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Grandparental support and maternal depression: Do grandparents' characteristics matter more for separating mothers?

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Grandparental support may protect mothers from depression, particularly mothers who separate and enter single parenthood. Using longitudinal Finnish register data on 116,917 separating and 371,703 non-separating mothers with young children, we examined differences in mothers' antidepressant purchases by grandparental characteristics related to provision of support. Grandparents' younger age (<70 years), employment, and lack of severe health problems predicted a lower probability of maternal depression. Depression was also less common if grandparents lived close to the mother and if the maternal grandparents' union was intact. Differences in maternal depression by grandparental characteristics were larger among separating than among non-separating mothers, particularly during the years before separation. Overall, maternal grandmothers' characteristics appeared to matter most, while the role of paternal grandparents was smaller. The findings suggest that grandparental characteristics associated with increased potential for providing support and decreased need of receiving support predict a lower likelihood of maternal depression, particularly among separating mothers.

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Introduction

Grandparents are an important source of support to families with children, and young children today are increasingly likely to have living grandparents (Attias-Donfut et al. 2005; Gray 2005; Buchanan and Rotkirch 2018; Rutigliano 2020). However, the availability of support from grandparents is likely to depend on the grandparents' own life situation. Across Europe, grandparents' younger age, non-employment, good health, geographical proximity, and union stability have been shown to predict an increased amount of support given to adult children and grandchildren (Hank and Buber 2008; Aassve et al. 2012). This support might be of particular

importance to mothers' well-being, as mothers tend to bear greater responsibility for childcare than fathers (Craig and Mullan 2011; Sullivan et al. 2018) and also experience larger penalties in earnings and employment from having children (Kleven et al. 2019; Sieppi and Pehkonen 2019). While it is well known that support from others protects individuals from depression (Gariépy et al. 2016), no population-level studies have investigated whether and how grandparental support is associated with depression among mothers. This paper fills this research gap and responds to calls to identify the interactions between family dynamics and mental health outcomes (Keenan and Grundy 2019).

Grandparental support might be particularly relevant for the mental health of separating mothers, most of whom enter single parenthood (defined as the mother continuing to live with her child(ren) without having a new co-residential partner). The adverse mental health effects of separation may be most pronounced among parents of young children (Raley and Sweeney 2020), and those entering single parenthood experience a larger and more persistent increase in depression than mothers who do not live with their child(ren) after separation (Kühn et al. 2023). Although shared custody is increasingly common, joint physical custody is still rare in both Europe and the US (Steinbach et al. 2021). Most children continue to reside with their mother after parental separation, hence even in gender-egalitarian countries such as Finland, more than 80 per cent of single-parent families are headed by women (Official Statistics of Finland 2019). Single mothers often rely on relatives to cope with the challenges of single parenthood (Taylor and Conger 2017; Radey and McWey 2019) and, compared with partnered mothers, they receive more support from grandparents (Dunifon et al. 2018; Cooney 2021). Grandparental characteristics that predict the availability of support might thus explain how differences in mothers' mental health emerge and change around the time of separation and following entry into single parenthood. The lack of previous studies on the topic is surprising, given the consistently observed overall mental health disadvantage among single mothers (Crosier et al. 2007; Cooper et al. 2008) as well as the well-established adverse effects of poor maternal mental health on children's well-being (Trussell et al. 2018; Pierce et al. 2020).

In this paper we use Finnish register data to examine whether there are differences in maternal depression by grandparents' characteristics, whether the differences are more pronounced among separating than non-separating mothers, and how they change around the time of separation. We make several contributions to previous literature. First, following calls to pay more attention to different social locations and multiple levels of social support when investigating parental well-being (Nomaguchi and Milkie 2020), we enhance understanding of how the potential availability of grandparental support affects mothers' mental health. Second, by analysing *all* grandparents, both from the mother's side and the child's father's side, we are able to test theoretical hypotheses related to the potential mental health consequences of matrilineal bias in grandparenting: that is, to what

extent the (on average) larger investments from maternal than paternal grandmothers might improve not only the lives of their grandchildren but also the lives of the mothers of those children (Daly and Perry 2017). Third, our examination of the depression trajectories of separating mothers by grandparents' characteristics contributes to knowledge on how the broader social and kin context in which adverse life-course events occur may moderate their consequences for mental health (Raley and Sweeney 2020). Finally, our findings increase knowledge on how larger societal changes—such as postponement of childbearing, increasing partnership instability, and changes in intergenerational proximity in European countries (Chan and Ermisch 2015; Bernardi et al. 2018; Steinbach et al. 2019; Beaujouan 2020; Kalmijn 2021)—may affect maternal mental health now and in future.

Our study, with its focus on the Nordic context, is also highly relevant from the policy perspective. Nordic countries have a long history of pro-egalitarian policies, with universal access to health and social services, including affordable early-childhood education and care for families with children, low-cost healthcare services, and sheltered housing for older people. Given that in many countries governments are ambitious to improve the availability of formal childcare in order to raise parental employment and increase gender equality, it is paramount to understand whether grandparental characteristics still matter for mothers' mental health in institutional contexts (such as Finland) where such policies are already in place.

Background

The demographic changes of recent decades—increased life expectancy, lower completed fertility, and smaller age gaps between siblings—coupled with the relatively early childbearing of the 1970s have increased the chances of young children having several living grandparents (Attias-Donfut et al. 2005; Gray 2005). Grandparents often support their grandchildren's families (Albertini et al. 2007; Hank and Buber 2008), and while this support may have beneficial effects on mothers' mental health, the overall scarce evidence provided by previous research is mixed. This may be partly because prior research has focused either on multi-generational co-residence or on a particular subgroup, such as teen mothers or mothers of disabled children, thus excluding the majority of mothers (Kalil et al. 1998; Greenfield 2011; Piontak 2016).

While grandparental support seems beneficial for the well-being of parents with disabled children (Green 2001; Crettenden et al. 2018), the findings on the benefits of co-residence are mixed and seem to depend on duration of co-residence (Kalil et al. 1998; Greenfield 2011; Piontak 2016).

Growing family instability may be increasing the importance of multigenerational ties further in contemporary societies (Bengtson 2001; Dunifon 2013; Buchanan and Rotkirch 2018). Compared with partnered mothers, single mothers display higher prevalence of depressive symptoms (Crosier et al. 2007; Cooper et al. 2008), psychological distress (Franz et al. 2003), and anxiety disorders (Afifi et al. 2006), alongside lower levels of well-being (Bull and Mittelmark 2009; Kühn 2018); most scholars attribute this to their chronic economic strains and sole-parenting responsibilities (Crosier et al. 2007; Dziak et al. 2010). For women, separation is the main pathway into single parenthood (Bernardi and Larenza 2018; Kühn et al. 2023), and a large body of research has documented the negative association between separation and mental health, showing that the period of highest psychological distress and depression occurs mainly during the separation, followed by weaker effects in the long term (see Raley and Sweeney 2020 for a review). Parenting responsibilities and problems may increase vulnerability to the negative consequences of separation (Williams and Dunne-Bryant 2006), as they can affect employment and housing opportunities, increase distress due to financial strain, cause conflict over custodial arrangements, and prevent remarriage (Liu and Chen 2006).

The Conservation of Resources theory

Depression among mothers, and the way it may be moderated by the potential availability of support from others or by the need to provide support to others, can be understood from the perspective of Conservation of Resources (COR) theory (Hobfoll 2001). Resources may be broadly defined as material assets and also non-material entities that people value, such as time spent with family or emotional support (Hobfoll 2002). COR theory emphasizes the human motivation to protect against resource loss and to gain resources, for example by maintaining and developing relationships with grandparents from both the maternal and paternal sides. Although intergenerational support flows mainly downwards from grandparents to adult children and grandchildren, at times grandparents may need support

themselves (Bengtson 2001; Grundy 2005; Greenfield 2011). This may lead to upward care: that is, the parents need to care for their own parents instead of the grandparents providing care downwards (Grundy 2005; Margolis and Wright 2017). Thus, depending on their characteristics, grandparents may be a source of either resource gains or potential resource losses.

According to COR theory, adverse life-course events, such as separation, result in stress and strain, not only due to the event itself but also from the resource losses associated with the event (Hobfoll 2001). In line with COR theory, single mothers' poor mental health would seem to result mainly from the losses of material and social resources (Crosier et al. 2007; Dziak et al. 2010). Yet, these adverse effects of resource loss, or the threat of resource loss, may be balanced by received or expected resource gains (Hobfoll 2001). Indeed, there is evidence that grandparents provide more support to adult children who are single parents or going through separation than to their partnered children (Dunifon et al. 2018; Cooney 2021; Min et al. 2022). Among separating mothers, the availability of grandparental support might thus play a protective role against resource losses, whereas grandparents who need support themselves might further exacerbate the effects of these losses. However, as COR theory posits that the psychological harm to individuals from losing resources outweighs the benefit of gaining otherwise similar resources, we can expect potential support from grandparents to compensate only partially for the resource losses that tend to follow separation.

Grandparental characteristics and availability of support

The availability of support from grandparents depends on their life situation and characteristics. In a European study, grandparents aged in their 50s and 60s were most likely to provide childcare and other time-intensive help (Attias-Donfut et al. 2005). Age is closely intertwined with both employment and health among grandparents. Although less likely to suffer from health problems, younger grandparents are often still employed and thus less available for childcare (Rutigliano 2020). However, a survey conducted in 10 European countries showed that although working grandparents were less likely to provide regular childcare, their employment status was unrelated to their probability of providing occasional care (Hank and Buber 2008;

Aassve et al. 2012). Employed grandparents may also have greater material resources compared with non-employed grandparents, suggesting that they could be more likely to give material support. Previous studies largely agree that poor health decreases grandparental support (Aassve et al. 2012; Thomese and Liefbroer 2013), and even if unhealthy grandparents offer their support, parents may not consider their care reliable (Aassve et al. 2012). Across European countries, limitations with activities of daily living have been shown to predict a lower probability of providing childcare to grandchildren (Hank and Buber 2008). Furthermore, old and frail grandparents may need support themselves, leading to parents giving support upwards instead of receiving support (Grundy 2005; Margolis and Wright 2017). Even if grandparents are in good health and willing to provide support, geographical distance may limit their availability to provide childcare (Rainer and Siedler 2012). In a survey in 10 European countries, the frequency of contact and likelihood of childcare decreased with increasing geographical distance between the parental and grandparental generations, particularly for regular childcare (Hank 2007; Hank and Buber 2008).

The matrilineal bias in grandparenting

Previous studies have consistently shown that a matrilineal bias exists in grandparenting: maternal grandparents are more likely to provide support and to be involved in the lives of grandchildren than paternal grandparents, and grandmothers are more active than grandfathers (Attias-Donfut et al. 2005; Hank and Buber 2008; Daly and Perry 2017; Perry and Daly 2017). Also, in Western societies, women are usually more involved in maintaining social ties and fostering family solidarity than men, which makes intergenerational support more likely to follow the matrilineal pattern (Bucx et al. 2012; Albertini and Tosi 2018). Evolutionary theories also suggest that maternal grandmothers take the greatest interest in caring for grandchildren, because they can be certain of sharing lineage with them and because supporting them is expected to benefit their own daughter, who may then invest more on her natal relatives (Daly and Perry 2017; Perry and Daly 2017). Whereas married grandfathers have less contact with their adult children overall than grandmothers, after divorce these sex differences increase further (Kalmijn 2007). A grandmother's partnership status is either not at all or only weakly associated with her probability of

providing support to adult children and grandchildren, but non-partnered grandfathers are less likely to be involved than grandfathers living with a partner (Hank and Buber 2008; Danielsbacka and Tanskanen 2018).

Parental separation and matrilineal bias

Grandparents' involvement with children is already largely established before parents separate, suggesting that grandparents who were already strongly involved before the separation will continue to be so, whereas disengaged grandparents may become even more disengaged (Douglas and Ferguson 2003). Because grandparents provide more support to adult children who are single parents, children living with a single mother may even have a higher level of contact with maternal grandparents than children living with both parents (Westphal et al. 2015; Jappens and Bavel 2016). Furthermore, parents usually facilitate contact between grandparents and grandchildren, and after parental separation children's residential arrangements support the preservation of grandparental relationships in one lineage and help the custodial parent to control access to the other lineage (Albertini and Tosi 2018). Even though separating parents are increasingly opting for shared custody, in Finland, as in most other European countries and the US, the proportion of parents who equally share physical custody is still low (Steinbach et al. 2021). The fact that most children continue to reside with their mothers after separation (Kühn et al. 2023) is thus expected to accentuate the matrilineal bias in intergenerational contacts and to lower the probability of support from paternal grandparents (Harknett and Knab 2007; Albertini and Tosi 2018).

The present study

In this paper, we examine whether there are differences in maternal depression by grandparents' characteristics, whether these differences are more pronounced among separating than non-separating mothers, and whether and how grandparents' characteristics moderate depression trajectories around the time of separation. Because mothers' needs for support are larger when children are young and need care, our analyses focus on mothers living with children aged 12 or under (Hank and Buber 2008; Thomese and Liefbroer 2013; Raley and Sweeney 2020). As childbearing outside marriage is

increasingly common, we include both non-marital and marital unions and separations.

We measure depression by antidepressant purchases and examine whether mothers' likelihood of depression depends on the age, employment, health, geographical proximity, and union stability of their youngest child's maternal and paternal grandparents. Guided by COR theory, we view characteristics that are related to increased availability of support from grandparents—younger age, geographical proximity, and union stability—as potential sources of resource gains for the mothers. In contrast, characteristics that are related to grandparents' higher probability of needing support—old age and poor health—are seen as potential sources of resource losses. We expect that more advantaged grandparental characteristics will be related to a lower probability of maternal depression, whereas less advantaged characteristics will be related to a higher probability of maternal depression (Hypothesis 1). Further, because there is a matrilineal bias in grandparental support, we assume that maternal depression will be more strongly associated with the characteristics of maternal than paternal grandparents (Hypothesis 2).

To assess how differences in depression by grandparents' characteristics develop during the pre-separation period of conflict and uncertainty, as well as during the early years of single parenthood, we follow the separating mothers for four years before and four years after separation. COR theory suggests that the stresses and strains related to separation result mainly from associated resource losses and that these losses may be to some extent balanced by resource gains. Thus, we expect the potential availability of grandparental support to alleviate the adverse mental health effects of separation and single parenthood (Hypothesis 3). Because the matrilineal bias in grandparenting is assumed to increase following parental separation, we expect that differences in maternal depression by maternal grandparents' characteristics will further increase over time since separation, whereas differences by paternal grandparents' (ex-parents-in-law) characteristics will decrease over time (Hypothesis 4).

Data and methods

Sample

We used Finnish-register-based total population data on all mothers born in Finland between 1945 and 1995 who had children aged 12 or under. Our data set consisted of mothers who could be followed for

at least three years during 2000–14 and who were either: (1) living continuously with their biological child and that child's father without experiencing union dissolution (referred to as *non-separating mothers*); or (2) separated (by divorce or end of non-marital cohabitation, excluding by bereavement) from their biological child's father during 2000–14 and continuing to live with their child after the separation (referred to as *separating mothers*). The data contained information on all children, their biological parents, and their maternal and paternal grandparents, based on personal identification codes. We included only Finnish-born mothers (85.6 per cent of separating; 94.5 per cent of non-separating mothers), because information on grandparents was frequently missing for foreign-born mothers. No linkages could be made to biological relatives who had died before 1968, the year by which all permanent residents of Finland had received their personal identification codes. We included in our sample all mothers who could be linked to at least one maternal or paternal grandparent of their youngest child (99.6 per cent of separating; 99.8 per cent of non-separating mothers). After all exclusions, our final sample included 116,917 separating and 371,703 non-separating mothers.

For all sample members, annual socio-demographic and family information, including exact dates of separation from marriages and non-marital cohabiting unions, was available from Statistics Finland. These data had been linked to information on medication purchases in the Finnish Prescription Register maintained by the Social Insurance Institution and to information on inpatient and specialized outpatient hospital care in the Care Register maintained by the Finnish Institute for Health and Welfare. These good-quality registers benefit from practically complete national coverage (Sund et al. 2014) and enabled the assessment of depression with minimal sample selection bias or loss to follow-up, which can be critical problems in survey-based studies. The data linkage was carried out by Statistics Finland (by permission TK-53-1121-18 of the Ethics Committee of Statistics Finland). The use of Finnish register data for purposes of scientific research carried out in the public interest does not require informed consent from participants. All data were available from 1995 to 2017.

Non-separating mothers included all mothers who had lived with their youngest biological child and that child's biological father for at least three years during 2000–14 and for whom a union dissolution had not been observed before the child reached

their 13th birthday. Separating mothers included all mothers who had lived with their child in the year following parental separation. These women represented the vast majority of separating mothers (84.7 per cent). In the case of multi-partner fertility, we defined separation as separation from the youngest child's father. For marital dissolutions, the date of separation was usually before the date of formal divorce, because of a mandatory consideration period of at least six months. However, where the formal divorce occurred first, we recorded that as the date of separation.

Outcome variable

Maternal depression was measured with antidepressant (hereinafter AD) purchases (Anatomical Therapeutic Chemical (ATC) code N06A). In Finland, all ADs are prescribed by clinical doctors, and all permanent residents are entitled to reimbursement for medication expenses, usually provided directly at the pharmacy (Sihvo et al. 2008). The prescription register includes information on the date of purchase and type of medication. Finland is a Nordic welfare state with universal healthcare, and general practitioners in primary care commonly offer ADs to patients seeking help for depressive symptoms (Sihvo et al. 2008; Vuorilehto et al. 2016). The probability of using ADs is predicted mainly by the severity, duration, and perceived disability associated with depression and not by education, income, employment status, or living arrangements (Hämäläinen et al. 2004, 2009). We thus expect differences in AD use to reflect underlying differences in depression accurately, although the observed level of AD use is likely to underestimate the prevalence of milder depressive symptoms. The relevance of studying differences in AD use is further highlighted by their use strongly predicting other severe adverse outcomes, such as disability retirement and mortality (Laaksonen et al. 2012; Moustgaard et al. 2013).

Grandparents' characteristics

Mothers were linked to their youngest child's biological grandparents: that is, their own mother and father as well as their (ex-)mother-in-law and (ex-)father-in-law. We refer here to mothers' own parents as maternal grandparents and to (ex-)parents-in-law as paternal grandparents. For each grandparent, we measured their age, employment status, health status, distance from the

mother, and living arrangements. Grandparents' characteristics were measured at the year of separation or, for non-separating mothers, during the randomly assigned year of reference (see Statistical analyses subsection). Age was classified as '<70 years' vs '70+ years'. Employed grandparents were separated from all other grandparents ('employed'; 'non-employed'). Grandparents' health ('has a chronic health condition'; 'does not have a chronic health condition') was measured using information on hospital-level care and medication purchases related to chronic conditions, including dementia, stroke, Parkinson's disease, and hip fracture. These conditions are associated with functional capacity and are also known to predict entry into institutional care (Nihtilä et al. 2008). Distance between each grandparent and the mother was measured using postal area codes, with less than 10 km classified as 'close'. Finally, we assessed whether the grandparents were living together or not. Although their living arrangements are not expected to affect the availability of support from the grandmother, support from the grandfather may be weaker if the grandparents are no longer living together (Kalmijn 2007; Danielsbacka and Tanskanen 2012) and the overall level of support may thus be lower. With their own union intact, grandparents are also less likely to need support from their children.

Control variables

We adjusted our analyses for several maternal socio-demographic characteristics, to take into account that these characteristics may be associated with grandparents' characteristics and also with mothers' probabilities of depression and separation. For example, if grandparents are older, the mother is also likely to be older, which is relevant as the probability of AD use also changes with age. We measured the mother's age and also her educational level, classified as 'tertiary', 'secondary', or 'basic' based on highest educational qualification. The mother's disposable income was classified into quintiles annually. Disposable income included earned income and money transfers received after taxes and tax-deductible expenses but not child support, which is non-taxable and hence data on this dimension of income are not available in registers. Employment status ('employed'; 'unemployed'; 'other') was recorded based on the mother's main activity in the last week of the year. Area of residence referred to the mother's home municipality at the end of the year and was classified as 'urban', 'semi-urban', or

‘rural’. To take into account the family’s need of support, we recorded how many children aged <18 the mother had, classified as ‘one’ or ‘two or more’. We also recorded the age of the youngest child. In Finland, all children enter mandatory preschool at age six, and we thus classified the age of the youngest child as ‘five years or under’ vs ‘six to 12 years’.

The register data contained no information on how often the children visited their fathers after separation. However, we approximated the father’s involvement by measuring how close the parents lived to each other, as geographical distance has been shown to predict the level of contact between children and their non-resident fathers (McKenry et al. 1992; Leite and McKenry 2002; Westphal et al. 2014). We calculated the geographical distance between the postal areas of the mother and father and classified a distance of less than 10 km as ‘close’. In addition to the child’s biological father, the mother’s new partner is a potential source of support. To identify new partners, we used annual information on both marital status and non-marital cohabitation. Statistics Finland defines cohabiting partners as spouseless adults of different sexes living in the same dwelling on a permanent basis, provided that they are not siblings and their age difference does not exceed 15 years, a definition which results in quite a similar prevalence of non-marital cohabiting unions to that found from survey samples in Finland (Metsä-Simola and Martikainen 2014).

Statistical analyses

We investigated differences in maternal depression by modelling how grandparents’ characteristics predicted mothers’ probability of making at least one AD purchase within a year: herein referred to as AD use. First, we examined whether differences in AD use by grandparents’ characteristics were more pronounced among separating than non-separating mothers. For separating mothers, we measured whether at least one AD purchase had been made during the year immediately after their date of separation. For each non-separating mother, we generated a random date between the years 2000 and 2014 (given the limitation that their youngest child had to have been born but not yet reached their 13th birthday) and measured whether they had made at least one AD purchase during the year immediately after this random date (see e.g. Einiö et al. 2023 for using random dates to create a comparison group

of non-divorcing women). Second, we investigated how differences in AD use developed before separation and during the first years of single parenthood. Drawing on previous research showing that depressive symptoms start to emerge during the pre-separation period of marital conflict and persist during the years immediately after separation (Metsä-Simola and Martikainen 2013, 2014; Raley and Sweeney 2020; Kühn et al. 2023), we followed the separating mothers four years before and four years after separation. To take into account that some separating mothers did not have children at the beginning of the four-year pre-separation period, follow-up was left-truncated to begin at the year of the child’s birth (or when the parents started living together). Mothers whose youngest child reached age 12 during the four-year post-separation period were censored in the year of the child’s 13th birthday.

We modelled mothers’ annual AD use by grandparents’ characteristics using logistic panel regression, with general estimating equations to control for within-individual correlations (Twisk 2013). Grandparents’ characteristics were measured at the year of separation/reference and assumed to be quite stable during the follow-up period. Population-averaged models, although not strictly causal, are suitable for estimating differences between population subgroups by variables that vary little over time and for which fixed-effects methods are thus not an optimal choice. Here we present estimates of predicted probabilities from models that separately examine the role of each characteristic of each grandparent to mothers’ AD use.

All models were adjusted for calendar year (categorical variable), to account for the overall increase in AD use, and adjusted for the mothers’ own and household characteristics, which were all time-varying covariates. To take into account that the association between separation and maternal depression may vary according to children’s ages, an interaction between the youngest child’s age and follow-up time was added to all models.

We also performed two supplementary robustness checks. First, because a grandparent’s characteristics—age, employment, and health in particular—are intertwined, we estimated models that included information on all the measured characteristics of one grandparent simultaneously. Second, to capture other symptoms of poor mental health in addition to depression, we repeated our main analyses using a broader measure of mental health problems, which included purchases of anxiolytics,

hypnotics, and sedatives (ATC codes N05B and N05C) as well as ADs. Medications in these categories are commonly used to treat symptoms of anxiety, insomnia, and related mental health conditions, and among Finnish women, their use has been shown to increase at the time of divorce, although less than AD purchases (Metsä-Simola and Martikainen 2013). We refer to purchases of ADs, anxiolytics, hypnotics, and sedatives as ‘psychotropic medication use’.

Results

Among all mothers, AD use was more common among those with a parent or parent-in-law who was older, non-employed, or in poor health (Table 1). Mothers not living close to their own parent(s) or parent(s)-in-law also showed higher AD use than other mothers, as did mothers whose own parents were not living together. These differences in mothers’ AD use by grandparents’ characteristics were somewhat larger among separating than non-separating mothers. AD use was overall much more common among separating than non-separating mothers (15.7 per cent vs 6.9 per cent; Table A1, supplementary material), and the socio-demographic profiles of these two groups were somewhat different (see Text A1, supplementary material, for a more detailed description).

Of the living grandparents, most were aged <70, but less than 30 per cent of non-separating mothers had own parents or parents-in-law who were still employed, the proportions being somewhat higher among separating mothers (Table 1). Chronic health conditions (e.g. dementia, stroke, Parkinson’s disease, hip fracture) were rather uncommon among grandparents, their prevalence ranging from 5.9 per cent among separating mothers’ own mothers to 10.4 per cent among non-separating mothers’ fathers-in-law. Compared with separating mothers, a smaller proportion of non-separating mothers lived close to their own parent(s), but a higher proportion lived close to their parent(s)-in-law. Separating mothers more often had parents and parents-in-law who were not living together (i.e. the grandparents were separated, widowed, or had never lived together).

For the non-separating mothers, there were no differences in AD use by the age of their child’s maternal and paternal grandparents after accounting for mothers’ own socio-demographic characteristics (Figure 1). Among all separating mothers, AD use clearly increased before separation, but it was

already higher than among non-separating mothers four years before separation. During the four-year pre-separation period those whose own mother or father was aged 70+ clearly displayed higher AD use compared with those whose own parent was younger, the difference ranging from 1.3 to 1.8 percentage points by own mother’s age and from 1.0 to 1.3 percentage points by own father’s age. During the first year after the exact date of separation, AD use was slightly higher than during the year immediately preceding separation, whereas it was considerably larger compared with two years before separation. However, differences in AD use by own parents’ age were no longer evident shortly after separation.

Between four and two years before separation, mothers whose mother-in-law was older showed 1.0–1.6-percentage-point-higher AD use than separating mothers with a younger mother-in-law, but three years after separation this association had reversed so that AD use was slightly lower among mothers whose ex-mother-in-law was older than those whose ex-mother-in-law was younger. Closer to the separation, AD use was similar, irrespective of the (ex-)mother-in-law’s age. The association between (ex-)father-in-law’s age and mothers’ AD use was similar in shape, but the difference in AD use before separation was smaller.

Among non-separating mothers, differences in AD use by own parent or parent-in-law being employed or not were small to minimal (Figure 2). The largest difference was observed by own mother’s employment, with non-separating mothers whose own mother was employed exhibiting 0.5-percentage-point-lower AD use than other non-separating mothers. In contrast, separating mothers whose own mother was employed already showed 2.0-percentage-point-lower AD use four years before separation than other separating mothers, whereas own father’s employment was associated with 1.7-percentage-point-, mother-in-law’s employment with 1.7-percentage-point-, and father-in-law’s employment with 1.4-percentage-point-lower AD use. All these differences diminished over time, but four years after separation, mothers whose own mother was employed still displayed 0.7-percentage-point-lower AD use than other separating mothers. At that time, mothers’ AD use was already similar, irrespective of own father’s employment. Differences in AD use by employment of parents-in-law had disappeared earlier, meaning that at the time of separation mothers’ AD use was similar, regardless of ex-mother-in-law’s or ex-father-in-law’s employment. In models that

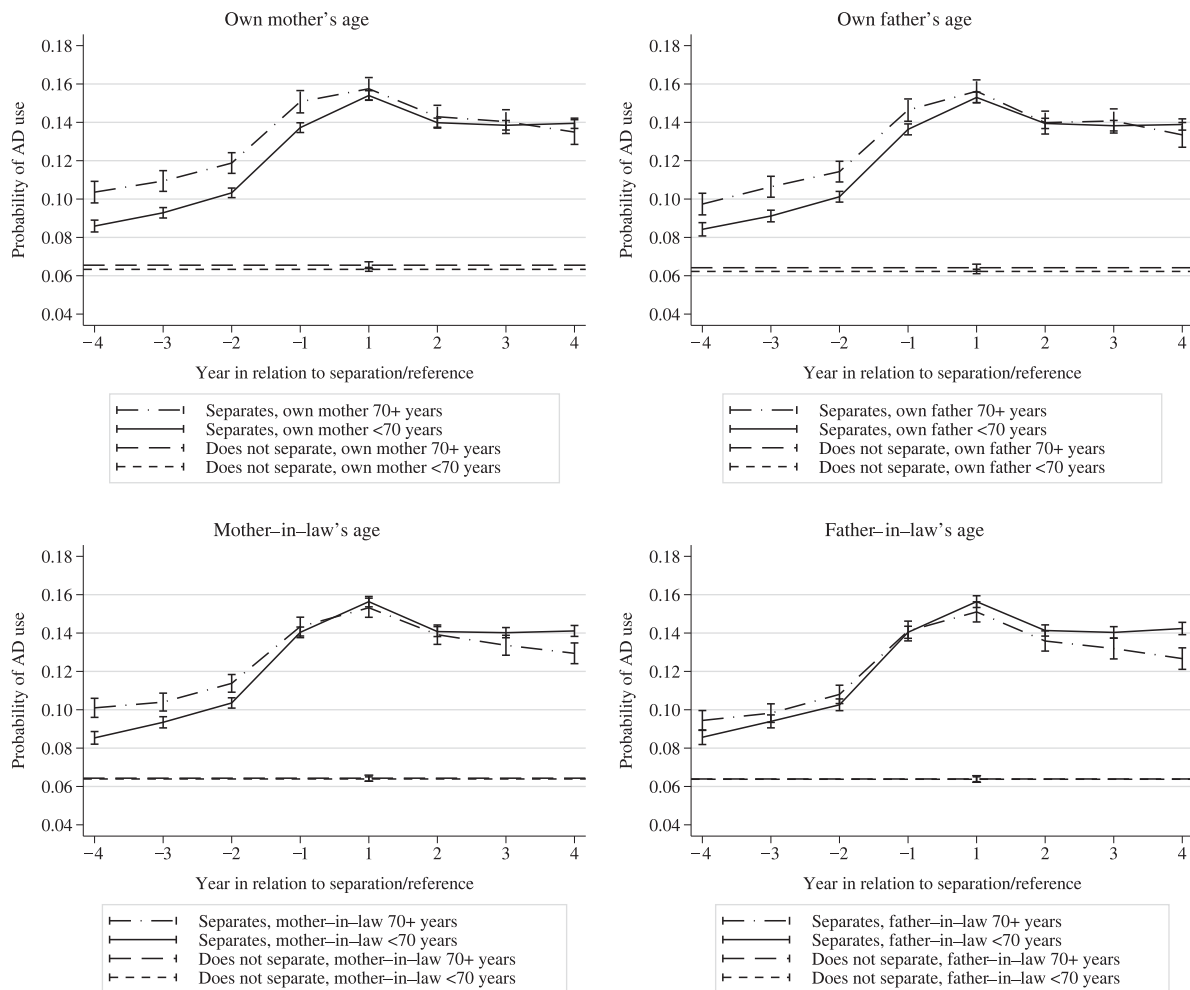


Figure 1 Separating and non-separating mothers' antidepressant use by grandparents' age: Finnish mothers born 1945–95

Notes: For separating mothers, year 1 refers to the first year immediately after the date of separation, and year –1 refers to the year immediately before the date of separation. For non-separating mothers, year 1 is the reference year (see Data and methods section). All models are adjusted for calendar year; for the mother's age, socio-economic and family characteristics, and area of residence; and for an interaction between the youngest child's age and follow-up time. Vertical bars indicate 95 per cent confidence intervals.

Source: Authors' analysis based on register data from Statistics Finland and the Social Insurance Institution.

simultaneously adjusted for grandparents' age and employment, the associations between employment and mothers' AD use remained almost unchanged (Figures A3–A6, supplementary material). Thus the associations between grandparents' employment and separating mothers' AD use do not result only from employed grandparents being younger than other grandparents.

Own mother's and own father's poor health were strongly related to both separating and non-separating mothers' AD use (Figure 3). Compared with other non-separating mothers, those whose own mother or father had a chronic health condition showed 0.7-percentage-point-higher AD use. Separating mothers whose own parent had a chronic health condition

also exhibited higher AD use than other mothers, both before and after separation. The differences seemed somewhat larger than the differences among non-separating mothers, but confidence intervals were quite wide. Neither the (ex-)mother-in-law's nor the (ex-)father-in-law's chronic health conditions were related to mothers' AD use. The results were quite similar in models that simultaneously adjusted for all grandparental characteristics (Figures A3–A6, supplementary material).

Living close to grandparents was clearly associated with mothers' lower AD use (Figure 4). Among non-separating mothers, living close to own mother or father was associated with 0.3–0.4-percentage-point-lower AD use compared with not living

Table 1 Separating and non-separating mothers' antidepressant use by living grandparents' characteristics: Finnish mothers born 1945–95, with at least one grandparent of their youngest child known

	<i>Type of grandparent (relationship to mother)</i>							
	Own mother		Own father		Mother-in-law		Father-in-law	
	Distribution (percentage)	AD use (percentage)	Distribution (percentage)	AD use (percentage)	Distribution (percentage)	AD use (percentage)	Distribution (percentage)	AD use (percentage)
(a) Separating mothers	100.0	15.5	100.0	15.4	100.0	15.6	100.0	15.5
<i>Grandparents' characteristics</i>								
Age (percentage)								
<70 years	86.3	15.1	83.9	15.0	65.5	15.3	78.2	15.2
70+ years	13.7	17.9	16.1	17.6	34.5	16.9	21.8	16.6
Employed (percentage)								
Yes	43.8	14.2	39.3	14.0	34.3	14.8	34.0	14.7
No	56.2	16.5	60.7	16.3	65.7	16.1	66.0	15.9
Has a chronic health condition (percentage)								
Yes	5.9	18.6	7.2	18.1	7.0	17.5	8.4	17.0
No	94.1	15.3	92.8	15.2	93.0	15.5	91.6	15.4
Lives close (percentage)								
Yes	45.3	15.1	39.9	14.8	38.6	15.2	36.9	15.1
No	54.7	15.9	60.1	15.8	61.4	15.9	63.1	15.7
Lives with other biological grandparent (percentage)								
Yes	46.4	14.9	55.7	14.9	46.7	15.5	57.9	15.5
No	53.6	16.0	44.3	16.0	53.3	15.7	42.1	15.5
(b) Non-separating mothers	100.0	6.8	100.0	6.7	100.0	6.8	100.0	6.9
<i>Grandparents' characteristics</i>								
Age (percentage)								
<70 years	72.8	6.6	69.2	6.5	80.3	6.6	62.6	6.6
70+ years	27.2	7.5	30.8	7.3	19.7	7.3	37.4	7.3
Employed (percentage)								
Yes	28.4	6.2	25.1	6.3	23.5	6.5	21.2	6.3
No	71.6	7.0	74.9	6.9	76.5	6.9	78.8	7.0
Has a chronic health condition (percentage)								
Yes	7.9	8.0	9.5	7.9	9.0	7.6	10.4	7.6
No	92.1	6.7	90.5	6.6	91.0	6.8	89.6	6.8
Lives close (percentage)								
Yes	37.5	6.6	34.8	6.4	43.1	6.4	42.1	7.2
No	62.5	6.9	65.2	6.9	56.9	7.2	57.9	6.3
Lives with other biological grandparent (percentage)								
Yes	56.2	6.4	69.9	6.4	54.9	6.9	70.1	6.8
No	43.8	7.3	30.1	7.5	45.1	6.8	29.9	7.0

Note: For separating mothers, characteristics and AD use refer to the year of separation; for non-separating mothers, characteristics and AD use refer to the reference year (see Data and methods section).
Source: Authors' analysis based on register data from Statistics Finland, the Social Insurance Institution, and the Finnish Institute for Health and Welfare.

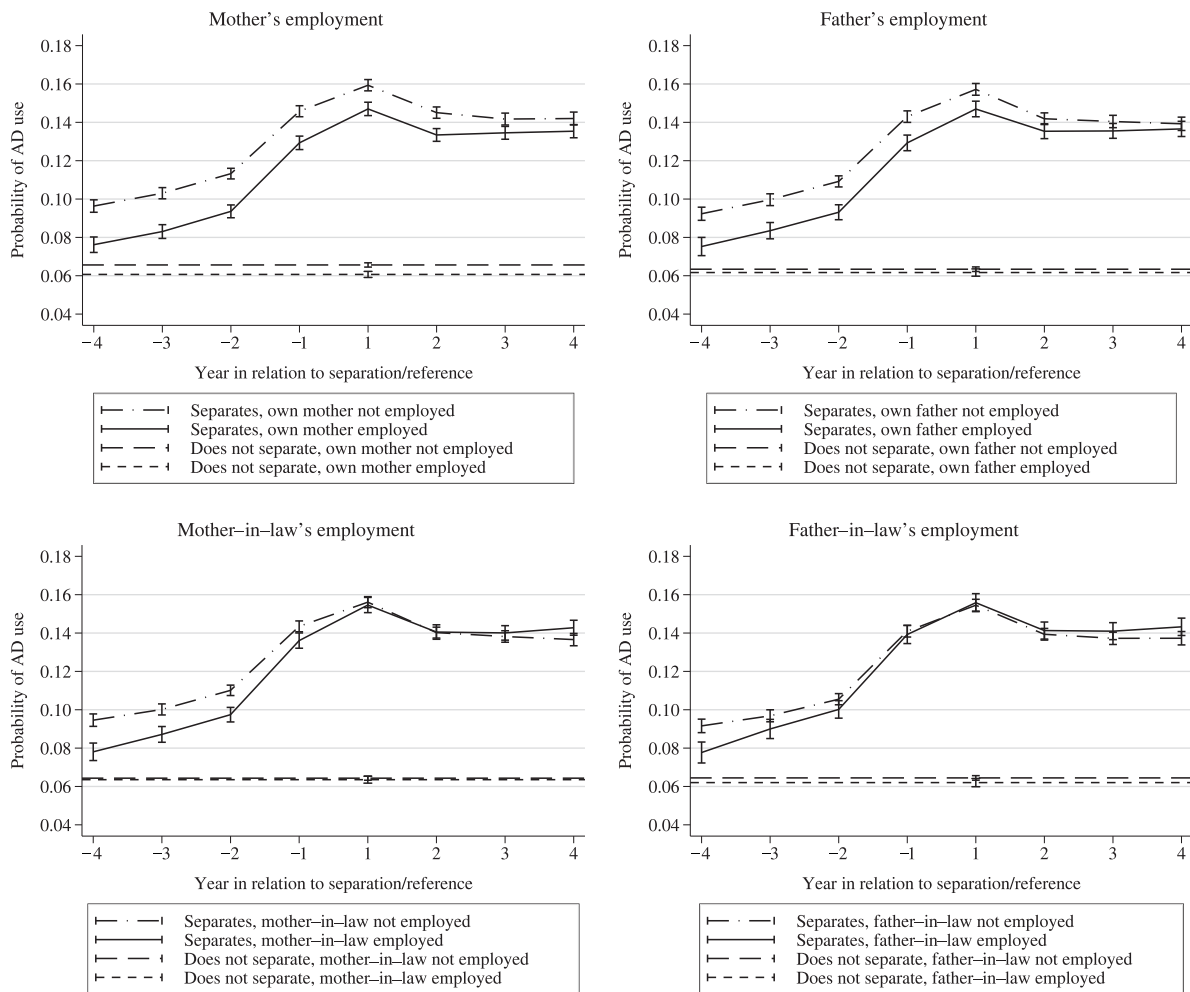


Figure 2 Separating and non-separating mothers' antidepressant use by grandparents' employment: Finnish mothers born 1945–95

Notes: For separating mothers, year 1 refers to the first year immediately after the date of separation, and year –1 refers to the year immediately before the date of separation. For non-separating mothers, year 1 is the reference year (see Data and methods section). All models are adjusted for calendar year; for the mother's age, socio-economic and family characteristics, and area of residence; and for an interaction between the youngest child's age and follow-up time. Vertical bars indicate 95 per cent confidence intervals.

Source: As for Figure 1.

close. Among separating mothers, the difference in AD use by distance to own mother or father was larger, ranging from 0.6 to 1.2 percentage points. In contrast, the difference in mothers' AD use by distance to (ex-)parents-in-law was of similar magnitude among separating and non-separating mothers. For non-separating mothers, AD use was 0.6 percentage points lower among those who lived close to their mother-in-law and 0.8 percentage points lower for those living close to their father-in-law compared with non-separating mothers living further away. Among separating mothers, the difference in AD use peaked during the year before separation, with AD use being 1.2 percentage points lower for those living close to their mother-in-

law and 1.0 percentage points lower for those living close to their father-in-law compared with those not living close. During the year immediately after separation these differences halved and were no longer statistically significant; however, thereafter the differences increased again. The results remained very similar when we estimated models that included all grandparental characteristics simultaneously (Figures A3–A6, supplementary material).

Mothers whose own parents were living together clearly exhibited lower AD use compared with mothers whose own parents were not living together (Figure 5). This difference in AD use was 0.8 percentage points among non-separating mothers, whereas among separating mothers the difference in AD use

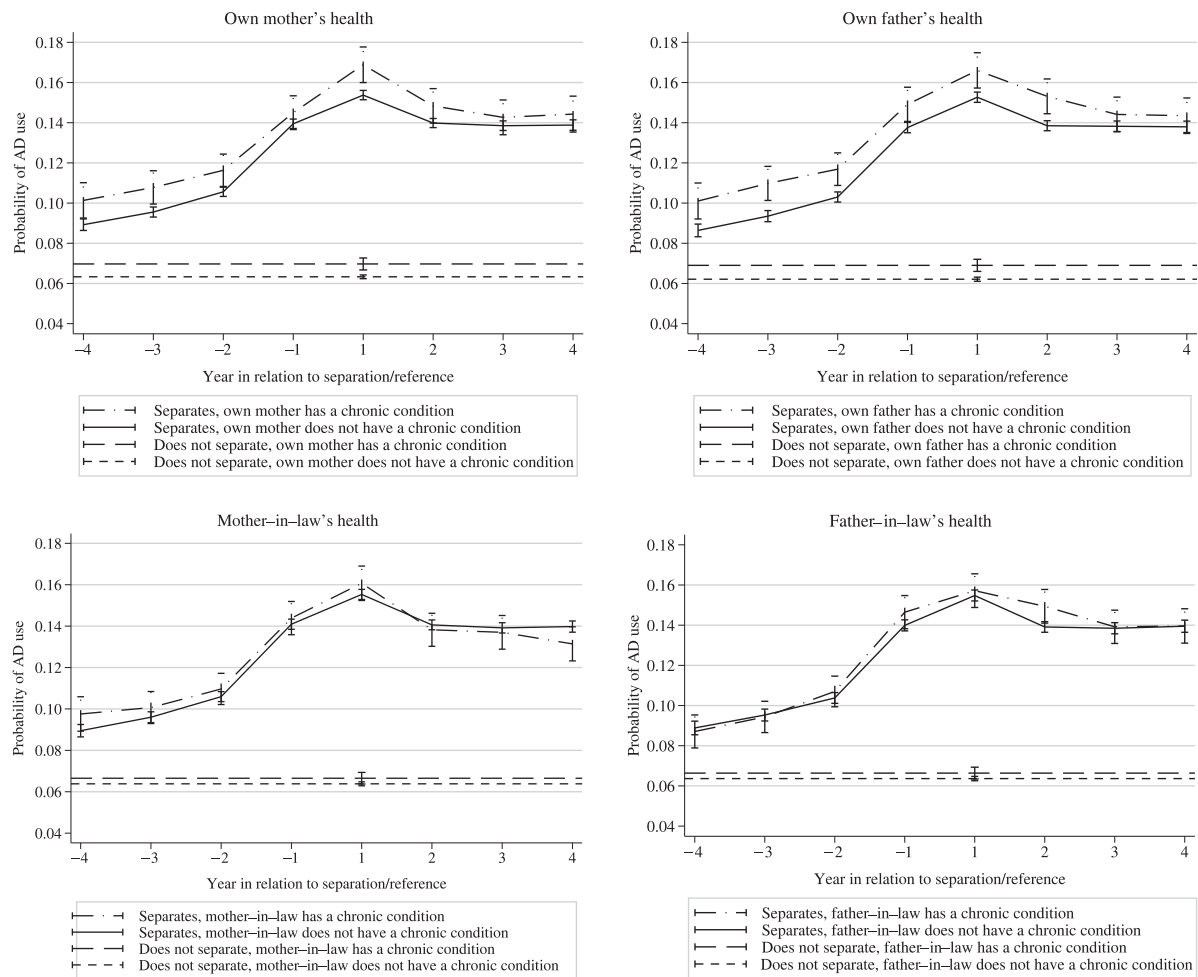


Figure 3 Separating and non-separating mothers' antidepressant use by grandparents' health: Finnish mothers born 1945–95

Notes: For separating mothers, year 1 refers to the first year immediately after the date of separation, and year –1 refers to the year immediately before the date of separation. For non-separating mothers, year 1 is the reference year (see Data and methods section). All models are adjusted for calendar year; for the mother's age, socio-economic and family characteristics, and area of residence; and for an interaction between the youngest child's age and follow-up time. Vertical bars indicate 95 per cent confidence intervals.

Source: Authors' analysis based on register data from Statistics Finland, the Social Insurance Institution, and the Finnish Institute for Health and Welfare.

first declined from 0.7 percentage points four years before separation to 0.4 percentage points immediately before separation, but then started to increase and reached 1.6 percentage points four years after separation. There was no difference in non-separating mothers' AD use by whether their parents-in-law were living together or not. Among separating mothers, AD use was slightly lower before separation if parents-in-law were living together, but the difference disappeared at the time of separation and was not observed thereafter.

Trajectories of mothers' psychotropic medication use by grandparents' characteristics (Figures A7–A11, supplementary material) were very similar compared with their trajectories of AD use,

suggesting that our results are robust to different categorizations of medications used to treat symptoms of poor mental health.

Discussion

Using unique multigenerational data, this study examined whether grandparental characteristics that are associated with potential support exchanges between generations predict maternal depression, with a particular focus on separating mothers. Guided by COR theory, previous empirical findings on grandparental support, and prior research on the matrilineal bias in grandparenting, we formulated

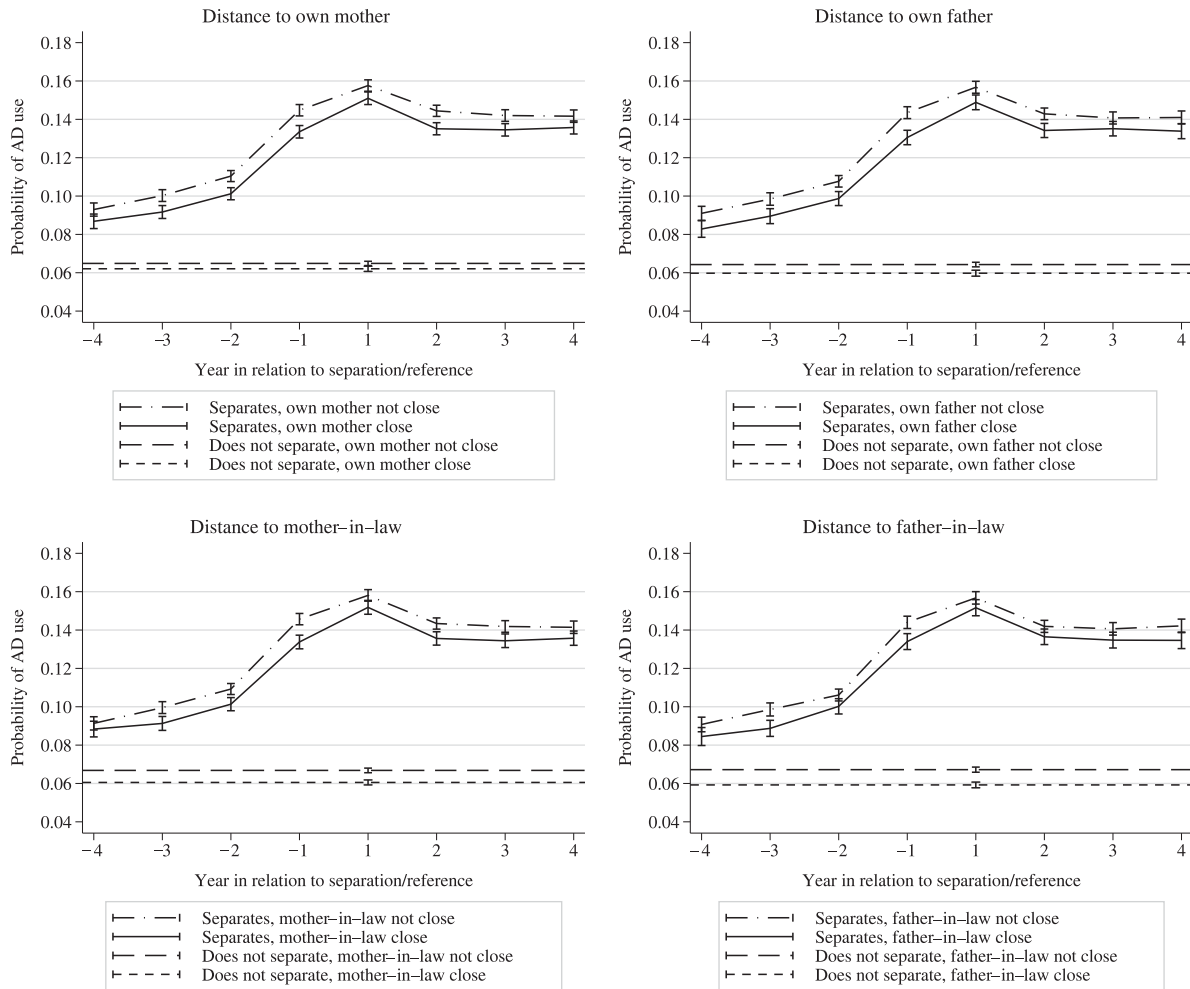


Figure 4 Separating and non-separating mothers' antidepressant use by distance to each grandparent: Finnish mothers born 1945–95

Notes: For separating mothers, year 1 refers to the first year immediately after the date of separation, and year -1 refers to the year immediately before the date of separation. For non-separating mothers, year 1 is the reference year (see Data and methods section). All models are adjusted for calendar year; for the mother's age, socio-economic and family characteristics, and area of residence; and for an interaction between the youngest child's age and follow-up time. Vertical bars indicate 95 per cent confidence intervals.

Source: As for Figure 1.

four hypotheses, two of which were fully and two partly supported by our findings.

First, we expected that grandparental characteristics related to increased availability of support would predict a lower probability of depression among mothers, whereas characteristics related to grandparents' need of support would predict a higher probability of depression (Hypothesis 1). Consistent with this expectation, mothers whose own parents were younger than 70, mothers living close to their child's grandparent(s), and mothers whose own parents were living together experienced a lower probability of depression compared with other mothers, whereas mothers whose own parent had a chronic health condition experienced a

higher probability of depression. Previous studies have consistently shown that younger grandparents in good health are more likely than other grandparents to provide support and childcare (Aassve et al. 2012), and having an old and frail grandparent may even place an additional burden on mothers, as they cannot expect to receive support from such grandparents but instead need to continue providing support upwards (Grundy 2005; Margolis and Wright 2017). Previous research has also shown that whereas a grandmother's propensity to provide support is only weakly—if at all—associated with her partnership status, grandfathers who are not partnered are less likely to provide support to their adult children and grandchildren (Kalmijn 2007;

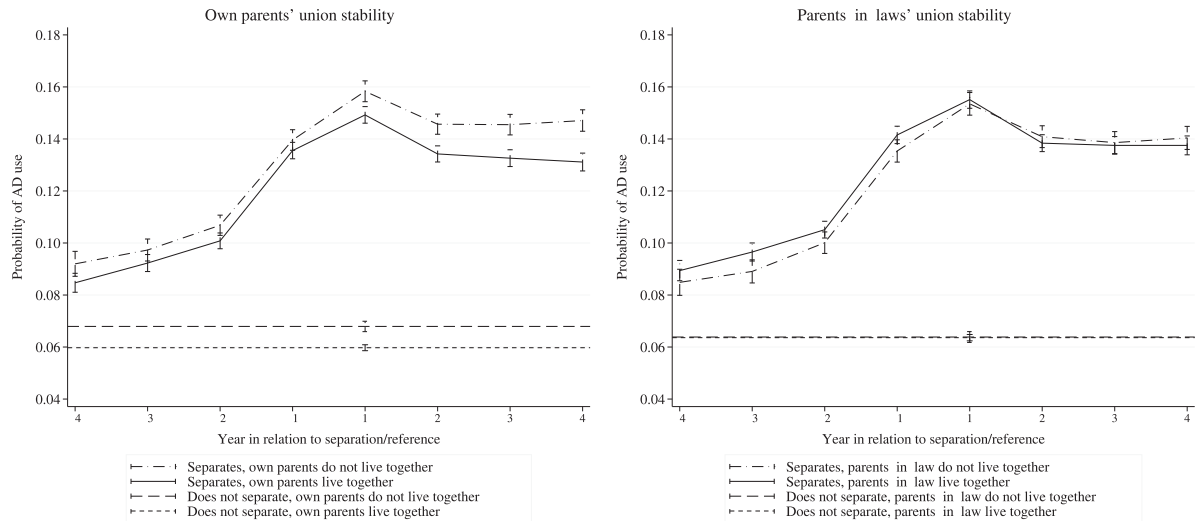


Figure 5 Separating and non-separating mothers' antidepressant use by whether grandparents living together or not: Finnish mothers born 1945–95

Notes: For separating mothers, year 1 refers to the first year immediately after the date of separation, and year –1 refers to the year immediately before the date of separation. For non-separating mothers, year 1 is the reference year (see Data and methods section). All models are adjusted for calendar year; for the mother's age, socio-economic and family characteristics, and area of residence; and for an interaction between the youngest child's age and follow-up time. Vertical bars indicate 95 per cent confidence intervals.

Source: As for Figure 1.

Hank and Buber 2008). Thus, grandparents whose own union is still intact are the ones most likely to provide support to their children and grandchildren. Compared with unmarried grandparents, married grandparents are also less likely to receive support from their adult children (Grundy 2005), and the higher downward flow of support from grandparents in intact unions could partly explain mothers' lower probability of depression.

We also found that the probability of maternal depression was lower if grandparents were still employed, but this result applied only to separating mothers; for non-separating mothers' employment status made little difference. This finding is highly relevant from the perspective of policy initiatives that aim to prolong working lives, as it suggests that grandparents' employment does not necessarily hinder provision of support to younger generations. Employed grandparents are less likely to need support themselves, as participating in work is itself an indication of physical and cognitive functioning, and the income from paid work may enable them to provide better material support to their children and grandchildren.

Second, we expected that due to the matrilineal bias in grandparenting (Daly and Perry 2017; Perry and Daly 2017), characteristics of maternal grandparents, especially the maternal grandmother, would predict the probability of maternal depression

better than the characteristics of the paternal grandparents (Hypothesis 2). Consistent with this hypothesis, the largest differences in maternal depression were observed by maternal grandparents' characteristics, and it was indeed the maternal grandmother whose characteristics seemed most strongly associated with maternal depression. However, although the maternal grandmother's younger age and employment seemed to predict a lower likelihood of maternal depression somewhat more than the maternal grandfather's younger age and employment, the maternal grandmother's and grandfather's poor health were both equally important predictors of a higher likelihood of maternal depression. Thus, mothers may need to provide upward care and support to their own ill parent irrespective of that parent's sex, whereas it is more often the mother's own mother than her father who provides care downwards (Margolis and Wright 2017).

Third, we expected that the potential availability of grandparental support might protect mothers against the adverse mental health effects of separation and single parenthood. Our findings supported Hypothesis 3 only partially. While we did observe that differences in mothers' AD use by whether their own parents were living together or not increased over time since separation, the differences in mothers' probability of depression by grandparents' age, employment, and health were even larger

before separation than after. Although depression clearly increased with approaching separation, the differences in depression among separating mothers by grandparents' age, employment, and health decreased nearer to separation. These findings add to the growing evidence that the long-term effects of adverse life-course events are not necessarily stronger and more persistent among more disadvantaged population subgroups, where the overall level of family resources is lower and there are thus fewer resources to lose (Bernardi and Boertien 2016; Barclay and Hällsten 2022).

Finally, we expected that following separation, the matrilineal bias in grandparenting combined with children's living arrangements would result in increased differences in maternal depression by maternal grandparents' characteristics and decreased differences by paternal grandparents' characteristics. In contrast to Hypothesis 4, differences in maternal depression by their own parents' age, employment, and health declined after separation; however, differences by whether mothers' own parents were living together or not increased further over time since separation. Furthermore, among non-separating mothers, distance from the paternal grandparents appeared more important for maternal depression than distance from the maternal grandparents, whereas among separating mothers, distances from paternal and maternal grandparents seemed equally important. As parent–grandparent relationships are often characterized by ambivalence, and family transitions such as separation may alter the balance between positive and negative emotions (Zartler et al. 2021), it is possible that after separation that contacts with grandparents are a further source of conflict and stress for some mothers (Greenfield 2011). Although grandparents living nearby may in general offer more support than grandparents living further away (Hank 2007; Heylen et al. 2012), this may not hold at a time of conflict. The custodial mother may exercise control over the involvement of paternal grandparents (Douglas and Ferguson 2003; Albertini and Tosi 2018), and this may exacerbate conflict and lead to less support from paternal grandparents, increasing the relative importance of maternal grandparents. In further support of the stronger matrilineal bias among separating mothers, it was more common for non-separating mothers to live close to their paternal grandparents, whereas separating mothers more often lived close to their own parents.

While our study has provided a number of findings that are relevant for understanding how the broader social context shapes individuals' mental health and

the consequences of negative life-course events such as separation, it was not without limitations. Although we were able to measure several characteristics of both the maternal and paternal grandparents, our data set contained no direct measure of support exchanges between mothers and grandparents. We could not observe how often grandparents provided childcare and how involved they were in the lives of their children and grandchildren, nor could we tell how much support the mothers gave to their own parents and (ex-)parents-in-law. However, when examining associations at the population level, we argue that grandparental characteristics that are well-established predictors of grandparental support may be used to estimate the average amount of support exchange between generations. As expectations of grandparental support are known to affect fertility intentions (Rutigliano 2020), it may well be that mothers' mental well-being also depends on the expectation of support at a time of need rather than the support actually received. Furthermore, knowledge of the associations between grandparental characteristics and maternal depression is important in itself. Increased life expectancy coupled with fertility postponement will increase the number of children with old and frail grandparents in future, and our results suggest that these children will be more likely than others to have mothers with depression. Furthermore, in many countries an increasing proportion of children are living with separated mothers (Bernardi et al. 2018), who are even more likely to experience depression. Maternal depression may affect parenting and family functioning, and associations between maternal depression and adverse child outcomes are well established in the literature (Goodman et al. 2011; Claessens et al. 2015; Liu et al. 2017; Trussell et al. 2018; Pierce et al. 2020). Such crossover effects on children underline the importance of better understanding the emergence and course of maternal depression and the role of potential moderating factors such as grandparents' characteristics. We thus encourage future studies to examine in more detail how the downward and upward transfers of support are shaping the mental-health trajectories of the sandwich generation.

No direct information was available on fathers' involvement after separation, but we approximated it by the geographical distance between the separated parents. Longer distance has been shown to limit fathers' involvement (McKenry et al. 1992; Leite and McKenry 2002; Westphal et al. 2014), and in another study, fathers living further away

said they viewed distance as the greatest barrier affecting their relationship with their children (Troilo and Coleman 2013). Fathers who were actively involved in childcare prior to separation also tend to live closer to their children after separation (Thomas et al. 2018). Thus, although we did not have direct information on how involved the fathers who lived close were, living nearby is likely, on average, to indicate more involvement. As shared custody is gaining popularity (Steinbach et al. 2021), future studies should explore whether and how parents' pre-separation mental health might affect the choice of post-separation residential arrangements for their children and what further effects these arrangements have on both parents' mental health. Once these associations are established, studies could explore how grandparents' characteristics might matter for fathers' mental health when they enter single parenthood, shared custody, or non-custodial parenthood and whether the matrilineal bias also exists for them or is instead replaced by a patrilineal bias.

To take advantage of the register linkage between biological relatives, we had to restrict our sample to native-born mothers because grandparental information was poorly available for foreign-born mothers. In Finland, as in other European countries, it will be important for future research to study the importance of grandparents among the increasing number of families with immigrant backgrounds. Furthermore, while our study compared non-separating mothers with mothers who entered single parenthood through separation, future research could adopt a broader perspective and examine how women's other characteristics, such as partnership and fertility behaviours, shape the association between their parents' characteristics and their own mental health. Researchers could also study whether the depression trajectories of separating childless women are moderated by the characteristics of their own parents and (ex-)parents-in-law, as these women do not receive childcare help but may still benefit from other types of support.

In conclusion, our study suggests that support exchanges across generations matter for mothers' mental health, even in the context of a Nordic welfare state where all parents—including single parents—benefit from generous institutional support. Despite concerns about the potential crowding-out effects of public policies, recent contributions to this debate have instead highlighted complementarities between private support exchanged across generations and public support (Albertini et al. 2007; Deindl and Brandt 2011; Albertini and

Kohli 2013; Brandt and Deindl 2013). Our findings add to this debate by revealing that even in the pro-egalitarian context of Finland, potential availability of grandparental support matters for maternal mental health, especially among the vulnerable population subgroup of separating mothers.

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No potential conflict of interest was reported by the authors.

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