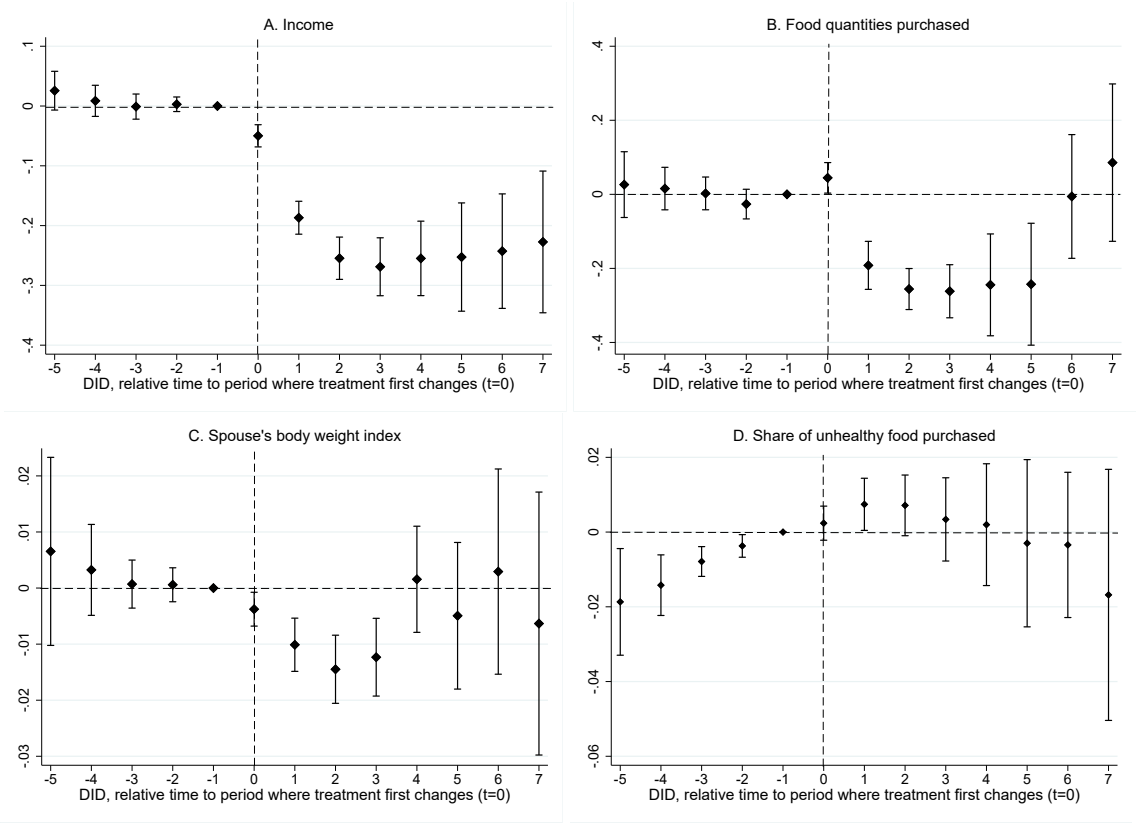


Figure A14: Trend in outcome variables around separation, by subsequent relationship status of the spouse who remains in the household.

Note: The figure shows coefficients from using the approach proposed by De Chaisemartin and d'Haultfoeuille [2020] for estimates that are robust to unobserved effect heterogeneity (using the *did_multiplegt* package). The approach relies on using not-yet-treated units and the parallel trends assumption to recover estimates of the treatment effects for each treated unit type, which can then be averaged together. The dependent variable are the logarithm of income, food quantities purchased, remaining spouse's BMI, and the share of unhealthy food products purchased in household i in year t. The controls include household and year fixed effects, spouse's age and labor market status and household size (to adjust for changes in household size besides separation). The data cover the period from 2005 to 2015. The 95% confidence intervals are based on standard errors clustered at the level of the household.