

**The Transition to Grandparenthood and its Impact on the Big Five Personality  
Traits and Life Satisfaction**

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**Abstract**

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## **The Transition to Grandparenthood and its Impact on the Big Five Personality Traits and Life Satisfaction**

Becoming a grandparent is a pivotal life event for many people in midlife or old age (Infurna et al., 2020). At the same time, there is considerable heterogeneity in how intensely grandparents are involved in their grandchildren's lives and care (Meyer & Kandic, 2017). In the context of an aging demographic, the time that grandparents are alive and in good health during grandparenthood is prolonged compared to previous generations (Leopold & Skopek, 2015; Margolis & Wright, 2017). In addition, an increased share of childcare functions are being fulfilled by grandparents (Hayslip et al., 2019; Pilkauskas et al., 2020). Thus, intergenerational relations have received heightened attention from psychological and sociological research in recent years (Bengtson, 2001; Coall & Hertwig, 2011). With regard to personality development, the transition to grandparenthood has been posited as an important developmental task in old age (Hutteman et al., 2014). However, empirical research into the psychological consequences of becoming a grandparent is sparse. Testing hypotheses derived from neo-socioanalytic theory (Roberts & Wood, 2006) in a prospective matched control-group design (see Luhmann et al., 2014), we investigate whether the transition to grandparenthood affects the Big Five personality traits and life satisfaction using data from two nationally representative panel studies.

### **Personality Development in Middle Adulthood and Old Age**

The life span perspective characterizes aging as a lifelong process of development and adaptation (Baltes et al., 2006). In accordance with this perspective, research has found personality traits to be subject to change throughout the entire life span (Costa et al., 2019; Graham et al., 2020; Specht, 2017; Specht et al., 2014; for recent reviews, see Bleidorn et al., 2021; Roberts & Yoon, 2021). Although a major portion of personality development takes place in adolescence and emerging adulthood (Bleidorn & Schwaba,

2017; Schwaba & Bleidorn, 2018), evidence has accumulated that personality traits also undergo changes in middle and old adulthood (e.g., Allemand et al., 2008; Damian et al., 2019; Kandler et al., 2015; Lucas & Donnellan, 2011; Möttus et al., 2012; Mueller et al., 2016; Wagner et al., 2016; for a review, see Specht, 2017).

Here, we examine the Big Five personality traits—agreeableness, conscientiousness, extraversion, neuroticism, and openness to experiences—which constitute a broad categorization of universal patterns of thought, affect, and behavior (John et al., 2008). While the policy relevance of the Big Five personality traits has recently been emphasized (Bleidorn et al., 2019)—especially because of their predictive power regarding many important life outcomes (Ozer & Benet-Martínez, 2005; Roberts et al., 2007; Soto, 2021, 2019), we acknowledge that there are other viable taxonomies of personality (Ashton & Lee, 2007, 2020) and other levels of breadth and scope that could add valuable insights to personality development in middle adulthood and old age (Möttus et al., 2017; Möttus & Rozgonjuk, 2021).

Changes over time in the Big Five occur both in mean trait levels (i.e., mean-level change; Roberts et al., 2006) and in the relative ordering of people to each other on trait dimensions (i.e., rank-order stability; Anusic & Schimmack, 2016; Roberts & DelVecchio, 2000). No observed changes in mean trait levels do not necessarily mean that individual trait levels are stable over time, and perfect rank-order stability does not preclude mean-level changes. Mean-level changes in middle adulthood (ca. 30–60 years old; Hutteman et al., 2014) are typically characterized in terms of greater maturity as evidenced by increased agreeableness and conscientiousness, and decreased neuroticism (Damian et al., 2019; Roberts et al., 2006). In old age (ca. 60 years and older; Hutteman et al., 2014), research is generally more sparse but there is some evidence for a reversal of the maturity effect, especially following retirement (sometimes termed *la dolce vita* effect; Asselmann & Specht, 2021; Marsh et al., 2013; cf. Schwaba & Bleidorn, 2019) and at the end of life in ill health (Wagner et al., 2016).

In terms of rank-order stability, some prior studies have shown support for an inverted U-shape trajectory (Ardelt, 2000; Lucas & Donnellan, 2011; Specht et al., 2011; Wortman et al., 2012): Rank-order stability rises until reaching a plateau in midlife, and decreases, again, in old age. However, evidence is mixed whether rank-order stability actually decreases again in old age (see Costa et al., 2019). Nonetheless, the historical view that personality is stable, or “set like plaster” (Specht, 2017, p. 64) after one reaches adulthood (or leaves emerging adulthood behind; Bleidorn & Schwaba, 2017) can largely be abandoned (Specht et al., 2014).

Theories explaining the mechanisms of personality development in middle adulthood and old age emphasize both genetic influences and life experiences as interdependent sources of stability and change (Specht et al., 2014; Wagner et al., 2020). In a behavior-genetic twin study, Kandler et al. (2015) found that non-shared environmental factors were the main source of personality plasticity in old age. Here, we conceptualize the transition to grandparenthood as a life experience that offers the adoption of a new social role according to the social investment principle of neo-socioanalytic theory (Lodi-Smith & Roberts, 2007; Roberts & Wood, 2006). According to the social investment principle, normative life events or transitions such as entering the work force or becoming a parent lead to personality maturation through the adoption of new social roles (Roberts et al., 2005). These new roles encourage or compel people to act in a more agreeable, conscientious, and emotionally stable (i.e., less neurotic) way, and the experiences in these roles as well as societal expectations towards them are hypothesized to drive long-term personality development (Lodi-Smith & Roberts, 2007; Wrzus & Roberts, 2017). Conversely, consistent social roles foster personality stability.

The paradoxical theory of personality coherence (Caspi & Moffitt, 1993) offers another explanation for personality development through role shifts stating that trait change is more likely whenever people transition into unknown environments where pre-existing behavioral responses are no longer appropriate and societal norms or social

expectations give clear indications how to behave instead. On the other hand, stability is favored in environments where no clear guidance how to behave is available. Thus, the finding that age-graded, normative life experiences, such as the transition to grandparenthood, drive personality development would also be in line with the paradoxical theory of personality coherence (see Specht et al., 2014). Compared to the transition to parenthood, however, societal expectations on how grandparents should behave (e.g., “Grandparents should help parents with childcare if needed”) are less clearly defined and strongly dependent on the degree of (possible) grandparental investment (Lodi-Smith & Roberts, 2007). Thus, societal expectations and role demands might differ depending on how close grandparents live to their children, the quality of the relationship with their children, and other sociodemographic factors that exert conflicting role demands (Bordone et al., 2017; Lumsdaine & Vermeer, 2015; Silverstein & Marengo, 2001; cf. Muller & Litwin, 2011). In the whole population of first-time grandparents this diversity of role investment might generate pronounced interindividual differences in intraindividual personality change.

Empirically, certain life events such as the first romantic relationship (Wagner et al., 2015) or the transition from high school to university or the first job (Asselmann & Specht, 2021; Lüdtkke et al., 2011) have (partly) been found to be accompanied by mean-level increases in line with the social investment principle (for a review, see Bleidorn et al., 2018). However, recent evidence regarding the transition to parenthood failed to empirically support the social investment principle (Asselmann & Specht, 2020; van Scheppingen et al., 2016). An analysis of monthly trajectories of the Big Five before and after nine major life events only found limited support for the social investment principle: small increases were found in emotional stability following the transition to employment but not for the other traits or for the other life events theoretically linked to social investment (Denissen et al., 2019). Recently, it has also been emphasized that effects of life events on the Big Five personality trends generally tend to be small and need to be properly analyzed using robust, prospective designs, and appropriate control groups

(Bleidorn et al., 2018; Luhmann et al., 2014).

Overall, much remains unknown regarding the environmental factors underlying personality development in middle adulthood and old age. One indication that age-graded, normative life experiences contribute to change following a period of relative stability in midlife is offered by recent research on retirement (Bleidorn & Schwaba, 2018; Schwaba & Bleidorn, 2019). These results were only partly in line with the social investment principle in terms of mean-level changes and displayed substantial individual differences in change trajectories. The authors discuss that as social role “divestment” (Schwaba & Bleidorn, 2019, p. 660) retirement functions differently compared to social investment in the classical sense which adds a role. The transition to grandparenthood could represent such an investment into a new role in middle adulthood and old age—given that grandparents have regular contact with their grandchild and actively take part in childcare to some degree (i.e., invest psychologically in the new grandparent role; Lodi-Smith & Roberts, 2007).

## **Grandparenthood**

The transition to grandparenthood, that is, the birth of the first grandchild, can be described as a time-discrete life event marking the beginning of one’s status as a grandparent (Luhmann et al., 2012). In terms of characteristics of major life events (Luhmann et al., 2020), the transition to grandparenthood stands out in that it is externally caused (by one’s own children; see also Arpino, Gumà, et al., 2018; Margolis & Verdery, 2019), while at the same time being predictable as soon as one’s children reveal their pregnancy or family planning. The transition to grandparenthood has been labeled a countertransition due to this lack of direct control over if and when someone has their first grandchild (Hagestad & Neugarten, 1985; as cited in Arpino, Gumà, et al., 2018). Grandparenthood is also generally positive in valence and emotionally significant—given one maintains a good relationship with their child.

Grandparenthood can also be characterized as a developmental task (Hutteman et



al., 2014) mostly associated with the period of (early) old age—although considerable variation in the age at the transition to grandparenthood exists both within and between cultures (Leopold & Skopek, 2015; Skopek & Leopold, 2017). Still, the period where parents on average experience the birth of their first grandchild coincides with the end of (relative) stability in terms of personality development in midlife (Specht, 2017), where retirement, shifting social roles, and initial cognitive and health declines can be disruptive to life circumstances putting personality development into motion (e.g., Mueller et al., 2016; Stephan et al., 2014). As a developmental task, grandparenthood is expected to be part of a normative sequence of aging that is subject to societal expectations and values differing across cultures and historical time (Baltes et al., 2006; Hutteman et al., 2014).

Mastering developmental tasks (i.e., fulfilling roles and expectations to a high degree) is hypothesized to drive personality development towards maturation similarly to propositions by the social investment principle, that is, leading to higher levels of agreeableness and conscientiousness, and lower levels of neuroticism (Roberts et al., 2005; Roberts & Wood, 2006). In comparison to the transition to parenthood which has been found to be ambivalent in terms of both personality maturation and life satisfaction (Aassve et al., 2021; Johnson & Rodgers, 2006; Krämer & Rodgers, 2020; van Scheppingen et al., 2016), Hutteman et al. (2014) hypothesize that the transition to grandparenthood is generally seen as positive because it (usually) does not impose the stressful demands of daily childcare on grandparents. Grandparental investment in their grandchildren has been discussed as beneficial in terms of the evolutionary, economic, and sociological advantages it provides for the whole intergenerational family structure (Coall et al., 2018; Coall & Hertwig, 2011).

While we could not find prior studies investigating development of the Big Five over the transition to grandparenthood, there is some evidence on changes in life satisfaction over the transition to grandparenthood. In cross-sectional studies, the preponderance of evidence suggests that grandparents who provide grandchild care or have close

relationships with their older grandchildren have higher life satisfaction (e.g., Mahne & Huxhold, 2014; Triadó et al., 2014). There are a few longitudinal studies, albeit they offer conflicting conclusions: Data from the Survey of Health, Ageing and Retirement in Europe (SHARE) showed that the birth of a grandchild was followed by improvements to quality of life and life satisfaction, but only among women (Tanskanen et al., 2019) and only in first-time grandmothers via their daughters (Di Gessa et al., 2019). Several studies emphasized that grandparents actively involved in childcare experienced larger increases in life satisfaction (Arpino, Bordone, et al., 2018; Danielsbacka et al., 2019; Danielsbacka & Tanskanen, 2016). On the other hand, fixed effects regression models<sup>1</sup> using SHARE data did not find any effects of first-time grandparenthood on life satisfaction regardless of grandparental investment and only minor decreases of grandmothers' depressive symptoms (Sheppard & Monden, 2019).

In a similar vein, some prospective studies reported beneficial effects of the transition to grandparenthood and of grandparental childcare investment on various health measures, especially in women (Chung & Park, 2018; Condon et al., 2018; Di Gessa et al., 2016a, 2016b). Again, beneficial effects on self-rated health did not persevere in fixed effects analyses as reported in Ates (2017) who used longitudinal data from the German Aging Survey (DEAS).

We are not aware of any study investigating the rank-order stability of traits over the transition to grandparenthood. The occurrence of other life events has been shown to be associated with the rank-order stability of personality and well-being, although only for certain events and traits (e.g., Denissen et al., 2019; Hentschel et al., 2017; Specht et al., 2011).

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<sup>1</sup> Fixed effects regression models exclusively rely on within-person variance (see Brüderl & Ludwig, 2015; McNeish & Kelley, 2019).

## Current Study

In the current study, we revisit the development of life satisfaction across the transition to grandparenthood. We extend this research to psychological development in a more general sense by examining the development of Big Five personality traits. Three research questions motivate the current study which is the first to analyze Big Five personality development over the transition to grandparenthood:

1. What are the effects of the transition to grandparenthood on mean-level trajectories of the Big Five traits and life satisfaction?
2. How large are interindividual differences in intraindividual change for the Big Five traits and life satisfaction over the transition to grandparenthood?
3. How does the transition to grandparenthood affect rank-order stability of the Big Five traits and life satisfaction?

To address these questions, we compare development over the transition to grandparenthood with that of matched participants who do not experience the transition during the study period (Luhmann et al., 2014). This is necessary because pre-existing differences between prospective grandparents and non-grandparents in variables related to the development of the Big Five or life satisfaction introduce confounding bias when estimating the effects of the transition to grandparenthood (VanderWeele et al., 2020). The impact of adjusting (or not adjusting) for pre-existing differences, or background characteristics, has recently been emphasized in the prediction of life outcomes from personality in a mega-analytic framework of ten large panel studies (Beck & Jackson, 2021). Propensity score matching is one technique to account for confounding bias by equating the groups in their estimated propensity to experience the event in question (Thoemmes & Kim, 2011). This propensity is calculated from regressing the so-called treatment variable (i.e., the group variable indicating whether someone experienced the event) on covariates related to the likelihood of experiencing the event and to the

outcomes. This approach addresses confounding bias by creating balance between the groups in the covariates used to calculate the propensity score (Stuart, 2010).

We adopt a prospective design that tests the effects of becoming first-time grandparents separately against two propensity-score-matched control groups: first, a matched control group of parents (but not grandparents) with at least one child in reproductive age, and, second, a matched control group of nonparents. Adopting two control groups allows us to disentangle potential effects attributable to becoming a grandparent from effects attributable to being a parent already, thus addressing selection effects into grandparenthood and confounding more comprehensively than previous research. Thereby, we cover the first two of the three causal pathways to not experiencing grandparenthood pointed out by demographic research (Margolis & Verdery, 2019): one's own childlessness, childlessness of one's children, and not living long enough to become a grandparent. Our comparative design also controls for average age-related and historical trends in the Big Five traits and life satisfaction (Luhmann et al., 2014), and enables us to report effects of the transition to grandparenthood unconfounded by instrumentation effects, which describe the tendency of reporting lower well-being scores with each repeated measurement (Baird et al., 2010).<sup>2</sup>

We improve upon previous longitudinal studies utilizing matched control groups (e.g., Anusic et al., 2014a, 2014b; Yap et al., 2012) in that we performed the matching at a specific time point preceding the transition to grandparenthood (at least two years beforehand) and not based on individual survey years. This design choice ensures that the covariates involved in the matching procedure are not already influenced by the event or anticipation of it (Greenland, 2003; Rosenbaum, 1984; VanderWeele, 2019; VanderWeele et al., 2020), thereby reducing the risk of confounding through collider bias (Elwert & Winship, 2014). Similar approaches in the study of life events have recently been adopted

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<sup>2</sup> Instrumentation effects caused by repeated assessments have only been described for life satisfaction but we assume similar biases exist for certain Big Five items.

(Balbo & Arpino, 2016; Krämer & Rodgers, 2020; van Scheppingen & Leopold, 2020).

Informed by the social investment principle and previous research on personality development in middle adulthood and old age, we preregistered the following hypotheses (prior to data analysis; osf.io/):

- H1a: Following the birth of their first grandchild, grandparents increase in agreeableness and conscientiousness, and decrease in neuroticism compared to the matched control groups of parents (but not grandparents) and nonparents. We do not expect the groups to differ in their trajectories of extraversion and openness to experience.
- H1b: Grandparents' post-transition increases in agreeableness and conscientiousness, and decreases in neuroticism are more pronounced among those who provide substantial grandchild care.
- H1c: Grandmothers increase in life satisfaction following the transition to grandparenthood as compared to the matched control groups but grandfathers do not.
- H2: Individual differences in intraindividual change in the Big Five and life satisfaction are larger in the grandparent group than the control groups.
- H3: Compared to the matched control groups, grandparents' rank-order stability of the Big Five and life satisfaction over the transition to grandparenthood is smaller.

Exploratorily, we further probe the moderator performing paid work which could constitute a potential role conflict among grandparents.

## Methods

### Samples

To evaluate these hypotheses, we used data from two population-representative panel studies: the Longitudinal Internet Studies for the Social Sciences (LISS) panel from the Netherlands and the Health and Retirement Study (HRS) from the United States.

The LISS panel is a representative sample of the Dutch population initiated in 2008 with data collection still ongoing (Scherpenzeel, 2011; van der Laan, 2009). It is administered by CentERdata (Tilburg University, The Netherlands). Included households are a true probability sample of households drawn from the population register (Scherpenzeel & Das, 2010). While originally roughly half of invited households consented to participate, refreshment samples were drawn in order to oversample previously underrepresented groups using information about response rates and their association with demographic variables (household type, age, ethnicity; see <https://www.lissdata.nl/about-panel/sample-and-recruitment/>). Data collection was carried out online and participants lacking the necessary technical equipment were outfitted with it. We included yearly assessments from 2008 to 2020 from several different modules (see *Measures*) as well as data on basic demographics which was assessed on a monthly rate. For later coding of covariates from these monthly demographic data we used the first available assessment in each year.

The HRS is an ongoing longitudinal population-representative study of older adults in the US (Sonnega et al., 2014) administered by the Survey Research Center (University of Michigan, United States). Initiated in 1992 with a first cohort of individuals aged 51-61 and their spouses, the study has since been extended with additional cohorts in the 1990s (see <https://hrs.isr.umich.edu/documentation/survey-design/>). In addition to the HRS core interview every two years (in-person or as a telephone survey), the study has since 2006 included a leave-behind questionnaire covering a broad range of psychosocial topics including the Big Five personality traits and life satisfaction. These topics, however, were only administered every four years starting in 2006 for one half of the sample and in 2008 for the other half. We included personality data from 2006 to 2018, all available data for the coding of the transition to grandparenthood from 1996 to 2018, as well as covariate data from 2006 to 2018 including variables drawn from the Imputations File and the Family Data (only available up to 2014).

These two panel studies provided the advantage that they contained several waves of personality data as well as information on grandparent status and a broad range of covariates at each wave. While the HRS provided a large sample with a wider age range, the LISS panel was smaller and younger<sup>3</sup> but provided more frequent personality assessments spaced every one to two years. Note that M. van Scheppingen has previously used the LISS panel to analyze correlated changes between life satisfaction and Big Five traits across the lifespan (<https://osf.io/3cxuy/>). W. Chopik and M. van Scheppingen have previously used the HRS to analyze Big Five traits and relationship-related constructs (van Scheppingen et al., 2019). W. Chopik has additionally used the HRS to analyze mean-level and rank-order changes in Big Five traits in response to bereavement (Chopik, 2018) and other relationship-related or non-Big Five-related constructs (e.g., optimism; Chopik et al., 2020). These publications do not overlap with the current study in the central focus of grandparenthood.<sup>4</sup> The present study used de-identified archival data in the public domain, and, thus, it was not necessary to obtain ethical approval from an IRB.

## Measures

### *Personality*

In the LISS panel, the Big Five personality traits were assessed using the 50-item version of the IPIP Big-Five Inventory scales (Goldberg, 1992). For each Big Five trait, ten 5-point Likert-scale items were answered (1 = *very inaccurate*, 2 = *moderately inaccurate*, 3 = *neither inaccurate nor accurate*, 4 = *moderately accurate*, 5 = *very accurate*). Example items included “Like order” (conscientiousness), “Sympathize with others’ feelings” (agreeableness), “Worry about things” (neuroticism), “Have a vivid imagination” (openness

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<sup>3</sup> The reason for the included grandparents from the LISS panel being younger was that grandparenthood questions were part of the *Work and Schooling* module and—for reasons unknown to us—filtered to participants performing paid work. Thus, older, retired first-time grandparents from the LISS panel could not be identified.

<sup>4</sup> Publications using LISS panel data can be searched at <https://www.dataarchive.lissdata.nl/publications/>. Publications using HRS data can be searched at <https://hrs.isr.umich.edu/publications/biblio/>.

to experience), and “Start conversations” (extraversion). At each wave, we took a participant’s mean of each subscale as their trait score. Internal consistencies at the time of matching, as indicated by McDonald’s  $\omega$  (McNeish, 2018), averaged  $\omega = 0.83$  over all traits ranging from  $\omega = 0.77$  (conscientiousness in the parent control group) to  $\omega = 0.90$  (extraversion in the nonparent control group). Other studies have shown measurement invariance for these scales across time and age groups, and convergent validity with the Big Five inventory (BFI-2) (Denissen et al., 2020; Schwaba & Bleidorn, 2018). The Big Five (and life satisfaction) were contained in the *Personality* module which was administered yearly but with planned missingness in some years for certain cohorts (see Denissen et al., 2019). Thus, there are one to two years between included assessments, given no other sources of missingness.

In the HRS, the Midlife Development Inventory (MIDI) scales were administered to measure the Big Five (Lachman & Weaver, 1997). This instrument was constructed for use in large-scale panel studies of adults and consisted of 26 adjectives (five each for conscientiousness, agreeableness, and extraversion, four for neuroticism, and seven for openness to experience). Participants were asked to rate on a 4-point scale how well each item described them ( $1 = a \text{ lot}$ ,  $2 = some$ ,  $3 = a \text{ little}$ ,  $4 = not \text{ at all}$ ). Example adjectives included “Organized” (conscientiousness), “Sympathetic” (agreeableness), “Worrying” (neuroticism), “Imaginative” (openness to experience), and “Talkative” (extraversion). For better comparability with the LISS panel, we reverse scored all items so that higher values corresponded to higher trait levels and, at each wave, took the mean of each subscale as the trait score. Big Five trait scores showed satisfactory internal consistencies at the time of matching which averaged  $\omega = 0.75$  over all traits ranging from  $\omega = 0.68$  (conscientiousness in the nonparent control group) to  $\omega = 0.81$  (agreeableness in the nonparent control group).



### *Life Satisfaction*

In both samples, life satisfaction was assessed using the 5-item Satisfaction with Life Scale (SWLS; Diener et al., 1985) which participants answered on a 7-point Likert scale (1 = *strongly disagree*, 2 = *somewhat disagree*, 3 = *slightly disagree*, 4 = *neither agree or disagree*, 5 = *slightly agree*, 6 = *somewhat agree*, 7 = *strongly agree*)<sup>5</sup>. An example item was “I am satisfied with my life”. Internal consistency at the time of matching was  $\omega = 0.90$  in the LISS panel with the parent control sample ( $\omega = 0.88$  with the nonparent control sample), and  $\omega = 0.91$  in the HRS with the parent control sample ( $\omega = 0.91$  with the nonparent control sample).

### *Transition to Grandparenthood*

The procedure to obtain information on grandparents’ transition to grandparenthood generally followed the same steps in both samples. The items this coding was based on, however, differed slightly: In the LISS panel, participants were asked “Do you have children and/or grandchildren?” with “children”, “grandchildren”, and “no children or grandchildren” as possible answer categories. This question was part of the *Work and Schooling* module and filtered to participants performing paid work. In the HRS, all participants were asked for the total number of grandchildren: “Altogether, how many grandchildren do you (or your husband / wife / partner, or your late husband / wife / partner) have? Include as grandchildren any children of your (or your [late] husband’s / wife’s / partner’s) biological, step- or adopted children”.<sup>6</sup>

In both samples, we tracked grandparenthood status (0 = *no grandchildren*, 1 = *at least one grandchild*) over time. Due to longitudinally inconsistent data in some cases, we included in the grandparent group only participants with exactly one transition from 0 to 1 in this grandparenthood status variable, and no transitions backwards (see Fig. SX). We

<sup>5</sup> In the LISS panel, the “somewhat” was omitted and instead of “or” “nor” was used.

<sup>6</sup> The listing of biological, step-, or adopted children has been added since wave 2006.

marked participants who continually indicated that they had no grandchildren as potential members of the control groups.

### *Moderators*

Based on insights from previous research, we tested three variables as potential moderators of the mean-level trajectories of the Big Five and life satisfaction over the transition to grandparenthood: First, we analyzed whether gender acted as a moderator as indicated by research on life satisfaction (see Tanskanen et al., 2019; Di Gessa et al., 2019). We coded a dummy variable indicating female gender (0 = *male*, 1 = *female*).

Second, we tested whether performing paid work or not was associated with divergent trajectories of the Big Five and life satisfaction (see Schwaba & Bleidorn, 2019). Since the LISS subsample of grandparents we identified was based exclusively on participants performing paid work, we performed these analyses only in the HRS subsample. This served two purposes: to test how participants involved in the workforce (even if officially retired) differed from those not working, which might shed light on role conflict and have implications for the social investment mechanisms we described earlier. As a robustness check, these moderation tests also allowed us to assess whether potential differences in the main results between the LISS and HRS samples could be accounted for by including performing paid work as a moderator in analyses of the HRS sample. In other words, perhaps the results in the HRS participants performing paid work are similar to those seen in the LISS sample, which had already been conditioned on this variable through filtering in the questionnaire.

Third, we examined how involvement in grandchild care moderated trajectories of the Big Five and life satisfaction in grandparents after the transition to grandparenthood (see Arpino, Bordone, et al., 2018; Danielsbacka et al., 2019; Danielsbacka & Tanskanen, 2016). We coded a dummy variable (0 = *provided less than 100 hours of grandchild care*, 1 = *provided 100 or more hours of grandchild care*) as a moderator based on the question

“Did you (or your [late] husband / wife / partner) spend 100 or more hours in total since the last interview / in the last two years taking care of grand- or great grandchildren?”.<sup>7</sup> This information was only available for grandparents in the HRS; in the LISS panel, too few participants answered follow-up questions on intensity of care to be included in the analyses (<50 in the final analysis sample).

## Procedure

Drawing on all available data, three main restrictions defined the final analysis samples of grandparents (see Fig. SX for participant flowcharts): First, we identified participants who indicated having grandchildren for the first time during study participation (see *Measures*;  $N_{LISS} = 337$ ;  $N_{HRS} = 3272$ , including HRS waves 1996-2004 before personality assessments were introduced). Second, we restricted the sample to participants with at least one valid personality assessment (valid in the sense that at least one of the six outcomes was non-missing;  $N_{LISS} = 335$ ;  $N_{HRS} = 1702$ ).<sup>8</sup> Third, we included only participants with both a valid personality assessment before and one after the transition to grandparenthood ( $N_{LISS} = 253$ ;  $N_{HRS} = 859$ ). Lastly, few participants were excluded because of inconsistent or missing information regarding their children<sup>9</sup> resulting in the final analysis samples of first-time grandparents,  $N_{LISS} = 250$  (53.60% female; age at transition to grandparenthood  $M = 57.94$ ,  $SD = 4.87$ ) and  $N_{HRS} = 846$  (54.85% female; age at transition to grandparenthood  $M = 61.80$ ,  $SD = 6.88$ ).

To disentangle effects of the transition to grandparenthood from effects of being a parent, we defined two pools of potential control subjects to be involved in the matching

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<sup>7</sup> Although dichotomization of a continuous construct (hours of care) is not ideal for moderation analysis (MacCallum et al., 2002), there were too many missing values in the variable assessing hours of care continuously (variables \*E063).

<sup>8</sup> For the HRS subsample, we also excluded  $N = 30$  grandparents in a previous step who reported unrealistically high numbers of grandchildren ( $> 10$ ) in their first assessment following the transition to grandparenthood.

<sup>9</sup> We opted not to use multiple imputation for these child-related variables such as number of children which defined the control groups and were also later used for computing the propensity scores.

procedure: The first pool of potential control subjects comprised parents who had at least one child in reproductive age (defined as  $15 \leq age_{firstborn} \leq 65$ ) but no grandchildren throughout the observation period ( $N_{LISS} = 844$  with 3040 longitudinal observations;  $N_{HRS} = 1485$  with 2703 longitudinal observations). The second pool of potential matches comprised participants who reported being childless throughout the observation period ( $N_{LISS} = 1077$  with 4337 longitudinal observations;  $N_{HRS} = 1340$  with 2346 longitudinal observations). The two control groups were, thus, by definition mutually exclusive.

In order to match each grandparent with the control participant who was most similar in terms of the included covariates we utilized propensity score matching.

### *Covariates*

For propensity score matching, we used a broad set of covariates (VanderWeele et al., 2020) covering participants' demographics (e.g., education), economic situation (e.g., income), and health (e.g., mobility difficulties). We also included the pre-transition outcome variables as covariates—as recommended in the literature (Cook et al., 2020; Hallberg et al., 2018; Steiner et al., 2010; VanderWeele et al., 2020), as well as the panel wave participation count and assessment year in order to control for instrumentation effects and historical trends (e.g., 2008/2009 financial crisis; Baird et al., 2010; Luhmann et al., 2014). For matching grandparents with the parent control group we additionally included as covariates variables containing information on fertility and family history (e.g., number of children, age of first three children) which were causally related to the timing of the transition to grandparenthood (i.e., entry into treatment; Arpino, Gumà, et al., 2018; Margolis & Verdery, 2019).

Covariate selection has seldom been explicitly discussed in previous longitudinal studies estimating treatment effects of life events (e.g., in matching designs). We see two (in part conflicting) traditions that address covariate selection: First, classical recommendations from psychology argue to include all available variables that are

associated with both the treatment assignment process (i.e., selection into treatment) and the outcome (e.g., Steiner et al., 2010; Stuart, 2010). Second, recommendations from a structural causal modeling perspective (see Elwert & Winship, 2014; Rohrer, 2018) are more cautious aiming to avoid pitfalls such as conditioning on a pre-treatment collider (collider bias) or a mediator (overcontrol bias). Structural causal modeling, however, requires advanced knowledge of the causal structures underlying all involved variables (Pearl, 2009).

In selecting covariates, we followed guidelines laid out by VanderWeele et al. (2019; 2020) which reconcile both views and offer practical guidance<sup>10</sup> when complete knowledge of the underlying causal structures is unknown: These authors propose a “modified disjunctive cause criterion” (VanderWeele, 2019, p. 218) recommending to select all available covariates which are assumed to be causes of the outcomes, treatment exposure (i.e., the transition to grandparenthood), or both, as well as any proxies for an unmeasured common cause of the outcomes and treatment exposure. To be excluded from this selection are variables assumed to be instrumental variables (i.e., assumed causes of treatment exposure that are unrelated to the outcomes except through the exposure) and collider variables (Elwert & Winship, 2014). Because all covariates we used for matching were measured at least two years before the birth of the grandchild, we judge the risk of introducing collider bias or overcontrol bias by controlling for these covariates to be relatively small. In addition, as mentioned in the *Introduction*, the event transition to grandparenthood is not planned by or under direct control of grandparents which further reduces the risk of bias introduced by controlling for pre-treatment colliders.

An overview of the variables we used to compute the propensity scores for matching can be found in the Supplemental Material (see also Tables S5 & S6). Critically, we also provide justification for each covariate on whether we assume it to be causally related to

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<sup>10</sup> Practical considerations of covariate selection when using large archival datasets (i.e., with no direct control over data collection) are discussed in VanderWeele et al. (2020).

treatment assignment, the outcomes, or both. We tried to find substantively equivalent covariates in both samples but had to compromise in a few cases (e.g., children’s educational level only in HRS vs. children living at home only in LISS).

Estimating propensity scores requires complete covariate data. Therefore, before computing propensity scores, we performed multiple imputations in order to account for missingness in our covariates (Greenland & Finkle, 1995). Using five imputed data sets computed by classification and regression trees (CART; Burgette & Reiter, 2010) in the *mice* R package (van Buuren & Groothuis-Oudshoorn, 2011), we predicted treatment assignment (i.e., the transition to grandparenthood) five times per observation in logistic regressions with a logit link function.<sup>11</sup> We averaged these five scores per observation to compute the final propensity score to be used for matching (Mitra & Reiter, 2016). We used imputed data only for propensity score computation and not in later analyses because missing data in the outcome variables due to nonresponse was negligible.

### ***Propensity Score Matching***

Propensity score matching was performed in a grandparent’s survey year which preceded the year when the transition was first reported by at least two years (aside from that choosing the smallest available gap between matching and transition). This served the purpose to ensure that the covariates used for matching were not affected by the event itself or its anticipation (i.e., when one’s child was already pregnant with their first child; Greenland, 2003; Rosenbaum, 1984; VanderWeele et al., 2020). Propensity score matching was performed using the *MatchIt* R package (Ho et al., 2011) with exact matching on gender combined with Mahalanobis distance matching on the propensity score. In total, four matchings were performed; two per sample (LISS; HRS) and two per control group (parents but not grandparents; nonparents). We matched 1:4 with replacement because of

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<sup>11</sup> In these logistic regressions we included all covariates listed above as predictors except for *female* which was later used for exact matching and health-related covariates in LISS-wave 2014 which were not assessed in that wave.

the relatively small pools of available non-grandparent controls. This meant that each grandparent was matched with four control observations in each matching procedure, and that control observations were allowed to be used multiple times for matching (i.e., duplicated in the analysis samples<sup>12</sup>). We did not specify a caliper because our goal was to find matches for all grandparents, and because we achieved satisfactory covariate balance this way.

We evaluated the matching procedure in terms of covariate balance and, graphically, in terms of overlap of the distributions of the propensity scores and (non-categorical) covariates (Stuart, 2010). Covariate balance as indicated by the standardized difference in means between the grandparent and the controls after matching was satisfactory (see Tables S5 & S6) lying below 0.25 as recommended in the literature (Stuart, 2010), and below 0.10 with few exceptions (Austin, 2011). Graphically, differences between the distributions of the propensity score and the covariates were also small and indicated no missing overlap (see Fig. SX).

After matching, each matched control observation received the same value as their matched grandparent in the *time* variable describing the temporal relation to treatment, and the control subject's other longitudinal observations were centered around this matched observation. Thereby, we coded a counterfactual transition time frame for each control subject. Due to left- and right-censored longitudinal data (i.e., panel entry or attrition), we restricted the final analysis samples to six years before and six years after the transition as shown in Table S2. We analyzed unbalanced panel data where not every participant provided all person-year observations. The final LISS analysis samples, thus, contained 250

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<sup>12</sup> In the LISS data, 250 grandparent observations were matched with 1000 control observations (matching with replacement); these control observations corresponded to 523 unique person-year observations stemming from 270 unique participants for the parent control group, and to 464 unique person-year observations stemming from 189 unique participants for the nonparent control group. In the HRS data, 846 grandparent observations were matched with 3384 control observations (matching with replacement); these control observations corresponded to 1393 unique person-year observations stemming from 982 unique participants for the parent control group, and to 1008 unique person-year observations stemming from 704 unique participants for the nonparent control group.

grandparents with 1368 longitudinal observations, matched with 1000 control subjects with either 5167 (parent control group) or 5340 longitudinal observations (nonparent control group). The final HRS analysis samples contained 846 grandparents with 2262 longitudinal observations, matched with 3384 control subjects with either 8257 (parent control group) or 8167 longitudinal observations (nonparent control group; see Table S2. In the HRS, there were a few additional missing values in the outcomes ranging from 18 to 105 longitudinal observations which will be listwise deleted in the respective analyses.

## Analytical Strategy

We used R (Version 4.0.4; R Core Team, 2021) and the R-packages *lme4* (Version 1.1.26; Bates et al., 2015), and *lmerTest* (Version 3.1.3; Kuznetsova et al., 2017) for multilevel modeling, as well as *tidyverse* (Wickham et al., 2019) for data wrangling, and *papaja* (Aust & Barth, 2020) for reproducible manuscript production. Additional modeling details and a list of all software we used is provided in the Supplemental Material. In line with Benjamin et al. (2018), we set the  $\alpha$ -level for all confirmatory analyses to .005.

Our design can be referred to as an interrupted time-series with a “nonequivalent no-treatment control group” (Shadish et al., 2002, p. 182) where treatment, that is, the transition to grandparenthood, is not deliberately manipulated. First, to analyze mean-level changes, we used linear piecewise regression coefficients in multilevel regression models with person-year observations nested within participants and households (Hoffman, 2015). To model change over time in relation to the birth of the first grandchild, we coded three piecewise regression coefficients: a *before-slope* representing linear change in the years leading up to the transition to grandparenthood, an *after-slope* representing linear change in the years after the transition, and a *shift* coefficient shifting the intercept directly after the transition was first reported, thus representing sudden changes that go beyond changes already modeled by the *after-slope* (see Table S2 for the coding scheme of these coefficients; Hoffman, 2015). Other studies of personality development have recently adopted similar



566 piecewise growth-curve models (e.g., Bleidorn & Schwaba, 2018; Krämer & Rodgers, 2020;  
567 Schwaba & Bleidorn, 2019; van Scheppingen & Leopold, 2020).

568 All effects of the transition to grandparenthood on the Big Five and life satisfaction  
569 were modeled as deviations from patterns in the matched control groups by interacting the  
570 three piecewise coefficients with the binary treatment variable ( $0 = \textit{control}$ ,  $1 =$   
571 *grandparent*). In additional models, we interacted these coefficients with the binary  
572 moderator variables resulting in two- or three-way interactions. To test differences in the  
573 growth parameters between two groups in cases where these differences were represented by  
574 multiple fixed-effects coefficients, we defined linear contrasts using the *linearHypothesis*  
575 command from the *car* R package (Fox & Weisberg, 2019). All models of mean-level  
576 changes were estimated using maximum likelihood and included random intercepts but no  
577 random slopes of the piecewise regression coefficients. We included the propensity score as  
578 a level-2 covariate for a double-robust approach (Austin, 2017).

579 Second, to assess interindividual differences in intraindividual change in the Big Five  
580 and life satisfaction we added random slopes to the models assessing mean-level changes  
581 (see Denissen et al., 2019 for a similar approach). In other words, we allowed for differences  
582 between individuals in their trajectories of change to be modeled, that is, differences in the  
583 *before-slope*, *after-slope*, and *shift* coefficients. Because multiple simultaneous random  
584 slopes are often not computationally feasible, we added random slopes one at a time and  
585 used likelihood ratio test to determine whether the addition of the respective random slope  
586 led to a significant improvement in model fit. We plotted distributions of random slopes  
587 (for a similar approach, see Denissen et al., 2019; Doré & Bolger, 2018). To statistically  
588 test differences in the random slope variance between the grandparent group and each  
589 control group, we respecified the multilevel models as heterogeneous variance models using  
590 the *nlme* R package (Pinheiro et al., 2021), which allows for separate random slope  
591 variances to be estimated in the grandparent group and the control group within the same  
592 model. Model fit of these heterogeneous variance models was compared to the

corresponding models with a homogeneous (single) random slope variance via likelihood ratio tests. This was also done separately for the parent and nonparent control groups.

Third, to examine rank-order stability in the Big Five and life satisfaction over the transition to grandparenthood, we computed the test-retest correlation of measurements prior to the transition to grandparenthood (at the time of matching) with the first available measurement after the transition. To test the difference in test-retest stability between grandparents and either of the control groups, we then entered the pre-treatment measure as well as the treatment variable ( $0 = \textit{control}$ ,  $1 = \textit{grandparent}$ ) and their interaction into multiple regression models predicting the Big Five and life satisfaction. These interactions test for significant differences in the test-retest stability between those who experienced the transition to grandparenthood and those who did not (for a similar approach, see Denissen et al., 2019; McCrae, 1993).

## Results

## Discussion

Based on

- personality maturation cross-culturally: (Bleidorn et al., 2013; Chopik & Kitayama, 2018)
- facets / nuances (Mõttus & Rozgonjuk, 2021)
- arrival of grandchild associated with retirement decisions (Lumsdaine & Vermeer, 2015); pers X WB interaction over retirement (Henning et al., 2017);
- Does the Transition to Grandparenthood Deter Gray Divorce? A Test of the Braking Hypothesis (Brown et al., 2021)
- prolonged period of grandparenthood? (Margolis & Wright, 2017)
- subjective experience of aging (Bordone & Arpino, 2015)
- policy relevance of personality (Bleidorn et al., 2019), e.g., health outcomes (Turiano et al., 2012), but not really evidence for healthy neuroticism (Turiano et al., 2020)
- mortality & grandparenthood(Christiansen, 2014); moderated by race? (Choi, 2020); but see HRS -> “Grandparenthood overall was unassociated with mortality risk in both women and men” (Ellwardt et al., 2021) -> (Hilbrand et al., n.d.): “Survival analyses based on data from the Berlin Aging Study revealed that mortality hazards for grandparents who provided non-custodial childcare were 37% lower than for grandparents who did not provide childcare and for non-grandparents. These associations held after controlling for physical health, age, socioeconomic status and various characteristics of the children and grandchildren.”
- “Older grandparents tended to provide financial assistance and more strongly identified with the role. When their grandchildren were younger, grandparents tended

to interact more with them, share more activities, provide baby-sitting, and receive more symbolic rewards from the grandparent role.” (Silverstein & Marengo, 2001)

- “refutes the central claim of role theory according to which salient roles are more beneficial to the psychological well-being of the individual than are other roles, especially in old age. It also questions the theoretical framework of grandparent role meaning that is commonly cited in the literature” (Muller & Litwin, 2011) → see also (Condon et al., 2019): First-Time Grandparents’ Role Satisfaction and Its Determinants
- “maternal grandmothers tend to invest the most in their grandchildren, followed by maternal grandfathers, then paternal grandmothers, with paternal grandfathers investing the least“ → also: call for causally informed designs! (Coall & Hertwig, 2011) → discusses grandparental role investment from an evolutionary perspective → see also (Danielsbacka et al., 2011)
- factors determining grandparental investement: (Coall et al., 2014)
- relation to well-being: (Danielsbacka & Tanskanen, 2016)
- “Over the last two decades, the share of U.S. children under age 18 who live in a multigenerational household (with a grandparent and parent) has increased dramatically“ (Pilkauskas et al., 2020) → for Germany:”on the basis of the DEAS data, the share of grandparents who take care of their grandchildren increased between 2008 and 2014" (Mahne & Klaus, 2017)
- other countries with different childcare systems: (Bordone et al., 2017); “in countries with scarce publicly funded daycare services and parental leave grandparental care is often provided on a daily basis”; (Hank & Buber, 2009)
- differences in Big Five assessment: HRS adjectives vs. LISS statements

## 653 **Limitations**

654       Despite

## 655 **Conclusions**

656       Our

## 657 **Acknowledgements**

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Table 1

*Fixed Effects of Agreeableness Over the Transition to Grandparenthood.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI	$t$	$p$
LISS								
Intercept, $\hat{\gamma}_{00}$	3.86	[3.80, 3.92]	131.70	< .001	3.90	[3.83, 3.97]	112.97	< .001
Propensity score, $\hat{\gamma}_{02}$	-0.02	[-0.10, 0.05]	-0.56	.572	-0.01	[-0.08, 0.06]	-0.20	.838
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.00]	-0.25	.802	-0.01	[-0.01, 0.00]	-1.81	.070
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.02, -0.01]	-6.76	< .001	-0.01	[-0.01, 0.00]	-3.32	.001
Shift, $\hat{\gamma}_{30}$	0.04	[0.01, 0.06]	3.12	.002	0.03	[0.00, 0.05]	1.98	.048
Grandparent, $\hat{\gamma}_{01}$	0.06	[-0.03, 0.15]	1.33	.183	0.01	[-0.08, 0.11]	0.30	.768
Before-slope * Grandparent, $\hat{\gamma}_{11}$	-0.01	[-0.02, 0.01]	-1.06	.289	0.00	[-0.01, 0.01]	-0.26	.791
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.02	[0.01, 0.03]	2.99	.003	0.01	[0.00, 0.02]	1.44	.149
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.01	[-0.06, 0.04]	-0.37	.714	0.00	[-0.06, 0.06]	0.08	.937
HRS								
Intercept, $\hat{\gamma}_{00}$	3.46	[3.43, 3.50]	196.32	< .001	3.48	[3.44, 3.52]	166.19	< .001
Propensity score, $\hat{\gamma}_{02}$	0.08	[0.02, 0.14]	2.51	.012	0.05	[-0.01, 0.11]	1.51	.131
Before-slope, $\hat{\gamma}_{10}$	0.01	[0.00, 0.02]	1.37	.169	-0.01	[-0.02, 0.00]	-1.33	.184
After-slope, $\hat{\gamma}_{20}$	-0.01	[-0.02, 0.00]	-2.87	.004	-0.02	[-0.02, -0.01]	-5.16	< .001
Shift, $\hat{\gamma}_{30}$	0.01	[-0.01, 0.03]	0.71	.476	0.04	[0.02, 0.06]	4.30	< .001
Grandparent, $\hat{\gamma}_{01}$	0.02	[-0.03, 0.08]	0.88	.378	0.01	[-0.04, 0.07]	0.44	.662
Before-slope * Grandparent, $\hat{\gamma}_{11}$	-0.01	[-0.04, 0.01]	-0.87	.384	0.00	[-0.02, 0.03]	0.28	.781
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.01	[0.00, 0.03]	1.71	.088	0.02	[0.01, 0.04]	2.78	.006
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.01	[-0.05, 0.04]	-0.35	.729	-0.04	[-0.09, 0.00]	-1.97	.049

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 2

Linear Contrasts for Agreeableness.

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.02	4.00	.046	0.02	2.22	.136
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.03	1.79	.181	0.03	1.51	.219
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.01	0.08	.779	0.01	0.18	.668
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	-0.01	1.72	.189	-0.01	1.45	.228
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.00	0.01	.934	0.00	0.00	.958
HRS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.00	0.12	.725	0.03	10.76	.001
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.00	0.03	.859	0.00	0.03	.862
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.01	0.10	.751	-0.02	1.77	.183
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.00	0.09	.762	0.00	0.11	.743
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.00	0.23	.633	0.00	0.28	.596

Note. The linear contrasts are needed in cases where estimates of interest are represented by multiple fixed-effects coefficients and are computed using the *linearHypothesis* function from the *car* R package (Fox & Weisberg, 2019) based on the models from Table 1.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 3

*Fixed Effects of Agreeableness Over the Transition to Grandparenthood Moderated by Gender.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	95% CI	t	p
<b>LISS</b>								
Intercept, $\hat{\gamma}_{00}$	3.65	[3.58, 3.73]	93.02	< .001	3.66	[3.57, 3.75]	79.73	< .001
Propensity score, $\hat{\gamma}_{04}$	-0.01	[-0.08, 0.07]	-0.21	.833	0.02	[-0.05, 0.08]	0.45	.653
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.01]	0.02	.984	0.00	[-0.01, 0.01]	-0.37	.712
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.03, -0.02]	-6.37	< .001	-0.01	[-0.02, 0.00]	-2.49	.013
Shift, $\hat{\gamma}_{30}$	0.03	[-0.01, 0.07]	1.66	.097	0.07	[0.03, 0.11]	3.66	< .001
Grandparent, $\hat{\gamma}_{01}$	0.06	[-0.06, 0.17]	0.92	.356	0.04	[-0.09, 0.17]	0.60	.550
Female, $\hat{\gamma}_{02}$	0.38	[0.27, 0.48]	7.16	< .001	0.44	[0.32, 0.56]	7.11	< .001
Before-slope * Grandparent, $\hat{\gamma}_{11}$	-0.01	[-0.03, 0.01]	-0.73	.466	0.00	[-0.02, 0.01]	-0.50	.615
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.03	[0.01, 0.05]	3.43	.001	0.01	[0.00, 0.03]	1.64	.101
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.01	[-0.09, 0.07]	-0.33	.739	-0.05	[-0.14, 0.03]	-1.23	.217
Before-slope * Female, $\hat{\gamma}_{12}$	0.00	[-0.01, 0.01]	-0.26	.799	-0.01	[-0.02, 0.00]	-1.14	.254
After-slope * Female, $\hat{\gamma}_{22}$	0.01	[0.00, 0.02]	2.34	.019	0.00	[-0.01, 0.01]	0.28	.781
Shift * Female, $\hat{\gamma}_{32}$	0.02	[-0.03, 0.06]	0.60	.550	-0.08	[-0.14, -0.03]	-3.18	.001
Grandparent * Female, $\hat{\gamma}_{03}$	0.01	[-0.15, 0.17]	0.15	.883	-0.05	[-0.22, 0.12]	-0.57	.568
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	0.00	[-0.03, 0.02]	-0.05	.959	0.00	[-0.02, 0.03]	0.35	.728
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	-0.02	[-0.04, 0.00]	-1.92	.056	-0.01	[-0.03, 0.01]	-0.93	.351
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.01	[-0.10, 0.12]	0.21	.836	0.11	[-0.01, 0.23]	1.87	.061
<b>HRS</b>								
Intercept, $\hat{\gamma}_{00}$	3.27	[3.23, 3.32]	132.82	< .001	3.38	[3.33, 3.43]	122.35	< .001
Propensity score, $\hat{\gamma}_{04}$	0.09	[0.03, 0.15]	2.91	.004	0.04	[-0.03, 0.10]	1.12	.261
Before-slope, $\hat{\gamma}_{10}$	0.02	[0.01, 0.04]	2.98	.003	-0.01	[-0.02, 0.01]	-1.12	.262
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.03, -0.01]	-3.95	< .001	-0.02	[-0.03, -0.01]	-3.43	.001
Shift, $\hat{\gamma}_{30}$	0.04	[0.01, 0.07]	2.77	.006	0.03	[0.00, 0.06]	1.68	.093
Grandparent, $\hat{\gamma}_{01}$	0.08	[0.00, 0.16]	1.97	.048	-0.01	[-0.09, 0.08]	-0.16	.877
Female, $\hat{\gamma}_{02}$	0.33	[0.27, 0.39]	10.55	< .001	0.20	[0.13, 0.26]	5.76	< .001
Before-slope * Grandparent, $\hat{\gamma}_{11}$	-0.04	[-0.08, 0.00]	-2.18	.030	-0.01	[-0.04, 0.03]	-0.47	.640
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.04	[0.01, 0.06]	3.00	.003	0.03	[0.01, 0.05]	2.85	.004
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.05	[-0.12, 0.02]	-1.50	.133	-0.03	[-0.10, 0.03]	-1.04	.298
Before-slope * Female, $\hat{\gamma}_{12}$	-0.03	[-0.05, -0.01]	-2.84	.004	0.00	[-0.02, 0.02]	0.38	.702
After-slope * Female, $\hat{\gamma}_{22}$	0.02	[0.01, 0.03]	2.74	.006	0.00	[-0.01, 0.01]	0.08	.937
Shift * Female, $\hat{\gamma}_{32}$	-0.06	[-0.11, -0.02]	-3.07	.002	0.03	[-0.01, 0.07]	1.50	.134

Table 3 continued

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI	$t$	$p$
Grandparent * Female, $\hat{\gamma}_{03}$	-0.10	[-0.20, 0.01]	-1.77	.077	0.03	[-0.07, 0.14]	0.64	.521
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	0.06	[0.01, 0.11]	2.20	.028	0.02	[-0.03, 0.07]	0.86	.392
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	-0.04	[-0.07, -0.01]	-2.48	.013	-0.02	[-0.05, 0.01]	-1.34	.180
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.08	[-0.01, 0.17]	1.73	.084	-0.01	[-0.10, 0.07]	-0.31	.758

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 4

*Linear Contrasts for Agreeableness (Moderated by Gender).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
<b>LISS</b>						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.01	0.19	.665	0.06	13.04	< .001
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.03	5.25	.022	-0.02	1.90	.168
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.02	0.47	.493	0.02	0.40	.525
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.04	1.79	.181	0.04	1.56	.212
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.01	0.17	.678	-0.04	1.05	.305
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	-0.01	0.78	.376	0.00	0.00	.971
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.01	0.78	.377	0.00	0.15	.695
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.00	0.02	.886	0.06	3.02	.082
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.03	1.51	.219	-0.08	12.80	< .001
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.00	0.03	.853	0.00	0.03	.857
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.01	0.92	.337	-0.01	0.82	.366
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.02	0.15	.695	0.02	0.14	.712
<b>HRS</b>						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.02	3.34	.067	0.01	0.41	.520
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.02	4.49	.034	0.04	14.19	< .001
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.01	0.05	.818	0.01	0.05	.815
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.00	0.01	.927	0.00	0.01	.936
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.02	0.39	.531	0.00	0.01	.929
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.01	0.74	.390	0.01	0.58	.445
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.00	0.15	.701	0.01	1.32	.250
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.02	1.07	.301	-0.04	2.61	.106
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.04	7.70	.006	0.03	3.92	.048
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.02	1.17	.279	0.02	1.28	.258
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.02	1.94	.163	-0.02	2.13	.144
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.00	0.01	.912	0.00	0.01	.904

*Note.* The linear contrasts are based on the models from Table 3.  $\hat{\gamma}_c$  = combined fixed-effects estimate.



Table 5

*Fixed Effects of Agreeableness Over the Transition to Grandparenthood Moderated by Performing Paid Work.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	$\hat{\gamma}$	95% CI	t
Intercept, $\hat{\gamma}_{00}$	3.50	[3.45, 3.54]	157.26	3.48	[3.43, 3.52]	138.40
Propensity score, $\hat{\gamma}_{04}$	0.09	[0.03, 0.15]	2.93	0.04	[-0.03, 0.10]	1.14
Before-slope, $\hat{\gamma}_{10}$	0.01	[-0.01, 0.03]	0.91	0.00	[-0.02, 0.02]	-0.23
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.03, -0.01]	-4.07	-0.03	[-0.04, -0.02]	-5.38
Shift, $\hat{\gamma}_{30}$	-0.01	[-0.04, 0.02]	-0.53	0.07	[0.03, 0.10]	3.93
Grandparent, $\hat{\gamma}_{01}$	-0.11	[-0.20, -0.02]	-2.33	-0.07	[-0.16, 0.02]	-1.49
Working, $\hat{\gamma}_{02}$	-0.06	[-0.10, -0.02]	-2.77	0.01	[-0.03, 0.05]	0.61
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.04	[-0.01, 0.09]	1.55	0.05	[0.00, 0.10]	2.09
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.02	[0.00, 0.05]	1.96	0.03	[0.01, 0.05]	2.68
Shift * Grandparent, $\hat{\gamma}_{31}$	0.00	[-0.08, 0.07]	-0.07	-0.08	[-0.15, -0.01]	-2.17
Before-slope * Working, $\hat{\gamma}_{12}$	0.00	[-0.03, 0.02]	-0.30	0.00	[-0.03, 0.02]	-0.37
After-slope * Working, $\hat{\gamma}_{22}$	0.02	[0.01, 0.04]	2.87	0.02	[0.01, 0.03]	2.83
Shift * Working, $\hat{\gamma}_{32}$	0.02	[-0.03, 0.06]	0.77	-0.04	[-0.08, 0.00]	-1.87
Grandparent * Working, $\hat{\gamma}_{03}$	0.18	[0.08, 0.28]	3.68	0.11	[0.02, 0.20]	2.40
Before-slope * Grandparent * Working, $\hat{\gamma}_{13}$	-0.06	[-0.12, -0.01]	-2.15	-0.06	[-0.12, -0.01]	-2.22
After-slope * Grandparent * Working, $\hat{\gamma}_{23}$	-0.02	[-0.05, 0.02]	-0.97	-0.01	[-0.05, 0.02]	-0.94
Shift * Grandparent * Working, $\hat{\gamma}_{33}$	-0.01	[-0.10, 0.09]	-0.11	0.05	[-0.04, 0.14]	1.08

*Note.* Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *working* = 1 indicates being employed in paid work.

Table 6

*Linear Contrasts for Agreeableness (Moderated by Paid Work; only HRS).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
Shift of not-working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	-0.03	5.08	.024	0.04	7.79	.005
Shift of working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.01	0.52	.472	0.02	3.86	.049
Shift of not-working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.01	0.14	.713	-0.01	0.15	.699
Shift of working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{23} + \hat{\gamma}_{32} + \hat{\gamma}_{33}$ )	0.01	0.10	.755	0.01	0.09	.768
Shift of not-working controls vs. not-working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.02	0.44	.505	-0.05	2.76	.097
Before-slope of working controls vs. working grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	-0.02	2.73	.099	-0.01	0.76	.383
After-slope of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.01	0.36	.548	0.02	2.00	.157
Shift of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.00	0.00	.966	-0.01	0.35	.553
Shift of not-working controls vs. working controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.04	4.89	.027	-0.02	1.43	.232
Before-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	-0.07	6.12	.013	-0.07	6.87	.009
After-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.01	0.12	.734	0.01	0.13	.714
Shift of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.02	0.22	.637	0.02	0.23	.633

*Note.* The linear contrasts are based on the models from Table 5.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 7

*Fixed Effects of Agreeableness Over the Transition to Grandparenthood Moderated by Grandchild Care.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	95% CI
Intercept, $\hat{\gamma}_{00}$	3.47	[3.43, 3.52]	155.84	< .001	3.47	[3.42, 3.53]
Propensity score, $\hat{\gamma}_{04}$	0.16	[0.08, 0.24]	3.91	< .001	0.15	[0.07, 0.23]
After-slope, $\hat{\gamma}_{10}$	-0.02	[-0.03, -0.01]	-4.36	< .001	-0.02	[-0.03, -0.01]
Grandparent, $\hat{\gamma}_{01}$	-0.04	[-0.11, 0.03]	-1.16	.246	-0.05	[-0.12, 0.02]
Caring, $\hat{\gamma}_{02}$	0.00	[-0.04, 0.03]	-0.27	.784	0.02	[-0.01, 0.05]
After-slope * Grandparent, $\hat{\gamma}_{11}$	0.03	[0.00, 0.05]	2.36	.018	0.02	[0.00, 0.04]
After-slope * Caring, $\hat{\gamma}_{12}$	0.00	[-0.01, 0.02]	0.29	.773	0.00	[-0.02, 0.01]
Grandparent * Caring, $\hat{\gamma}_{03}$	0.02	[-0.07, 0.11]	0.46	.645	0.00	[-0.09, 0.08]
After-slope * Grandparent * Caring, $\hat{\gamma}_{13}$	0.01	[-0.02, 0.04]	0.57	.572	0.02	[-0.02, 0.05]

*Note.* Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *caring* = 1 indicates more than 100 hours of grandchild care since the last assessment.

Table 8

*Linear Contrasts for Agreeableness (Moderated by Grandchild Care; only HRS).*

Linear Contrast	Parent controls		Nonparent controls	
	$\hat{\gamma}_c$	$\chi^2$	$\hat{\gamma}_c$	$\chi^2$
After-slope of caring controls vs. caring grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.04	7.62	0.04	9.15
After-slope of not-caring grandparents vs. caring grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.01	0.61	0.01	0.66

*Note.* The linear contrasts are based on the models from Table 7.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 9

*Fixed Effects of Conscientiousness Over the Transition to Grandparenthood.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	95% CI
LISS						
Intercept, $\hat{\gamma}_{00}$	3.77	[3.72, 3.83]	130.27	< .001	3.82	[3.75, 3.88]
Propensity score, $\hat{\gamma}_{02}$	0.00	[-0.08, 0.08]	-0.02	.987	0.01	[-0.06, 0.08]
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.00]	-0.84	.402	0.00	[-0.01, 0.01]
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.02, -0.01]	-6.17	< .001	0.01	[0.00, 0.01]
Shift, $\hat{\gamma}_{30}$	0.04	[0.02, 0.07]	3.14	.002	0.00	[-0.03, 0.02]
Grandparent, $\hat{\gamma}_{01}$	-0.01	[-0.10, 0.08]	-0.24	.813	-0.06	[-0.15, 0.04]
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.01, 0.02]	0.77	.439	0.00	[-0.01, 0.02]
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.02	[0.00, 0.03]	2.73	.006	-0.01	[-0.02, 0.00]
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.04	[-0.10, 0.01]	-1.49	.137	0.00	[-0.06, 0.06]
HRS						
Intercept, $\hat{\gamma}_{00}$	3.41	[3.38, 3.44]	206.26	< .001	3.35	[3.31, 3.38]
Propensity score, $\hat{\gamma}_{02}$	0.08	[0.03, 0.14]	2.86	.004	0.17	[0.11, 0.23]
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.01]	0.31	.754	0.00	[-0.01, 0.01]
After-slope, $\hat{\gamma}_{20}$	-0.01	[-0.02, -0.01]	-4.11	< .001	-0.01	[-0.02, -0.01]
Shift, $\hat{\gamma}_{30}$	0.02	[0.00, 0.04]	1.93	.053	0.00	[-0.02, 0.02]
Grandparent, $\hat{\gamma}_{01}$	0.02	[-0.04, 0.07]	0.60	.547	0.03	[-0.02, 0.08]
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.01	[-0.02, 0.03]	0.55	.580	0.00	[-0.02, 0.03]
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.02	[0.01, 0.04]	3.06	.002	0.02	[0.01, 0.04]
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.05	[-0.09, -0.01]	-2.36	.018	-0.03	[-0.07, 0.01]

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 10

*Linear Contrasts for Conscientiousness.*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.02	4.71	.030	0.01	0.40	.525
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.00	0.01	.928	0.00	0.01	.932
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.03	1.14	.286	-0.01	0.13	.718
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.00	0.20	.655	0.00	0.18	.667
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.00	0.01	.942	0.00	0.01	.943
HRS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.01	0.47	.491	-0.01	2.83	.092
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.02	2.49	.114	-0.02	2.82	.093
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.03	2.96	.085	-0.01	0.54	.462
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.01	0.59	.444	0.01	0.68	.409
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.01	1.88	.170	0.01	2.13	.145

*Note.* The linear contrasts are needed in cases where estimates of interest are represented by multiple fixed-effects coefficients and are computed using the *linearHypothesis* function from the *car* R package (Fox & Weisberg, 2019) based on the models from Table 9.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 11

*Fixed Effects of Conscientiousness Over the Transition to Grandparenthood Moderated by Gender.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	95% CI	t	p
<b>LISS</b>								
Intercept, $\hat{\gamma}_{00}$	3.69	[3.60, 3.77]	87.30	< .001	3.70	[3.61, 3.80]	75.84	< .001
Propensity score, $\hat{\gamma}_{04}$	0.00	[-0.08, 0.07]	-0.03	.976	0.01	[-0.06, 0.08]	0.34	.732
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.01]	0.64	.524	0.00	[-0.01, 0.01]	0.75	.455
After-slope, $\hat{\gamma}_{20}$	-0.01	[-0.02, -0.01]	-3.43	.001	0.00	[0.00, 0.01]	0.71	.477
Shift, $\hat{\gamma}_{30}$	0.04	[0.00, 0.08]	2.16	.031	0.00	[-0.03, 0.04]	0.14	.892
Grandparent, $\hat{\gamma}_{01}$	0.03	[-0.09, 0.16]	0.48	.634	0.01	[-0.13, 0.14]	0.12	.907
Female, $\hat{\gamma}_{02}$	0.16	[0.05, 0.27]	2.88	.004	0.22	[0.09, 0.34]	3.26	.001
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.02, 0.02]	-0.01	.994	0.00	[-0.02, 0.02]	-0.06	.953
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.02	[0.00, 0.04]	2.53	.011	0.01	[-0.01, 0.02]	0.65	.513
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.04	[-0.13, 0.04]	-1.07	.286	-0.01	[-0.09, 0.08]	-0.14	.886
Before-slope * Female, $\hat{\gamma}_{12}$	-0.01	[-0.02, 0.00]	-1.61	.108	-0.01	[-0.02, 0.00]	-1.23	.218
After-slope * Female, $\hat{\gamma}_{22}$	-0.01	[-0.02, 0.00]	-1.11	.268	0.01	[0.00, 0.02]	2.38	.017
Shift * Female, $\hat{\gamma}_{32}$	0.00	[-0.05, 0.05]	-0.04	.970	-0.01	[-0.06, 0.04]	-0.41	.683
Grandparent * Female, $\hat{\gamma}_{03}$	-0.07	[-0.24, 0.10]	-0.81	.418	-0.12	[-0.30, 0.06]	-1.30	.193
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	0.01	[-0.02, 0.03]	0.61	.542	0.01	[-0.02, 0.03]	0.44	.663
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	-0.01	[-0.03, 0.01]	-0.84	.403	-0.03	[-0.05, 0.00]	-2.37	.018
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.01	[-0.11, 0.12]	0.11	.916	0.02	[-0.10, 0.13]	0.27	.787
<b>HRS</b>								
Intercept, $\hat{\gamma}_{00}$	3.35	[3.30, 3.39]	143.72	< .001	3.26	[3.21, 3.31]	124.79	< .001
Propensity score, $\hat{\gamma}_{04}$	0.09	[0.03, 0.14]	3.00	.003	0.17	[0.11, 0.23]	5.65	< .001
Before-slope, $\hat{\gamma}_{10}$	0.01	[-0.01, 0.02]	1.19	.234	0.01	[0.00, 0.03]	2.08	.037
After-slope, $\hat{\gamma}_{20}$	-0.01	[-0.02, 0.00]	-2.42	.016	0.00	[-0.01, 0.01]	-0.10	.920
Shift, $\hat{\gamma}_{30}$	0.02	[-0.01, 0.05]	1.18	.237	-0.01	[-0.04, 0.02]	-0.74	.462
Grandparent, $\hat{\gamma}_{01}$	-0.03	[-0.10, 0.05]	-0.74	.461	0.01	[-0.07, 0.09]	0.28	.780
Female, $\hat{\gamma}_{02}$	0.11	[0.05, 0.17]	3.81	< .001	0.15	[0.09, 0.22]	4.67	< .001
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.01	[-0.02, 0.05]	0.74	.460	0.01	[-0.03, 0.04]	0.45	.651
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.03	[0.01, 0.05]	2.64	.008	0.02	[0.00, 0.04]	1.71	.088
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.08	[-0.15, -0.02]	-2.57	.010	-0.06	[-0.12, 0.00]	-1.85	.064
Before-slope * Female, $\hat{\gamma}_{12}$	-0.01	[-0.03, 0.01]	-1.34	.180	-0.02	[-0.04, 0.00]	-2.16	.031
After-slope * Female, $\hat{\gamma}_{22}$	0.00	[-0.02, 0.01]	-0.39	.695	-0.02	[-0.03, -0.01]	-3.05	.002
Shift * Female, $\hat{\gamma}_{32}$	0.00	[-0.04, 0.04]	0.13	.895	0.02	[-0.02, 0.05]	0.92	.356

Table 11 continued

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI	$t$	$p$
Grandparent * Female, $\hat{\gamma}_{03}$	0.08	[-0.02, 0.18]	1.64	.101	0.03	[-0.07, 0.13]	0.62	.538
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	-0.01	[-0.06, 0.03]	-0.47	.637	0.00	[-0.05, 0.04]	-0.21	.836
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	-0.01	[-0.04, 0.02]	-0.79	.428	0.00	[-0.02, 0.03]	0.29	.770
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.06	[-0.03, 0.14]	1.34	.181	0.05	[-0.04, 0.13]	1.11	.269

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.



Table 12

*Linear Contrasts for Conscientiousness (Moderated by Gender).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.03	2.83	.092	0.01	0.10	.750
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.02	1.93	.165	0.01	0.22	.640
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.00	0.02	.883	0.00	0.02	.886
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.01	0.04	.849	-0.01	0.03	.857
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.02	0.40	.528	0.00	0.00	.991
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.01	0.81	.368	0.01	0.34	.560
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.01	2.25	.133	-0.02	7.67	.006
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.03	0.64	.422	-0.01	0.14	.709
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.01	0.09	.763	0.00	0.01	.930
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.00	0.02	.901	0.00	0.02	.899
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.02	2.25	.134	-0.02	2.12	.146
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.01	0.06	.812	-0.01	0.05	.820
HRS						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.01	0.21	.648	-0.01	1.00	.317
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.01	0.26	.609	-0.01	1.95	.163
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.05	4.94	.026	-0.05	5.72	.017
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.00	0.01	.906	0.00	0.01	.912
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.05	4.78	.029	-0.04	2.75	.097
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.00	0.02	.900	0.00	0.04	.839
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.02	2.96	.085	0.02	5.42	.020
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.01	0.11	.737	0.01	0.27	.600
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.00	0.00	.998	0.00	0.02	.877
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	-0.02	1.36	.244	-0.03	1.58	.208
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.01	1.17	.279	-0.02	1.43	.232
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.05	2.47	.116	0.05	2.90	.089

*Note.* The linear contrasts are based on the models from Table 11.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 13

*Fixed Effects of Conscientiousness Over the Transition to Grandparenthood Moderated by Performing Paid Work.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	95% CI
Intercept, $\hat{\gamma}_{00}$	3.41	[3.37, 3.45]	165.13	< .001	3.37	[3.33, 3.42]
Propensity score, $\hat{\gamma}_{04}$	0.06	[0.00, 0.12]	2.13	.033	0.14	[0.09, 0.20]
Before-slope, $\hat{\gamma}_{10}$	-0.01	[-0.03, 0.00]	-1.55	.121	0.00	[-0.02, 0.02]
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.03, -0.01]	-3.55	< .001	-0.02	[-0.03, -0.01]
Shift, $\hat{\gamma}_{30}$	0.02	[-0.01, 0.05]	1.49	.137	-0.02	[-0.05, 0.01]
Grandparent, $\hat{\gamma}_{01}$	-0.09	[-0.18, -0.01]	-2.19	.029	-0.10	[-0.18, -0.01]
Working, $\hat{\gamma}_{02}$	0.01	[-0.03, 0.05]	0.45	.650	-0.03	[-0.06, 0.01]
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.08	[0.04, 0.13]	3.54	< .001	0.07	[0.03, 0.12]
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.03	[0.01, 0.05]	2.66	.008	0.03	[0.01, 0.05]
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.09	[-0.16, -0.02]	-2.64	.008	-0.05	[-0.11, 0.02]
Before-slope * Working, $\hat{\gamma}_{12}$	0.02	[0.00, 0.05]	2.21	.027	0.01	[-0.01, 0.03]
After-slope * Working, $\hat{\gamma}_{22}$	0.01	[0.00, 0.03]	1.92	.055	0.02	[0.01, 0.03]
Shift * Working, $\hat{\gamma}_{32}$	-0.01	[-0.05, 0.03]	-0.45	.653	0.03	[-0.01, 0.06]
Grandparent * Working, $\hat{\gamma}_{03}$	0.14	[0.05, 0.23]	3.16	.002	0.17	[0.09, 0.26]
Before-slope * Grandparent * Working, $\hat{\gamma}_{13}$	-0.10	[-0.16, -0.05]	-3.69	< .001	-0.09	[-0.14, -0.04]
After-slope * Grandparent * Working, $\hat{\gamma}_{23}$	-0.01	[-0.04, 0.02]	-0.76	.449	-0.02	[-0.05, 0.01]
Shift * Grandparent * Working, $\hat{\gamma}_{33}$	0.06	[-0.03, 0.15]	1.31	.191	0.02	[-0.06, 0.11]

*Note.* Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *working* = 1 indicates being employed in paid work.

Table 14

*Linear Contrasts for Conscientiousness (Moderated by Paid Work; only HRS).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
Shift of not-working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.01	0.23	.635	-0.04	9.72	.002
Shift of working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.01	1.06	.304	0.00	0.28	.598
Shift of not-working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.06	5.20	.023	-0.06	5.93	.015
Shift of working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.01	0.09	.768	-0.01	0.13	.717
Shift of not-working controls vs. not-working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.06	5.09	.024	-0.02	0.46	.498
Before-slope of working controls vs. working grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	-0.02	1.75	.185	-0.02	1.50	.221
After-slope of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.02	2.59	.107	0.01	1.83	.176
Shift of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.02	0.52	.469	-0.01	0.31	.578
Shift of not-working controls vs. working controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.00	0.06	.809	0.04	8.10	.004
Before-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	-0.08	9.38	.002	-0.08	10.44	.001
After-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.00	0.01	.920	0.00	0.02	.879
Shift of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.05	2.62	.106	0.05	2.89	.089

*Note.* The linear contrasts are based on the models from Table 13.  $\hat{\gamma}_c$  = combined fixed-effects estimate.



Table 16

*Linear Contrasts for Conscientiousness (Moderated by Grandchild Care; only HRS).*

Linear Contrast	Parent controls		Nonparent controls	
	$\hat{\gamma}_c$	$\chi^2$	$\hat{\gamma}_c$	$\chi^2$
After-slope of caring controls vs. caring grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.04	13.75	0.05	19.49
After-slope of not-caring grandparents vs. caring grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.03	4.48	0.03	5.28

*Note.* The linear contrasts are based on the models from Table 15.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 17

*Fixed Effects of Extraversion Over the Transition to Grandparenthood.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	95% CI
LISS						
Intercept, $\hat{\gamma}_{00}$	3.25	[3.18, 3.33]	87.65	< .001	3.29	[3.20, 3.39]
Propensity score, $\hat{\gamma}_{02}$	-0.01	[-0.10, 0.07]	-0.26	.793	0.01	[-0.07, 0.08]
Before-slope, $\hat{\gamma}_{10}$	-0.01	[-0.01, 0.00]	-1.77	.077	0.00	[0.00, 0.01]
After-slope, $\hat{\gamma}_{20}$	0.00	[-0.01, 0.00]	-1.47	.141	-0.01	[-0.02, 0.00]
Shift, $\hat{\gamma}_{30}$	-0.01	[-0.04, 0.01]	-0.97	.332	-0.01	[-0.03, 0.02]
Grandparent, $\hat{\gamma}_{01}$	0.06	[-0.05, 0.17]	1.03	.306	0.01	[-0.12, 0.14]
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.02, 0.01]	-0.40	.690	-0.01	[-0.02, 0.00]
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.00	[-0.01, 0.02]	0.57	.569	0.01	[0.00, 0.02]
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.02	[-0.08, 0.05]	-0.51	.607	-0.02	[-0.08, 0.04]
HRS						
Intercept, $\hat{\gamma}_{00}$	3.20	[3.16, 3.24]	159.82	< .001	3.11	[3.07, 3.16]
Propensity score, $\hat{\gamma}_{02}$	0.02	[-0.05, 0.08]	0.56	.577	0.05	[-0.02, 0.12]
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.01]	-0.52	.604	0.01	[-0.01, 0.02]
After-slope, $\hat{\gamma}_{20}$	0.00	[-0.01, 0.01]	-0.64	.520	0.00	[-0.01, 0.01]
Shift, $\hat{\gamma}_{30}$	0.02	[0.00, 0.04]	1.68	.093	0.01	[-0.01, 0.03]
Grandparent, $\hat{\gamma}_{01}$	0.00	[-0.06, 0.06]	0.05	.957	0.07	[0.01, 0.14]
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.02, 0.03]	0.31	.757	0.00	[-0.03, 0.02]
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.01	[0.00, 0.03]	1.46	.143	0.01	[0.00, 0.03]
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.04	[-0.09, 0.01]	-1.55	.121	-0.03	[-0.08, 0.02]

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 18  
*Linear Contrasts for Extraversion.*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	-0.02	2.12	.145	-0.02	1.73	.188
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.03	1.58	.208	-0.03	1.47	.225
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.01	0.21	.647	-0.01	0.25	.620
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	-0.01	1.77	.183	-0.01	1.65	.200
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.00	0.01	.912	0.00	0.03	.852
HRS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.02	3.63	.057	0.01	1.51	.219
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.01	0.34	.561	-0.01	0.36	.548
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.03	1.90	.168	-0.02	1.19	.275
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.00	0.01	.925	0.00	0.01	.929
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.01	1.73	.189	0.01	1.86	.173

*Note.* The linear contrasts are needed in cases where estimates of interest are represented by multiple fixed-effects coefficients and are computed using the *linearHypothesis* function from the *car* R package (Fox & Weisberg, 2019) based on the models from Table 17.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 19

*Fixed Effects of Extraversion Over the Transition to Grandparenthood Moderated by Gender.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	$\hat{\gamma}$	95% CI	t
<b>LISS</b>						
Intercept, $\hat{\gamma}_{00}$	3.28	[3.18, 3.39]	60.26	3.22	[3.08, 3.35]	46.79
Propensity score, $\hat{\gamma}_{04}$	-0.01	[-0.09, 0.08]	-0.15	0.01	[-0.06, 0.09]	0.30
Before-slope, $\hat{\gamma}_{10}$	-0.01	[-0.02, 0.00]	-1.82	0.02	[0.01, 0.03]	4.00
After-slope, $\hat{\gamma}_{20}$	-0.01	[-0.02, 0.00]	-2.56	0.00	[-0.01, 0.00]	-1.08
Shift, $\hat{\gamma}_{30}$	-0.04	[-0.08, 0.01]	-1.68	-0.05	[-0.09, -0.01]	-2.43
Grandparent, $\hat{\gamma}_{01}$	0.01	[-0.15, 0.17]	0.09	0.07	[-0.11, 0.26]	0.78
Female, $\hat{\gamma}_{02}$	-0.06	[-0.20, 0.09]	-0.78	0.13	[-0.05, 0.31]	1.45
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.02, 0.02]	0.14	-0.03	[-0.05, -0.01]	-2.49
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.01	[-0.01, 0.03]	1.19	0.00	[-0.01, 0.02]	0.48
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.01	[-0.10, 0.08]	-0.12	0.01	[-0.08, 0.10]	0.22
Before-slope * Female, $\hat{\gamma}_{12}$	0.01	[-0.01, 0.02]	0.87	-0.03	[-0.04, -0.02]	-4.83
After-slope * Female, $\hat{\gamma}_{22}$	0.01	[0.00, 0.02]	2.10	-0.01	[-0.02, 0.00]	-2.03
Shift * Female, $\hat{\gamma}_{32}$	0.04	[-0.02, 0.09]	1.36	0.08	[0.03, 0.14]	2.91
Grandparent * Female, $\hat{\gamma}_{03}$	0.09	[-0.13, 0.31]	0.82	-0.11	[-0.36, 0.13]	-0.90
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	-0.01	[-0.04, 0.02]	-0.53	0.03	[0.00, 0.06]	2.09
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	-0.01	[-0.04, 0.01]	-1.11	0.01	[-0.02, 0.03]	0.71
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	-0.02	[-0.14, 0.10]	-0.29	-0.06	[-0.18, 0.06]	-0.98
<b>HRS</b>						
Intercept, $\hat{\gamma}_{00}$	3.15	[3.09, 3.21]	108.70	3.11	[3.04, 3.17]	96.32
Propensity score, $\hat{\gamma}_{04}$	0.02	[-0.04, 0.09]	0.64	0.05	[-0.02, 0.12]	1.31
Before-slope, $\hat{\gamma}_{10}$	0.01	[-0.01, 0.02]	0.70	0.00	[-0.02, 0.01]	-0.37
After-slope, $\hat{\gamma}_{20}$	0.01	[0.00, 0.02]	2.05	0.00	[-0.01, 0.01]	0.51
Shift, $\hat{\gamma}_{30}$	-0.01	[-0.04, 0.02]	-0.52	-0.01	[-0.04, 0.03]	-0.41
Grandparent, $\hat{\gamma}_{01}$	-0.01	[-0.10, 0.08]	-0.28	0.02	[-0.08, 0.11]	0.39
Female, $\hat{\gamma}_{02}$	0.08	[0.01, 0.16]	2.24	0.01	[-0.07, 0.09]	0.30
Before-slope * Grandparent, $\hat{\gamma}_{11}$	-0.02	[-0.06, 0.02]	-0.85	-0.01	[-0.05, 0.03]	-0.41
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.00	[-0.02, 0.03]	0.35	0.01	[-0.01, 0.04]	1.09
Shift * Grandparent, $\hat{\gamma}_{31}$	0.00	[-0.08, 0.07]	-0.12	-0.01	[-0.08, 0.06]	-0.19
Before-slope * Female, $\hat{\gamma}_{12}$	-0.02	[-0.04, 0.01]	-1.44	0.02	[-0.01, 0.04]	1.40
After-slope * Female, $\hat{\gamma}_{22}$	-0.03	[-0.04, -0.01]	-3.28	-0.01	[-0.02, 0.01]	-0.98
Shift * Female, $\hat{\gamma}_{32}$	0.05	[0.00, 0.09]	2.17	0.03	[-0.01, 0.07]	1.45



Table 19 continued

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI
Grandparent * Female, $\hat{\gamma}_{03}$	0.03	[-0.09, 0.15]	0.45	.649	0.10	[-0.03, 0.22]
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	0.04	[-0.01, 0.09]	1.42	.155	0.01	[-0.05, 0.06]
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	0.01	[-0.02, 0.05]	0.79	.431	0.00	[-0.04, 0.03]
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	-0.06	[-0.16, 0.04]	-1.19	.234	-0.04	[-0.14, 0.05]

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 20

*Linear Contrasts for Extraversion (Moderated by Gender).*

Linear Contrast	Parent controls		Nonparent controls	
	$\hat{\gamma}_c$	$\chi^2$	$\hat{\gamma}_c$	$\chi^2$
<b>LISS</b>				
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	-0.05	6.28	.012	9.10
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.01	0.09	.763	0.95
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.04	1.25	.264	1.16
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.02	0.45	.500	0.41
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.01	0.02	.891	0.13
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	-0.01	0.42	.518	0.13
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.00	0.13	.722	0.01
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.03	0.54	.461	1.03
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.05	4.20	.040	8.22
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.00	0.03	.871	0.01
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.00	0.03	.857	0.04
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.02	0.14	.709	0.13
<b>HRS</b>				
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.00	0.06	.812	0.09
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.03	5.44	.020	3.52
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.00	0.01	.905	0.01
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.02	0.73	.393	0.78
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.00	0.00	.999	0.01
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.02	1.42	.234	0.01
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.02	2.40	.122	0.01
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.05	3.28	.070	2.65
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.02	1.88	.171	2.10
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.02	0.79	.373	0.85
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.01	0.57	.452	0.62
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.02	0.44	.508	0.47

*Note.* The linear contrasts are based on the models from Table 19.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 21

*Fixed Effects of Extraversion Over the Transition to Grandparenthood Moderated by Performing Paid Work.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI	$t$	$p$
Intercept, $\hat{\gamma}_{00}$	3.18	[3.13, 3.23]	129.04	< .001	3.12	[3.07, 3.17]	112.49	< .001
Propensity score, $\hat{\gamma}_{04}$	0.01	[-0.06, 0.08]	0.31	.757	0.03	[-0.04, 0.10]	0.77	.439
Before-slope, $\hat{\gamma}_{10}$	0.02	[0.00, 0.04]	1.69	.091	0.00	[-0.02, 0.02]	0.09	.927
After-slope, $\hat{\gamma}_{20}$	0.00	[-0.01, 0.01]	0.12	.901	-0.01	[-0.02, 0.00]	-1.24	.213
Shift, $\hat{\gamma}_{30}$	-0.04	[-0.08, -0.01]	-2.48	.013	0.02	[-0.02, 0.05]	0.91	.364
Grandparent, $\hat{\gamma}_{01}$	-0.06	[-0.16, 0.04]	-1.23	.217	-0.01	[-0.11, 0.09]	-0.18	.853
Working, $\hat{\gamma}_{02}$	0.03	[-0.02, 0.07]	1.19	.232	0.00	[-0.05, 0.04]	-0.12	.902
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.02	[-0.03, 0.07]	0.74	.460	0.04	[-0.02, 0.09]	1.38	.169
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.02	[0.00, 0.04]	1.65	.099	0.03	[0.00, 0.05]	2.32	.021
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.02	[-0.10, 0.06]	-0.46	.643	-0.08	[-0.16, 0.00]	-2.02	.044
Before-slope * Working, $\hat{\gamma}_{12}$	-0.03	[-0.05, -0.01]	-2.38	.017	0.01	[-0.02, 0.03]	0.59	.556
After-slope * Working, $\hat{\gamma}_{22}$	0.00	[-0.02, 0.01]	-0.19	.848	0.01	[0.00, 0.03]	1.79	.074
Shift * Working, $\hat{\gamma}_{32}$	0.10	[0.05, 0.14]	4.18	< .001	-0.01	[-0.06, 0.04]	-0.43	.667
Grandparent * Working, $\hat{\gamma}_{03}$	0.08	[-0.02, 0.18]	1.53	.126	0.11	[0.01, 0.21]	2.13	.034
Before-slope * Grandparent * Working, $\hat{\gamma}_{13}$	-0.01	[-0.08, 0.05]	-0.46	.646	-0.05	[-0.11, 0.01]	-1.69	.092
After-slope * Grandparent * Working, $\hat{\gamma}_{23}$	-0.01	[-0.05, 0.02]	-0.80	.425	-0.03	[-0.06, 0.00]	-1.69	.090
Shift * Grandparent * Working, $\hat{\gamma}_{33}$	-0.03	[-0.13, 0.08]	-0.49	.623	0.08	[-0.02, 0.18]	1.57	.115

*Note.* Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *working* = 1 indicates being employed in paid work.

Table 22

*Linear Contrasts for Extraversion (Moderated by Paid Work; only HRS).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
Shift of not-working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	-0.04	9.28	.002	0.01	0.42	.515
Shift of working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.05	22.76	<	0.01	1.67	.196
Shift of not-working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.04	2.05	.152	-0.04	2.20	.138
Shift of working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.01	0.40	.526	0.01	0.42	.517
Shift of not-working controls vs. not-working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.00	0.00	.957	-0.05	2.60	.107
Before-slope of working controls vs. working grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.01	0.12	.729	-0.02	1.06	.303
After-slope of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.01	0.28	.598	0.00	0.00	.948
Shift of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.04	2.46	.117	0.00	0.00	.987
Shift of not-working controls vs. working controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.10	27.75	<	0.00	0.04	.852
Before-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	-0.04	2.34	.126	-0.04	2.52	.113
After-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.02	0.97	.325	-0.02	1.01	.314
Shift of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.06	2.24	.135	0.06	2.38	.123

*Note.* The linear contrasts are based on the models from Table 21.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

**Table 23***Fixed Effects of Extraversion Over the Transition to Grandparenthood Moderated by Grandchild Care.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	$\hat{\gamma}$	95% CI	t
Intercept, $\hat{\gamma}_{00}$	3.19	[3.14, 3.24]	128.26	3.12	[3.06, 3.18]	102.87
Propensity score, $\hat{\gamma}_{04}$	0.13	[0.04, 0.22]	2.98	0.08	[-0.01, 0.17]	1.67
After-slope, $\hat{\gamma}_{10}$	-0.01	[-0.03, 0.00]	-2.61	0.00	[-0.01, 0.01]	-0.39
Grandparent, $\hat{\gamma}_{01}$	-0.04	[-0.11, 0.03]	-1.05	0.04	[-0.04, 0.12]	1.06
Caring, $\hat{\gamma}_{02}$	0.00	[-0.03, 0.04]	0.23	0.02	[-0.02, 0.05]	0.86
After-slope * Grandparent, $\hat{\gamma}_{11}$	0.02	[-0.01, 0.04]	1.32	0.00	[-0.02, 0.02]	0.30
After-slope * Caring, $\hat{\gamma}_{12}$	0.00	[-0.02, 0.02]	-0.04	0.00	[-0.02, 0.01]	-0.42
Grandparent * Caring, $\hat{\gamma}_{03}$	-0.04	[-0.13, 0.06]	-0.74	-0.05	[-0.14, 0.04]	-1.04
After-slope * Grandparent * Caring, $\hat{\gamma}_{13}$	0.03	[-0.01, 0.06]	1.56	0.03	[0.00, 0.07]	1.83

*Note.* Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *caring* = 1 indicates more than 100 hours of grandchild care since the last assessment.

Table 24

Linear Contrasts for Extraversion (Moderated by Grandchild Care; only HRS).

Linear Contrast	Parent controls		Nonparent controls	
	$\hat{\gamma}_c$	$\chi^2$	$\hat{\gamma}_c$	$\chi^2$
After-slope of caring controls vs. caring grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.04	10.45	0.04	7.39
After-slope of not-caring grandparents vs. caring grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.03	2.98	0.03	3.37

Note. The linear contrasts are based on the models from Table 23.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 25

*Fixed Effects of Neuroticism Over the Transition to Grandparenthood.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI	$t$	$p$
<b>LISS</b>								
Intercept, $\hat{\gamma}_{00}$	2.48	[2.40, 2.56]	63.09	< .001	2.45	[2.35, 2.54]	51.88	< .001
Propensity score, $\hat{\gamma}_{02}$	0.01	[-0.09, 0.11]	0.19	.852	0.00	[-0.09, 0.09]	0.04	.967
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.01]	-0.56	.575	-0.01	[-0.02, -0.01]	-3.66	< .001
After-slope, $\hat{\gamma}_{20}$	0.00	[0.00, 0.01]	0.94	.350	0.00	[0.00, 0.01]	1.31	.190
Shift, $\hat{\gamma}_{30}$	-0.05	[-0.08, -0.02]	-2.96	.003	-0.03	[-0.06, 0.01]	-1.58	.115
Grandparent, $\hat{\gamma}_{01}$	-0.08	[-0.20, 0.03]	-1.37	.170	-0.04	[-0.17, 0.08]	-0.67	.500
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.01, 0.02]	0.43	.668	0.02	[0.00, 0.03]	1.83	.067
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.00	[-0.02, 0.01]	-0.33	.744	0.00	[-0.02, 0.01]	-0.48	.635
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.02	[-0.09, 0.06]	-0.41	.684	-0.04	[-0.12, 0.04]	-1.01	.312
<b>HRS</b>								
Intercept, $\hat{\gamma}_{00}$	2.07	[2.03, 2.11]	94.42	< .001	2.07	[2.02, 2.12]	79.36	< .001
Propensity score, $\hat{\gamma}_{02}$	0.00	[-0.07, 0.08]	0.12	.902	0.15	[0.07, 0.23]	3.70	< .001
Before-slope, $\hat{\gamma}_{10}$	-0.01	[-0.03, 0.00]	-1.90	.057	-0.03	[-0.04, -0.02]	-4.70	< .001
After-slope, $\hat{\gamma}_{20}$	-0.01	[-0.01, 0.00]	-1.20	.230	-0.01	[-0.02, -0.01]	-3.18	.001
Shift, $\hat{\gamma}_{30}$	0.01	[-0.02, 0.03]	0.42	.675	-0.03	[-0.06, -0.01]	-2.36	.018
Grandparent, $\hat{\gamma}_{01}$	-0.06	[-0.13, 0.01]	-1.64	.100	-0.12	[-0.19, -0.05]	-3.31	.001
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.02	[-0.01, 0.05]	1.28	.201	0.04	[0.01, 0.07]	2.42	.016
After-slope * Grandparent, $\hat{\gamma}_{21}$	-0.02	[-0.04, 0.00]	-1.52	.127	-0.01	[-0.03, 0.01]	-0.80	.424
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.06	[-0.12, 0.00]	-2.12	.034	-0.03	[-0.08, 0.03]	-0.88	.381

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 26

Linear Contrasts for Neuroticism.

Linear Contrast	Parent controls		Nonparent controls			
	$\hat{\gamma}_c$	$\chi^2$	$\hat{\gamma}_c$	$\chi^2$	$p$	
LISS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	-0.05	10.12	.001	-0.02	2.26	.133
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.07	4.99	.025	-0.07	4.74	.029
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.02	0.30	.587	-0.04	1.62	.203
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.00	0.04	.842	0.00	0.05	.830
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.00	0.01	.914	0.00	0.02	.900
HRS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.00	0.00	.993	-0.04	20.02	< .001
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.08	15.10	< .001	-0.08	15.78	< .001
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.08	12.06	.001	-0.03	2.29	.130
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.01	0.25	.618	0.01	0.19	.666
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	-0.02	5.29	.021	-0.02	6.13	.013

Note. The linear contrasts are needed in cases where estimates of interest are represented by multiple fixed-effects coefficients and are computed using the *linearHypothesis* function from the *car* R package (Fox & Weisberg, 2019) based on the models from Table 25.  $\hat{\gamma}_c$  = combined fixed-effects estimate.



Table 27

*Fixed Effects of Neuroticism Over the Transition to Grandparenthood Moderated by Gender.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	95% CI
<b>LISS</b>						
Intercept, $\hat{\gamma}_{00}$	2.45	[2.34, 2.56]	43.45	< .001	2.32	[2.19, 2.45]
Propensity score, $\hat{\gamma}_{04}$	0.02	[-0.09, 0.12]	0.30	.767	0.02	[-0.08, 0.11]
Before-slope, $\hat{\gamma}_{10}$	-0.01	[-0.02, 0.00]	-1.89	.059	-0.01	[-0.02, 0.00]
After-slope, $\hat{\gamma}_{20}$	0.01	[0.00, 0.02]	2.82	.005	0.01	[0.00, 0.02]
Shift, $\hat{\gamma}_{30}$	-0.06	[-0.11, -0.01]	-2.24	.025	-0.05	[-0.10, 0.00]
Grandparent, $\hat{\gamma}_{01}$	-0.18	[-0.35, -0.01]	-2.11	.035	-0.05	[-0.23, 0.13]
Female, $\hat{\gamma}_{02}$	0.05	[-0.09, 0.20]	0.72	.474	0.22	[0.05, 0.40]
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.01	[-0.01, 0.04]	0.82	.413	0.01	[-0.02, 0.03]
After-slope * Grandparent, $\hat{\gamma}_{21}$	-0.02	[-0.04, 0.01]	-1.36	.173	-0.01	[-0.04, 0.01]
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.03	[-0.14, 0.08]	-0.51	.612	-0.04	[-0.15, 0.08]
Before-slope * Female, $\hat{\gamma}_{12}$	0.02	[0.00, 0.03]	2.03	.043	-0.01	[-0.03, 0.00]
After-slope * Female, $\hat{\gamma}_{22}$	-0.02	[-0.03, -0.01]	-2.99	.003	-0.01	[-0.03, 0.00]
Shift * Female, $\hat{\gamma}_{32}$	0.01	[-0.05, 0.08]	0.39	.700	0.04	[-0.03, 0.11]
Grandparent * Female, $\hat{\gamma}_{03}$	0.18	[-0.05, 0.40]	1.54	.123	0.01	[-0.24, 0.25]
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	-0.01	[-0.05, 0.02]	-0.66	.508	0.02	[-0.02, 0.05]
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	0.02	[-0.01, 0.05]	1.48	.138	0.02	[-0.01, 0.05]
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.03	[-0.12, 0.18]	0.35	.730	0.00	[-0.16, 0.15]
<b>HRS</b>						
Intercept, $\hat{\gamma}_{00}$	1.98	[1.91, 2.04]	62.73	< .001	2.01	[1.94, 2.08]
Propensity score, $\hat{\gamma}_{04}$	0.01	[-0.07, 0.09]	0.26	.798	0.15	[0.07, 0.23]
Before-slope, $\hat{\gamma}_{10}$	-0.02	[-0.04, 0.00]	-2.11	.035	-0.03	[-0.05, -0.01]
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.03, 0.00]	-2.40	.017	-0.02	[-0.03, -0.01]
Shift, $\hat{\gamma}_{30}$	0.08	[0.04, 0.12]	4.02	< .001	0.00	[-0.03, 0.04]
Grandparent, $\hat{\gamma}_{01}$	-0.06	[-0.16, 0.04]	-1.10	.272	-0.16	[-0.26, -0.05]
Female, $\hat{\gamma}_{02}$	0.17	[0.09, 0.25]	4.19	< .001	0.10	[0.01, 0.19]
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.06	[0.01, 0.10]	2.26	.024	0.06	[0.02, 0.11]
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.00	[-0.03, 0.03]	0.31	.755	0.01	[-0.02, 0.04]
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.16	[-0.25, -0.07]	-3.60	< .001	-0.08	[-0.17, 0.00]
Before-slope * Female, $\hat{\gamma}_{12}$	0.01	[-0.01, 0.04]	1.04	.300	0.00	[-0.03, 0.03]
After-slope * Female, $\hat{\gamma}_{22}$	0.02	[0.00, 0.04]	2.19	.029	0.01	[-0.01, 0.03]
Shift * Female, $\hat{\gamma}_{32}$	-0.14	[-0.19, -0.08]	-5.02	< .001	-0.06	[-0.11, -0.01]
Intercept, $\hat{\gamma}_{00}$	1.98	[1.91, 2.04]	62.73	< .001	2.01	[1.94, 2.08]
Propensity score, $\hat{\gamma}_{04}$	0.01	[-0.07, 0.09]	0.26	.798	0.15	[0.07, 0.23]
Before-slope, $\hat{\gamma}_{10}$	-0.02	[-0.04, 0.00]	-2.11	.035	-0.03	[-0.05, -0.01]
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.03, 0.00]	-2.40	.017	-0.02	[-0.03, -0.01]
Shift, $\hat{\gamma}_{30}$	0.08	[0.04, 0.12]	4.02	< .001	0.00	[-0.03, 0.04]
Grandparent, $\hat{\gamma}_{01}$	-0.06	[-0.16, 0.04]	-1.10	.272	-0.16	[-0.26, -0.05]
Female, $\hat{\gamma}_{02}$	0.17	[0.09, 0.25]	4.19	< .001	0.10	[0.01, 0.19]
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.06	[0.01, 0.10]	2.26	.024	0.06	[0.02, 0.11]
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.00	[-0.03, 0.03]	0.31	.755	0.01	[-0.02, 0.04]
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.16	[-0.25, -0.07]	-3.60	< .001	-0.08	[-0.17, 0.00]
Before-slope * Female, $\hat{\gamma}_{12}$	0.01	[-0.01, 0.04]	1.04	.300	0.00	[-0.03, 0.03]
After-slope * Female, $\hat{\gamma}_{22}$	0.02	[0.00, 0.04]	2.19	.029	0.01	[-0.01, 0.03]
Shift * Female, $\hat{\gamma}_{32}$	-0.14	[-0.19, -0.08]	-5.02	< .001	-0.06	[-0.11, -0.01]

Table 27 continued

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	p
Grandparent * Female, $\hat{\gamma}_{03}$	0.00	[-0.14, 0.13]	-0.01	.993	0.06	0.82
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	-0.06	[-0.12, 0.00]	-1.85	.065	-0.05	-1.49
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	-0.04	[-0.08, 0.00]	-1.80	.073	-0.03	-1.35
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.17	[0.06, 0.29]	2.90	.004	0.10	1.71
						.087

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 28

*Linear Contrasts for Neuroticism (Moderated by Gender).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	-0.04	3.64	.056	-0.04	2.76	.096
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.05	6.02	.014	-0.01	0.24	.621
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.09	3.89	.048	-0.09	3.67	.055
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.04	1.25	.263	-0.05	1.20	.273
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.04	0.80	.371	-0.05	0.97	.325
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.00	0.01	.935	0.03	4.48	.034
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.01	0.51	.476	0.00	0.12	.730
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.01	0.01	.904	-0.03	0.57	.451
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.01	0.06	.799	0.03	0.76	.382
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.00	0.08	.783	0.00	0.09	.765
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.00	0.02	.882	0.00	0.02	.875
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.04	0.50	.481	0.04	0.46	.498
HRS						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.06	17.37	< .001	-0.02	1.08	.299
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.05	13.66	< .001	-0.07	25.37	< .001
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.09	9.12	.003	-0.09	9.50	.002
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.07	6.49	.011	-0.07	6.77	.009
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.16	20.99	< .001	-0.07	5.10	.024
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.00	0.05	.821	0.02	0.73	.392
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	-0.03	5.41	.020	-0.02	2.20	.138
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.02	0.37	.541	0.00	0.01	.943
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.12	31.04	< .001	-0.05	6.32	.012
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	-0.05	2.41	.120	-0.05	2.56	.109
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.02	0.84	.360	-0.02	0.88	.349
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.02	0.30	.584	0.02	0.31	.577

*Note.* The linear contrasts are based on the models from Table 27.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 29

Fixed Effects of Neuroticism Over the Transition to Grandparenthood Moderated by Performing Paid Work.

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	$\hat{\gamma}$	95% CI	t
Intercept, $\hat{\gamma}_{00}$	2.02	[1.96, 2.07]	72.21	2.02	[1.96, 2.08]	63.73
Propensity score, $\hat{\gamma}_{04}$	0.00	[-0.08, 0.08]	0.01	0.15	[0.06, 0.23]	3.46
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.02, 0.03]	0.18	-0.01	[-0.04, 0.02]	-0.84
After-slope, $\hat{\gamma}_{20}$	-0.01	[-0.02, 0.01]	-0.79	-0.01	[-0.02, 0.00]	-1.41
Shift, $\hat{\gamma}_{30}$	0.04	[0.00, 0.08]	1.91	-0.03	[-0.07, 0.01]	-1.32
Grandparent, $\hat{\gamma}_{01}$	0.13	[0.02, 0.25]	2.28	0.07	[-0.04, 0.19]	1.27
Working, $\hat{\gamma}_{02}$	0.08	[0.03, 0.13]	2.94	0.07	[0.02, 0.12]	2.63
Before-slope * Grandparent, $\hat{\gamma}_{11}$	-0.07	[-0.13, 0.00]	-2.04	-0.06	[-0.12, 0.01]	-1.73
After-slope * Grandparent, $\hat{\gamma}_{21}$	-0.02	[-0.05, 0.01]	-1.55	-0.02	[-0.05, 0.01]	-1.37
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.05	[-0.15, 0.05]	-1.03	0.02	[-0.07, 0.11]	0.45
Before-slope * Working, $\hat{\gamma}_{12}$	-0.02	[-0.05, 0.01]	-1.43	-0.02	[-0.05, 0.01]	-1.54
After-slope * Working, $\hat{\gamma}_{22}$	0.00	[-0.02, 0.02]	-0.23	-0.01	[-0.02, 0.01]	-0.73
Shift * Working, $\hat{\gamma}_{32}$	-0.05	[-0.11, 0.00]	-1.90	0.00	[-0.05, 0.06]	0.13
Grandparent * Working, $\hat{\gamma}_{03}$	-0.25	[-0.38, -0.13]	-4.08	-0.25	[-0.37, -0.13]	-4.20
Before-slope * Grandparent * Working, $\hat{\gamma}_{13}$	0.11	[0.04, 0.19]	2.95	0.12	[0.04, 0.19]	3.13
After-slope * Grandparent * Working, $\hat{\gamma}_{23}$	0.01	[-0.03, 0.05]	0.51	0.02	[-0.02, 0.06]	0.75
Shift * Grandparent * Working, $\hat{\gamma}_{33}$	-0.02	[-0.15, 0.10]	-0.33	-0.08	[-0.20, 0.04]	-1.23
						.217

Note. Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *working* = 1 indicates being employed in paid work.

**Table 30***Linear Contrasts for Neuroticism (Moderated by Paid Work; only HRS).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	<i>p</i>	$\hat{\gamma}_c$	$\chi^2$	<i>p</i>
Shift of not-working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.04	4.30	.038	-0.04	4.61	.032
Shift of working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.02	2.18	.140	-0.04	11.64	.001
Shift of not-working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.04	1.12	.290	-0.04	1.24	.266
Shift of working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.10	15.38	< .001	-0.10	16.09	< .001
Shift of not-working controls vs. not-working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.07	3.47	.063	0.00	0.00	.974
Before-slope of working controls vs. working grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.05	5.89	.015	0.06	11.29	.001
After-slope of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	-0.01	0.72	.396	0.00	0.11	.743
Shift of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.08	8.11	.004	-0.06	4.48	.034
Shift of not-working controls vs. working controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.06	6.36	.012	0.00	0.02	.895
Before-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.09	6.73	.009	0.09	7.45	.006
After-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.01	0.20	.651	0.01	0.23	.634
Shift of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.07	2.14	.143	-0.06	2.17	.141

*Note.* The linear contrasts are based on the models from Table 29.  $\hat{\gamma}_c$  = combined fixed-effects estimate.



**Table 32**  
*Linear Contrasts for Neuroticism (Moderated by Grandchild Care; only HRS).*

Linear Contrast	Parent controls		Nonparent controls	
	$\hat{\gamma}_c$	$\chi^2$	$\hat{\gamma}_c$	$\chi^2$
After-slope of caring controls vs. caring grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	-0.03	3.78	.052	3.60
After-slope of not-caring grandparents vs. caring grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	-0.04	4.06	.044	3.90

*Note.* The linear contrasts are based on the models from Table 31.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 33

*Fixed Effects of Openness Over the Transition to Grandparenthood.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI	$t$	$p$
LISS								
Intercept, $\hat{\gamma}_{00}$	3.48	[3.42, 3.53]	118.77	< .001	3.52	[3.45, 3.59]	104.18	< .001
Propensity score, $\hat{\gamma}_{02}$	0.00	[-0.08, 0.07]	-0.07	.944	0.03	[-0.03, 0.09]	1.02	.309
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.00]	-1.58	.114	0.00	[-0.01, 0.00]	-0.68	.494
After-slope, $\hat{\gamma}_{20}$	-0.01	[-0.01, 0.00]	-2.36	.018	0.00	[0.00, 0.01]	1.95	.051
Shift, $\hat{\gamma}_{30}$	0.02	[0.00, 0.05]	1.88	.061	0.00	[-0.02, 0.02]	0.00	.998
Grandparent, $\hat{\gamma}_{01}$	0.01	[-0.08, 0.09]	0.16	.872	-0.05	[-0.14, 0.04]	-1.06	.290
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.01	[0.00, 0.02]	1.23	.220	0.01	[-0.01, 0.02]	0.87	.384
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.00	[-0.01, 0.01]	0.11	.910	-0.01	[-0.02, 0.00]	-1.92	.055
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.03	[-0.08, 0.03]	-1.05	.296	-0.01	[-0.06, 0.04]	-0.21	.832
HRS								
Intercept, $\hat{\gamma}_{00}$	3.04	[3.00, 3.08]	149.49	< .001	3.01	[2.96, 3.06]	129.29	< .001
Propensity score, $\hat{\gamma}_{02}$	0.03	[-0.04, 0.09]	0.82	.411	0.00	[-0.06, 0.07]	0.13	.895
Before-slope, $\hat{\gamma}_{10}$	-0.02	[-0.03, -0.01]	-3.29	.001	0.00	[-0.01, 0.01]	-0.68	.495
After-slope, $\hat{\gamma}_{20}$	-0.02	[-0.03, -0.01]	-5.28	< .001	-0.02	[-0.02, -0.01]	-4.83	< .001
Shift, $\hat{\gamma}_{30}$	0.06	[0.03, 0.08]	4.92	< .001	0.03	[0.01, 0.05]	3.26	.001
Grandparent, $\hat{\gamma}_{01}$	-0.02	[-0.08, 0.05]	-0.55	.582	0.02	[-0.04, 0.09]	0.75	.451
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.02	[-0.01, 0.04]	1.36	.172	0.00	[-0.02, 0.03]	0.19	.850
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.02	[0.00, 0.03]	2.01	.044	0.01	[0.00, 0.03]	1.74	.083
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.07	[-0.12, -0.02]	-2.86	.004	-0.05	[-0.09, 0.00]	-2.16	.031

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.



Table 34

*Linear Contrasts for Openness.*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.02	2.57	.109	0.00	0.21	.650
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.01	0.25	.618	-0.01	0.30	.585
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.03	1.38	.241	-0.02	0.48	.489
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.00	0.34	.561	0.00	0.40	.528
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	-0.01	1.15	.284	-0.01	1.36	.244
HRS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.03	16.48	< .001	0.02	4.36	.037
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.02	1.31	.253	-0.02	1.57	.210
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.05	8.14	.004	-0.04	4.25	.039
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.00	0.00	.946	0.00	0.01	.908
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.00	0.14	.709	0.00	0.20	.658

*Note.* The linear contrasts are needed in cases where estimates of interest are represented by

multiple fixed-effects coefficients and are computed using the *linearHypothesis* function from the

*car* R package (Fox & Weisberg, 2019) based on the models from Table 33.  $\hat{\gamma}_c$  = combined

fixed-effects estimate.

Table 35

*Fixed Effects of Openness Over the Transition to Grandparenthood Moderated by Gender.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	$\hat{\gamma}$	95% CI	t
<b>LISS</b>						
Intercept, $\hat{\gamma}_{00}$	3.47	[3.39, 3.55]	81.39	3.54	[3.45, 3.64]	73.02
Propensity score, $\hat{\gamma}_{04}$	0.00	[-0.08, 0.07]	-0.04	0.03	[-0.03, 0.09]	0.94
Before-slope, $\hat{\gamma}_{10}$	0.00	[-0.01, 0.01]	0.17	0.01	[0.00, 0.02]	2.39
After-slope, $\hat{\gamma}_{20}$	0.00	[-0.01, 0.00]	-1.05	0.01	[0.00, 0.01]	1.53
Shift, $\hat{\gamma}_{30}$	-0.02	[-0.05, 0.02]	-0.93	-0.01	[-0.04, 0.02]	-0.64
Grandparent, $\hat{\gamma}_{01}$	0.11	[-0.01, 0.24]	1.78	0.03	[-0.10, 0.16]	0.44
Female, $\hat{\gamma}_{02}$	0.01	[-0.10, 0.12]	0.16	-0.05	[-0.17, 0.08]	-0.69
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.02, 0.01]	-0.39	-0.01	[-0.03, 0.00]	-1.42
After-slope * Grandparent, $\hat{\gamma}_{21}$	-0.01	[-0.02, 0.01]	-0.88	-0.02	[-0.03, 0.00]	-2.16
Shift * Grandparent, $\hat{\gamma}_{31}$	0.03	[-0.05, 0.12]	0.84	0.03	[-0.05, 0.10]	0.75
Before-slope * Female, $\hat{\gamma}_{12}$	-0.01	[-0.02, 0.00]	-1.64	-0.02	[-0.03, -0.01]	-3.89
After-slope * Female, $\hat{\gamma}_{22}$	0.00	[-0.01, 0.01]	-0.79	0.00	[-0.01, 0.01]	-0.24
Shift * Female, $\hat{\gamma}_{32}$	0.08	[0.03, 0.13]	2.98	0.02	[-0.03, 0.06]	0.84
Grandparent * Female, $\hat{\gamma}_{03}$	-0.20	[-0.37, -0.03]	-2.31	-0.15	[-0.33, 0.03]	-1.59
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	0.02	[0.00, 0.05]	1.70	0.03	[0.01, 0.06]	2.80
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	0.01	[-0.01, 0.04]	1.29	0.01	[-0.01, 0.03]	1.14
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	-0.12	[-0.23, -0.01]	-2.11	-0.06	[-0.16, 0.04]	-1.21
<b>HRS</b>						
Intercept, $\hat{\gamma}_{00}$	3.06	[3.00, 3.12]	108.70	3.03	[2.97, 3.09]	97.90
Propensity score, $\hat{\gamma}_{04}$	0.03	[-0.04, 0.09]	0.86	0.00	[-0.06, 0.07]	0.03
Before-slope, $\hat{\gamma}_{10}$	-0.02	[-0.04, 0.00]	-2.44	-0.01	[-0.03, 0.00]	-1.90
After-slope, $\hat{\gamma}_{20}$	-0.03	[-0.04, -0.02]	-5.75	-0.01	[-0.02, 0.00]	-2.04
Shift, $\hat{\gamma}_{30}$	0.11	[0.07, 0.14]	6.34	0.00	[-0.03, 0.03]	-0.29
Grandparent, $\hat{\gamma}_{01}$	-0.03	[-0.12, 0.06]	-0.62	0.01	[-0.08, 0.10]	0.24
Female, $\hat{\gamma}_{02}$	-0.03	[-0.09, 0.04]	-0.80	-0.04	[-0.11, 0.04]	-0.98
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.01	[-0.03, 0.05]	0.41	0.00	[-0.03, 0.04]	0.05
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.03	[0.01, 0.06]	2.66	0.01	[-0.01, 0.03]	0.94
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.15	[-0.22, -0.07]	-3.93	-0.03	[-0.10, 0.03]	-1.00
Before-slope * Female, $\hat{\gamma}_{12}$	0.00	[-0.02, 0.03]	0.28	0.02	[0.00, 0.04]	1.97
After-slope * Female, $\hat{\gamma}_{22}$	0.02	[0.01, 0.04]	3.05	-0.01	[-0.02, 0.00]	-1.47
Shift * Female, $\hat{\gamma}_{32}$	-0.09	[-0.14, -0.05]	-4.11	0.06	[0.03, 0.10]	3.21

Table 35 continued

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI
Grandparent * Female, $\hat{\gamma}_{03}$	0.02	[-0.10, 0.13]	0.30	.763	0.03	[-0.09, 0.14]
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	0.02	[-0.04, 0.07]	0.67	.504	0.00	[-0.05, 0.05]
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	-0.03	[-0.06, 0.00]	-1.75	.079	0.00	[-0.03, 0.03]
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.14	[0.04, 0.23]	2.71	.007	-0.02	[-0.11, 0.06]

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 36

*Linear Contrasts for Openness (Moderated by Gender).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	-0.02	1.70	.192	-0.01	0.14	.706
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.05	11.29	.001	0.01	0.84	.359
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.01	0.03	.853	0.01	0.04	.833
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.03	0.78	.378	-0.03	0.93	.335
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.03	0.57	.450	0.01	0.13	.721
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.02	4.38	.036	0.02	6.74	.009
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.01	0.91	.341	0.00	0.42	.517
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.08	5.37	.020	-0.04	1.63	.202
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.07	10.45	.001	0.02	0.82	.366
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.01	1.16	.282	0.01	1.41	.236
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.01	1.10	.294	0.01	1.33	.249
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.03	0.53	.466	-0.03	0.65	.421
HRS						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.07	32.25	< .001	-0.02	1.67	.197
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.00	0.15	.698	0.04	15.02	< .001
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.04	2.39	.122	-0.04	2.82	.093
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.00	0.01	.919	0.00	0.02	.899
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.11	15.71	< .001	-0.02	0.80	.372
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.03	2.17	.141	0.00	0.03	.863
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.00	0.10	.747	0.01	2.08	.150
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.01	0.07	.791	-0.04	3.38	.066
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.07	15.92	< .001	0.05	12.31	< .001
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.02	0.76	.382	0.02	1.04	.307
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.01	0.19	.660	-0.01	0.19	.663
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.04	1.17	.280	0.04	1.35	.245

*Note.* The linear contrasts are based on the models from Table 35.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 37

*Fixed Effects of Openness Over the Transition to Grandparenthood Moderated by Performing Paid Work.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	$\hat{\gamma}$	95% CI	t
Intercept, $\hat{\gamma}_{00}$	3.02	[2.97, 3.06]	121.17	3.03	[2.97, 3.08]	111.81
Propensity score, $\hat{\gamma}_{04}$	0.01	[-0.06, 0.07]	0.25	-0.01	[-0.08, 0.05]	-0.39
Before-slope, $\hat{\gamma}_{10}$	-0.01	[-0.03, 0.01]	-1.03	-0.01	[-0.03, 0.01]	-0.96
After-slope, $\hat{\gamma}_{20}$	-0.03	[-0.04, -0.02]	-5.25	-0.02	[-0.03, -0.01]	-4.51
Shift, $\hat{\gamma}_{30}$	0.06	[0.02, 0.09]	3.20	0.04	[0.00, 0.07]	2.21
Grandparent, $\hat{\gamma}_{01}$	-0.05	[-0.15, 0.05]	-1.04	-0.06	[-0.15, 0.04]	-1.17
Working, $\hat{\gamma}_{02}$	0.05	[0.01, 0.09]	2.26	-0.02	[-0.06, 0.02]	-0.88
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.04	[-0.02, 0.09]	1.30	0.03	[-0.01, 0.08]	1.38
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.05	[0.02, 0.07]	3.86	0.04	[0.02, 0.06]	3.73
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.14	[-0.22, -0.06]	-3.37	-0.12	[-0.19, -0.04]	-3.14
Before-slope * Working, $\hat{\gamma}_{12}$	-0.01	[-0.04, 0.01]	-0.86	0.01	[-0.01, 0.03]	0.82
After-slope * Working, $\hat{\gamma}_{22}$	0.02	[0.01, 0.04]	2.94	0.02	[0.00, 0.03]	2.15
Shift * Working, $\hat{\gamma}_{32}$	-0.01	[-0.06, 0.04]	-0.44	-0.01	[-0.05, 0.03]	-0.52
Grandparent * Working, $\hat{\gamma}_{03}$	0.04	[-0.06, 0.14]	0.79	0.11	[0.02, 0.20]	2.33
Before-slope * Grandparent * Working, $\hat{\gamma}_{13}$	-0.02	[-0.08, 0.04]	-0.56	-0.04	[-0.10, 0.02]	-1.34
After-slope * Grandparent * Working, $\hat{\gamma}_{23}$	-0.06	[-0.10, -0.03]	-3.46	-0.05	[-0.08, -0.02]	-3.35
Shift * Grandparent * Working, $\hat{\gamma}_{33}$	0.13	[0.02, 0.23]	2.37	0.12	[0.03, 0.22]	2.62

*Note.* Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *working* = 1 indicates being employed in paid work.

Table 38

*Linear Contrasts for Openness (Moderated by Paid Work; only HRS).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
Shift of not-working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.03	3.80	.051	0.01	1.06	.303
Shift of working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.04	13.84	< .001	0.02	3.72	.054
Shift of not-working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.06	4.22	.040	-0.06	5.04	.025
Shift of working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.02	0.61	.433	0.02	0.75	.385
Shift of not-working controls vs. not-working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.09	7.30	.007	-0.07	6.07	.014
Before-slope of working controls vs. working grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.02	1.23	.267	0.00	0.10	.751
After-slope of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	-0.01	1.08	.299	-0.01	1.00	.317
Shift of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.02	0.93	.336	0.00	0.00	.951
Shift of not-working controls vs. working controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.01	0.48	.487	0.00	0.05	.818
Before-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	-0.03	0.96	.327	-0.03	1.22	.270
After-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	-0.04	5.78	.016	-0.04	7.17	.007
Shift of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.08	4.30	.038	0.08	5.16	.023

*Note.* The linear contrasts are based on the models from Table 37.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

**Table 39***Fixed Effects of Openness Over the Transition to Grandparenthood Moderated by Grandchild Care.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI	$t$	$p$
Intercept, $\hat{\gamma}_{00}$	3.06	[3.01, 3.10]	125.52	< .001	3.00	[2.95, 3.06]	103.68	< .001
Propensity score, $\hat{\gamma}_{04}$	0.08	[-0.01, 0.16]	1.81	.070	0.22	[0.13, 0.30]	5.00	< .001
After-slope, $\hat{\gamma}_{10}$	-0.04	[-0.05, -0.03]	-6.73	< .001	-0.02	[-0.03, -0.01]	-4.90	< .001
Grandparent, $\hat{\gamma}_{01}$	-0.06	[-0.14, 0.01]	-1.74	.082	-0.08	[-0.16, -0.01]	-2.21	.027
Caring, $\hat{\gamma}_{02}$	-0.02	[-0.06, 0.02]	-1.09	.275	0.01	[-0.02, 0.04]	0.67	.503
After-slope * Grandparent, $\hat{\gamma}_{11}$	0.02	[0.00, 0.05]	2.10	.036	0.01	[-0.01, 0.03]	0.88	.377
After-slope * Caring, $\hat{\gamma}_{12}$	0.01	[0.00, 0.03]	1.52	.129	0.00	[-0.02, 0.01]	-0.24	.807
Grandparent * Caring, $\hat{\gamma}_{03}$	0.00	[-0.10, 0.10]	0.02	.985	-0.04	[-0.12, 0.05]	-0.79	.432
After-slope * Grandparent * Caring, $\hat{\gamma}_{13}$	0.01	[-0.02, 0.05]	0.74	.457	0.03	[0.00, 0.06]	1.73	.084

*Note.* Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *caring* = 1 indicates more than 100 hours of grandchild care since the last assessment.

Table 40

*Linear Contrasts for Openness (Moderated by Grandchild Care; only HRS).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
After-slope of caring controls vs. caring grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.04	7.78	.005	0.04	9.46	.002
After-slope of not-caring grandparents vs. caring grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.03	2.58	.108	0.03	3.26	.071

*Note.* The linear contrasts are based on the models from Table 39.  $\hat{\gamma}_c$  = combined fixed-effects estimate.



Table 41

*Fixed Effects of Life Satisfaction Over the Transition to Grandparenthood.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	$t$	$p$	$\hat{\gamma}$	95% CI	$t$	$p$
LISS								
Intercept, $\hat{\gamma}_{00}$	5.11	[4.99, 5.23]	85.63	< .001	5.13	[4.99, 5.27]	72.47	< .001
Propensity score, $\hat{\gamma}_{02}$	0.07	[-0.10, 0.24]	0.78	.433	0.01	[-0.15, 0.17]	0.17	.863
Before-slope, $\hat{\gamma}_{10}$	-0.01	[-0.02, 0.01]	-1.06	.288	0.02	[0.00, 0.03]	2.18	.029
After-slope, $\hat{\gamma}_{20}$	0.01	[0.00, 0.02]	2.13	.033	-0.01	[-0.02, 0.01]	-0.93	.351
Shift, $\hat{\gamma}_{30}$	0.02	[-0.04, 0.08]	0.72	.470	-0.11	[-0.17, -0.05]	-3.42	.001
Grandparent, $\hat{\gamma}_{01}$	0.07	[-0.11, 0.25]	0.73	.464	0.07	[-0.13, 0.26]	0.66	.510
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.02	[-0.01, 0.04]	1.03	.301	-0.01	[-0.04, 0.02]	-0.47	.637
After-slope * Grandparent, $\hat{\gamma}_{21}$	-0.02	[-0.05, 0.00]	-1.78	.075	0.00	[-0.03, 0.02]	-0.33	.741
Shift * Grandparent, $\hat{\gamma}_{31}$	0.05	[-0.08, 0.18]	0.79	.428	0.18	[0.04, 0.32]	2.57	.010
HRS								
Intercept, $\hat{\gamma}_{00}$	4.81	[4.69, 4.92]	82.17	< .001	4.58	[4.45, 4.72]	66.89	< .001
Propensity score, $\hat{\gamma}_{02}$	0.40	[0.19, 0.61]	3.78	< .001	0.33	[0.11, 0.54]	3.01	.003
Before-slope, $\hat{\gamma}_{10}$	-0.03	[-0.07, 0.01]	-1.53	.125	0.05	[0.01, 0.08]	2.50	.013
After-slope, $\hat{\gamma}_{20}$	0.01	[-0.01, 0.04]	0.83	.405	0.04	[0.01, 0.06]	3.14	.002
Shift, $\hat{\gamma}_{30}$	0.02	[-0.05, 0.10]	0.58	.564	-0.05	[-0.12, 0.02]	-1.50	.135
Grandparent, $\hat{\gamma}_{01}$	-0.02	[-0.21, 0.16]	-0.24	.812	0.20	[0.00, 0.39]	1.98	.048
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.12	[0.03, 0.21]	2.58	.010	0.05	[-0.04, 0.13]	1.06	.290
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.03	[-0.02, 0.09]	1.17	.241	0.01	[-0.05, 0.06]	0.31	.753
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.08	[-0.24, 0.09]	-0.93	.351	-0.01	[-0.17, 0.15]	-0.13	.897

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

**Table 42**  
*Linear Contrasts for Life Satisfaction.*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.03	1.76	.185	-0.12	17.14	< .001
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.06	1.51	.219	0.06	1.29	.256
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.03	0.24	.622	0.18	8.25	.004
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.01	0.39	.532	0.01	0.32	.574
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	-0.01	0.84	.358	-0.01	0.70	.403
HRS						
Shift of the controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.03	1.26	.262	-0.02	0.30	.581
Shift of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.01	0.04	.833	-0.02	0.10	.754
Shift of the controls vs. shift of the grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.04	0.49	.485	0.00	0.00	.978
Before-slope of the grandparents vs. 0 ( $\hat{\gamma}_{10} + \hat{\gamma}_{11}$ )	0.09	4.51	.034	0.09	5.61	.018
After-slope of the grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{21}$ )	0.04	2.98	.084	0.05	3.67	.055

*Note.* The linear contrasts are needed in cases where estimates of interest are represented by multiple fixed-effects coefficients and are computed using the *linearHypothesis* function from the *car* R package (Fox & Weisberg, 2019) based on the models from Table 41.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 43

*Fixed Effects of Life Satisfaction Over the Transition to Grandparenthood Moderated by Gender.*

Parameter	Parent controls				Nonparent controls			
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	95% CI	t	p
<b>LISS</b>								
Intercept, $\hat{\gamma}_{00}$	5.05	[4.89, 5.21]	61.49	< .001	5.05	[4.86, 5.24]	51.98	< .001
Propensity score, $\hat{\gamma}_{04}$	0.06	[-0.11, 0.23]	0.70	.485	0.01	[-0.15, 0.17]	0.17	.866
Before-slope, $\hat{\gamma}_{10}$	-0.01	[-0.03, 0.01]	-1.13	.258	0.02	[0.00, 0.05]	2.28	.023
After-slope, $\hat{\gamma}_{20}$	0.01	[0.00, 0.03]	1.55	.122	-0.03	[-0.04, -0.01]	-2.76	.006
Shift, $\hat{\gamma}_{30}$	0.10	[0.01, 0.18]	2.25	.025	0.00	[-0.09, 0.09]	-0.01	.988
Grandparent, $\hat{\gamma}_{01}$	0.21	[-0.04, 0.46]	1.67	.096	0.23	[-0.04, 0.50]	1.65	.099
Female, $\hat{\gamma}_{02}$	0.12	[-0.08, 0.32]	1.18	.239	0.16	[-0.08, 0.40]	1.28	.203
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.04, 0.04]	0.10	.922	-0.03	[-0.08, 0.01]	-1.38	.168
After-slope * Grandparent, $\hat{\gamma}_{21}$	-0.03	[-0.07, 0.01]	-1.62	.104	0.01	[-0.03, 0.05]	0.36	.718
Shift * Grandparent, $\hat{\gamma}_{31}$	0.01	[-0.18, 0.20]	0.10	.919	0.11	[-0.10, 0.31]	1.03	.303
Before-slope * Female, $\hat{\gamma}_{12}$	0.01	[-0.02, 0.03]	0.55	.581	-0.02	[-0.04, 0.01]	-1.10	.273
After-slope * Female, $\hat{\gamma}_{22}$	0.00	[-0.02, 0.02]	-0.11	.913	0.04	[0.01, 0.06]	2.95	.003
Shift * Female, $\hat{\gamma}_{32}$	-0.14	[-0.26, -0.02]	-2.37	.018	-0.21	[-0.33, -0.08]	-3.28	.001
Grandparent * Female, $\hat{\gamma}_{03}$	-0.27	[-0.59, 0.05]	-1.67	.097	-0.31	[-0.66, 0.05]	-1.71	.088
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	0.03	[-0.03, 0.08]	0.87	.385	0.05	[-0.02, 0.11]	1.48	.138
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	0.01	[-0.04, 0.07]	0.51	.607	-0.03	[-0.08, 0.03]	-0.90	.369
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.08	[-0.17, 0.34]	0.63	.530	0.15	[-0.13, 0.43]	1.07	.283
<b>HRS</b>								
Intercept, $\hat{\gamma}_{00}$	4.67	[4.52, 4.82]	60.70	< .001	4.54	[4.37, 4.71]	52.50	< .001
Propensity score, $\hat{\gamma}_{04}$	0.41	[0.20, 0.62]	3.84	< .001	0.30	[0.08, 0.51]	2.71	.007
Before-slope, $\hat{\gamma}_{10}$	0.01	[-0.04, 0.07]	0.49	.625	0.05	[-0.01, 0.10]	1.61	.107
After-slope, $\hat{\gamma}_{20}$	0.00	[-0.04, 0.04]	0.09	.931	0.02	[-0.01, 0.06]	1.31	.190
Shift, $\hat{\gamma}_{30}$	0.07	[-0.04, 0.18]	1.23	.220	-0.16	[-0.27, -0.05]	-2.91	.004
Grandparent, $\hat{\gamma}_{01}$	0.11	[-0.15, 0.37]	0.81	.419	0.25	[-0.02, 0.51]	1.82	.070
Female, $\hat{\gamma}_{02}$	0.24	[0.07, 0.41]	2.75	.006	0.10	[-0.10, 0.29]	0.98	.329
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.00	[-0.13, 0.14]	0.03	.978	-0.02	[-0.15, 0.11]	-0.33	.745
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.04	[-0.04, 0.13]	1.05	.294	0.03	[-0.05, 0.10]	0.62	.536
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.08	[-0.33, 0.16]	-0.65	.514	0.14	[-0.10, 0.37]	1.16	.246
Before-slope * Female, $\hat{\gamma}_{12}$	-0.08	[-0.16, 0.00]	-2.08	.037	0.01	[-0.07, 0.08]	0.14	.887
After-slope * Female, $\hat{\gamma}_{22}$	0.02	[-0.03, 0.07]	0.64	.525	0.02	[-0.03, 0.07]	0.84	.399
Shift * Female, $\hat{\gamma}_{32}$	-0.09	[-0.24, 0.06]	-1.14	.254	0.19	[0.05, 0.33]	2.59	.010

Table 43 continued

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	p
Grandparent * Female, $\hat{\gamma}_{03}$	-0.23	[-0.55, 0.09]	-1.42	.156	-0.08	-0.47
Before-slope * Grandparent * Female, $\hat{\gamma}_{13}$	0.21	[0.03, 0.39]	2.28	.023	0.11	1.34
After-slope * Grandparent * Female, $\hat{\gamma}_{23}$	-0.02	[-0.13, 0.09]	-0.37	.714	-0.03	-0.50
Shift * Grandparent * Female, $\hat{\gamma}_{33}$	0.01	[-0.32, 0.34]	0.06	.954	-0.26	-1.63
						.103

*Note.* Two models were computed for each of the two samples (LISS, HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval.

Table 44

*Linear Contrasts for Life Satisfaction (Moderated by Gender).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
LISS						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.11	8.55	.003	-0.03	0.42	.515
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.03	0.77	.379	-0.20	26.82	< .001
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.09	1.42	.233	0.09	1.17	.279
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.04	0.39	.531	0.04	0.35	.552
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.02	0.07	.794	0.12	1.58	.208
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.03	1.96	.161	0.01	0.47	.493
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	-0.02	0.99	.320	-0.02	0.86	.353
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	0.07	0.92	.338	0.24	8.27	.004
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.14	7.55	.006	-0.17	9.46	.002
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.03	1.56	.211	0.03	1.23	.267
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.01	0.27	.602	0.01	0.22	.638
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.05	0.21	.647	-0.04	0.16	.690
HRS						
Shift of male controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.07	2.68	.101	-0.14	10.20	.001
Shift of female controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.00	0.00	.973	0.07	4.01	.045
Shift of grandfathers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.04	0.17	.680	0.03	0.12	.732
Shift of grandmothers vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.05	0.37	.541	-0.05	0.48	.489
Shift of male controls vs. grandfathers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	-0.04	0.15	.700	0.16	3.22	.073
Before-slope of female controls vs. grandmothers ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.21	12.04	.001	0.09	2.72	.099
After-slope of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	0.02	0.38	.540	0.00	0.00	.953
Shift of female controls vs. grandmothers ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.05	0.31	.575	-0.12	2.31	.129
Shift of male vs. female controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.07	1.44	.229	0.21	13.91	< .001
Before-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.13	2.33	.127	0.12	2.41	.121
After-slope of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.00	0.01	.931	-0.01	0.02	.894
Shift of grandfathers vs. grandmothers ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.08	0.52	.471	-0.08	0.52	.470

*Note.* The linear contrasts are based on the models from Table 43.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

Table 45

*Fixed Effects of Life Satisfaction Over the Transition to Grandparenthood Moderated by Performing Paid Work.*

Parameter	Parent controls			Nonparent controls		
	$\hat{\gamma}$	95% CI	t	p	$\hat{\gamma}$	p
Intercept, $\hat{\gamma}_{00}$	4.78	[4.63, 4.93]	62.86	< .001	4.55	< .001
Propensity score, $\hat{\gamma}_{04}$	0.36	[0.15, 0.57]	3.33	.001	0.28	.012
Before-slope, $\hat{\gamma}_{10}$	-0.06	[-0.13, 0.01]	-1.77	.077	-0.02	.613
After-slope, $\hat{\gamma}_{20}$	-0.03	[-0.07, 0.00]	-1.73	.083	0.08	< .001
Shift, $\hat{\gamma}_{30}$	0.13	[0.01, 0.25]	2.11	.034	0.07	.243
Grandparent, $\hat{\gamma}_{01}$	-0.02	[-0.33, 0.30]	-0.09	.925	0.22	.169
Working, $\hat{\gamma}_{02}$	0.07	[-0.07, 0.22]	0.99	.324	0.12	.102
Before-slope * Grandparent, $\hat{\gamma}_{11}$	0.14	[-0.04, 0.32]	1.50	.134	0.10	.264
After-slope * Grandparent, $\hat{\gamma}_{21}$	0.07	[-0.02, 0.15]	1.57	.116	-0.05	.231
Shift * Grandparent, $\hat{\gamma}_{31}$	-0.04	[-0.31, 0.22]	-0.31	.755	0.01	.917
Before-slope * Working, $\hat{\gamma}_{12}$	0.05	[-0.03, 0.14]	1.21	.225	0.09	.047
After-slope * Working, $\hat{\gamma}_{22}$	0.10	[0.05, 0.15]	3.83	< .001	-0.08	.002
Shift * Working, $\hat{\gamma}_{32}$	-0.20	[-0.35, -0.04]	-2.50	.012	-0.15	.052
Grandparent * Working, $\hat{\gamma}_{03}$	-0.02	[-0.36, 0.32]	-0.11	.912	-0.07	.676
Before-slope * Grandparent * Working, $\hat{\gamma}_{13}$	-0.03	[-0.24, 0.18]	-0.28	.777	-0.06	.527
After-slope * Grandparent * Working, $\hat{\gamma}_{23}$	-0.08	[-0.20, 0.03]	-1.40	.161	0.10	.073
Shift * Grandparent * Working, $\hat{\gamma}_{33}$	-0.03	[-0.38, 0.32]	-0.18	.859	-0.09	.590

*Note.* Two models were computed (only HRS): grandparents matched with parent controls and with nonparent controls. CI = confidence interval. *working* = 1 indicates being employed in paid work.

Table 46

*Linear Contrasts for Life Satisfaction (Moderated by Paid Work; only HRS).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
Shift of not-working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30}$ )	0.10	3.85	.050	0.15	9.24	.002
Shift of working controls vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	0.00	0.00	.969	-0.08	5.03	.025
Shift of not-working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.12	1.47	.226	0.12	1.63	.201
Shift of working grandparents vs. 0 ( $\hat{\gamma}_{20} + \hat{\gamma}_{30} + \hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.09	1.57	.210	-0.10	2.13	.144
Shift of not-working controls vs. not-working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31}$ )	0.02	0.04	.834	-0.03	0.10	.746
Before-slope of working controls vs. working grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	0.11	3.95	.047	0.03	0.44	.505
After-slope of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{23}$ )	-0.02	0.17	.676	0.05	1.82	.178
Shift of working controls vs. working grandparents ( $\hat{\gamma}_{21} + \hat{\gamma}_{31} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.09	1.21	.270	-0.03	0.11	.746
Shift of not-working controls vs. working controls ( $\hat{\gamma}_{22} + \hat{\gamma}_{32}$ )	-0.10	2.47	.116	-0.23	13.96	< .001
Before-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	0.02	0.05	.823	0.02	0.05	.818
After-slope of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{23}$ )	0.02	0.12	.727	0.02	0.17	.678
Shift of not-working grandparents vs. working grandparents ( $\hat{\gamma}_{22} + \hat{\gamma}_{32} + \hat{\gamma}_{23} + \hat{\gamma}_{33}$ )	-0.21	2.87	.090	-0.22	3.48	.062

*Note.* The linear contrasts are based on the models from Table 45.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

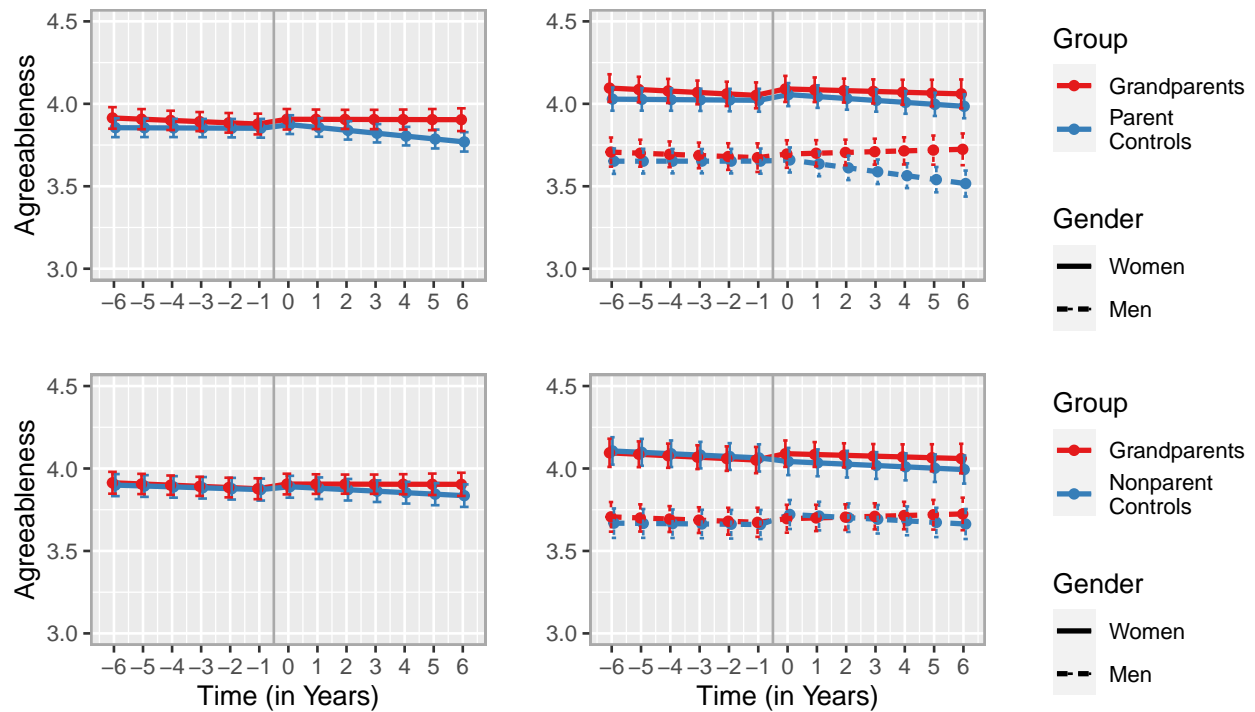
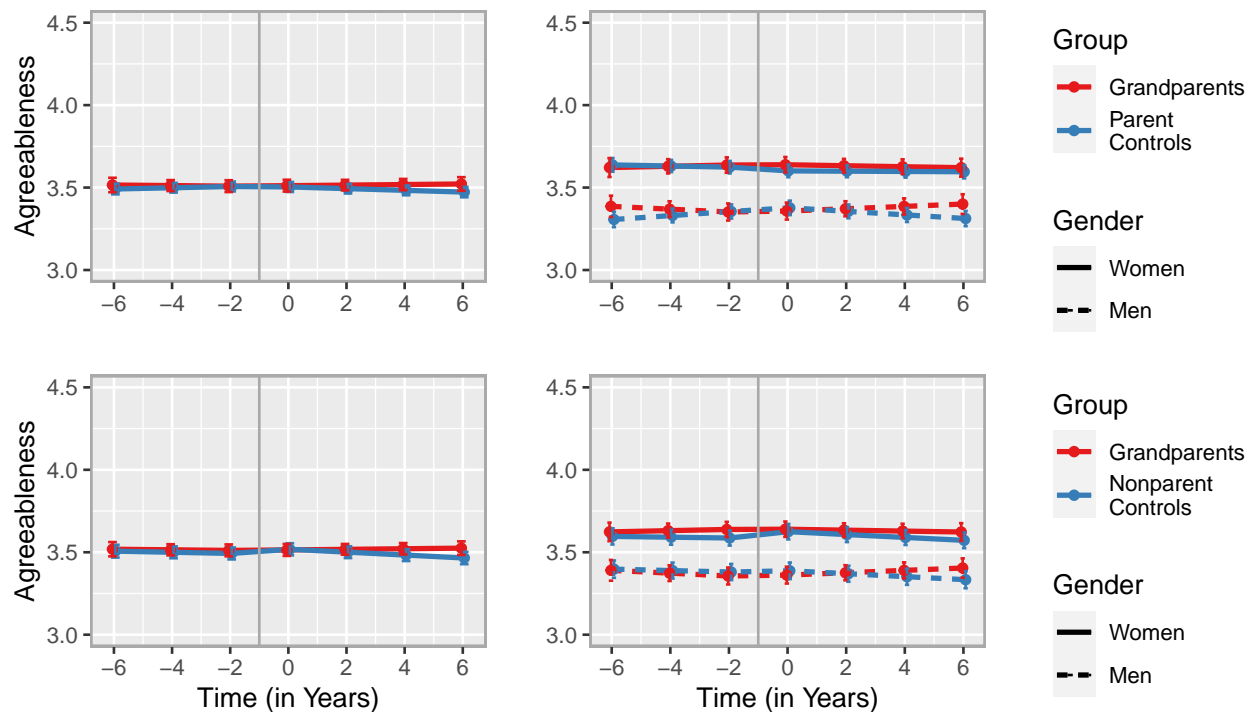




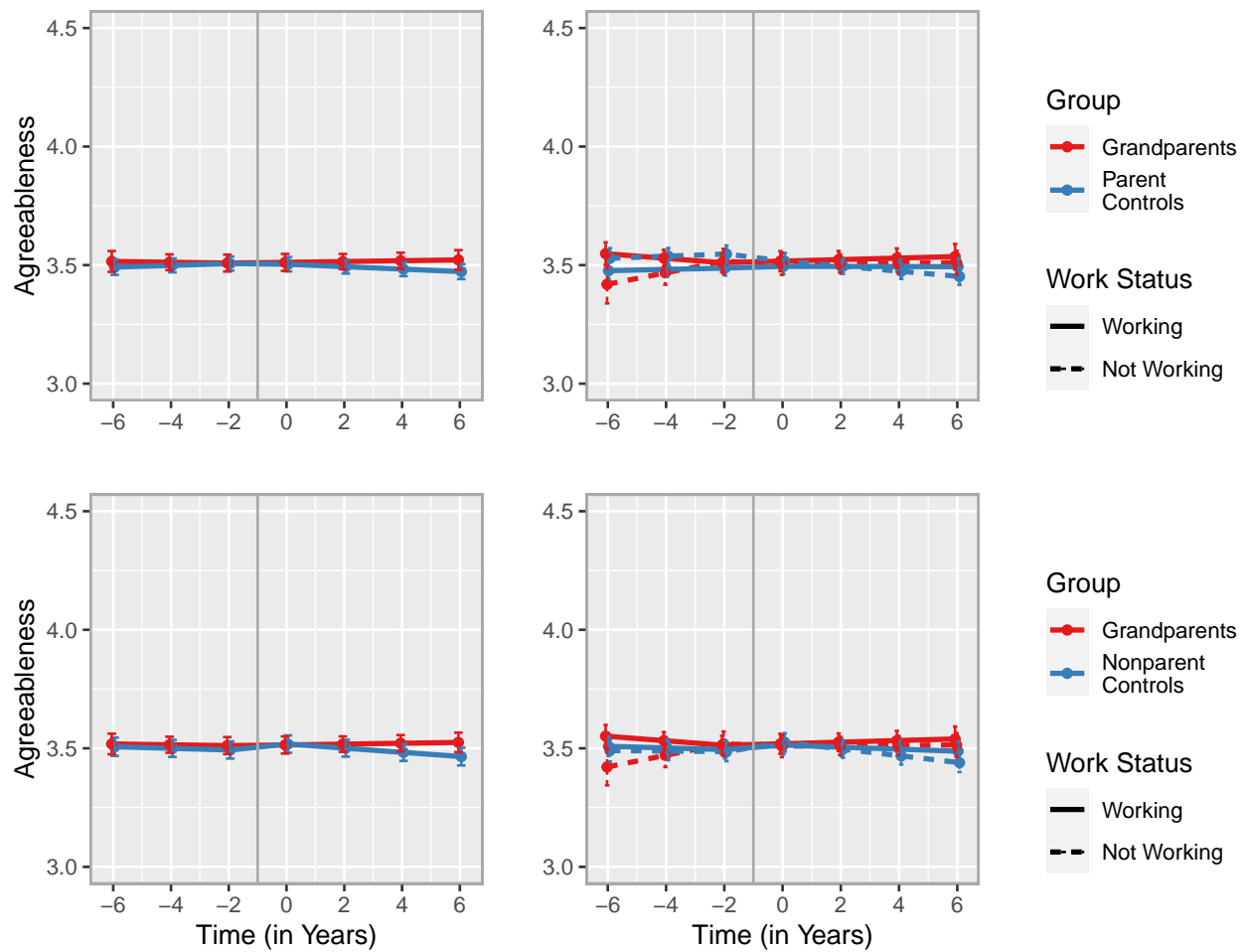
**Table 48**  
*Linear Contrasts for Life Satisfaction (Moderated by Grandchild Care; only HRS).*

Linear Contrast	Parent controls			Nonparent controls		
	$\hat{\gamma}_c$	$\chi^2$	$p$	$\hat{\gamma}_c$	$\chi^2$	$p$
After-slope of caring controls vs. caring grandparents ( $\hat{\gamma}_{11} + \hat{\gamma}_{13}$ )	-0.01	0.10	.751	0.01	0.13	.722
After-slope of not-caring grandparents vs. caring grandparents ( $\hat{\gamma}_{12} + \hat{\gamma}_{13}$ )	-0.04	0.49	.486	-0.04	0.73	.392

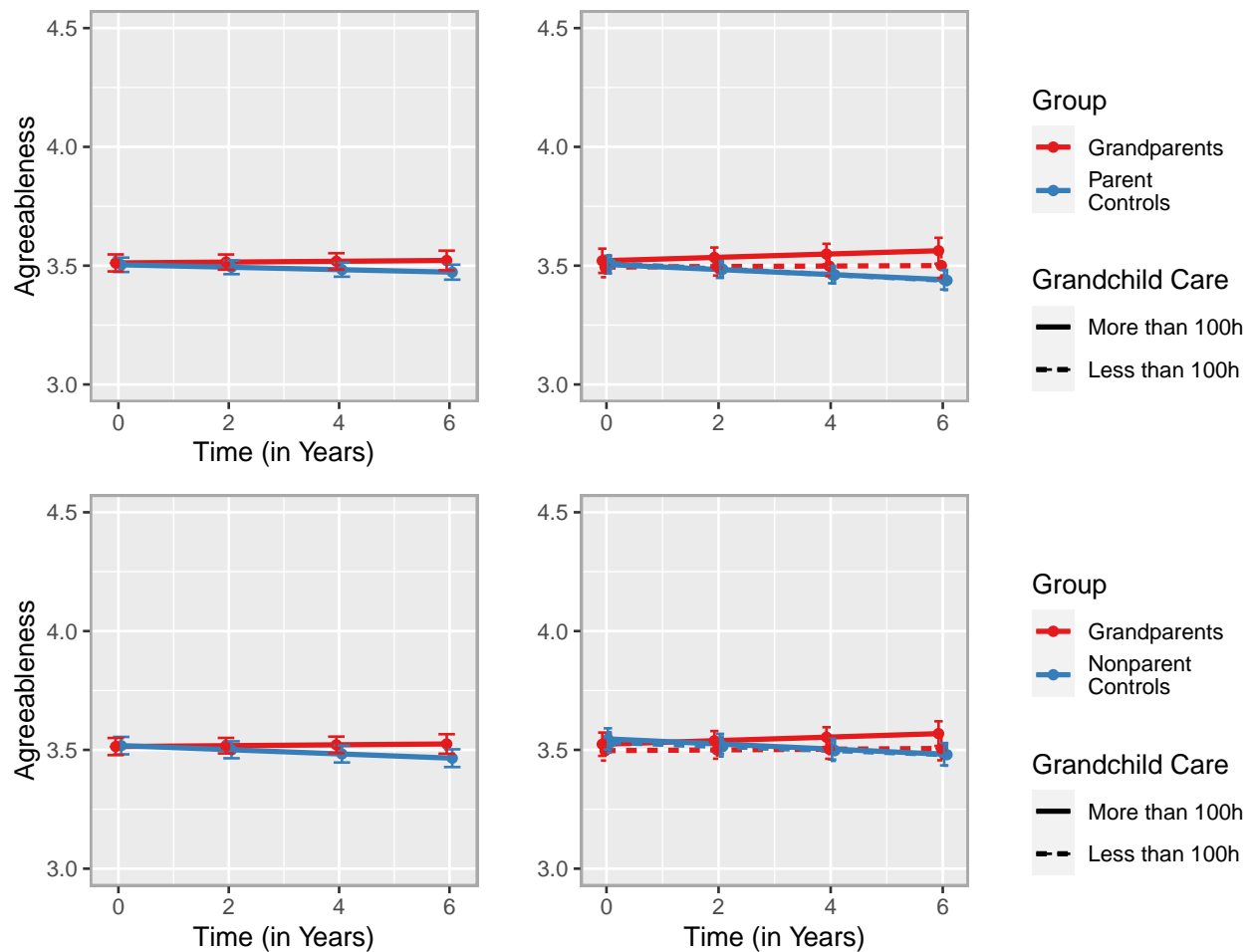
*Note.* The linear contrasts are based on the models from Table 47.  $\hat{\gamma}_c$  = combined fixed-effects estimate.

**LISS****HRS****Figure 1**

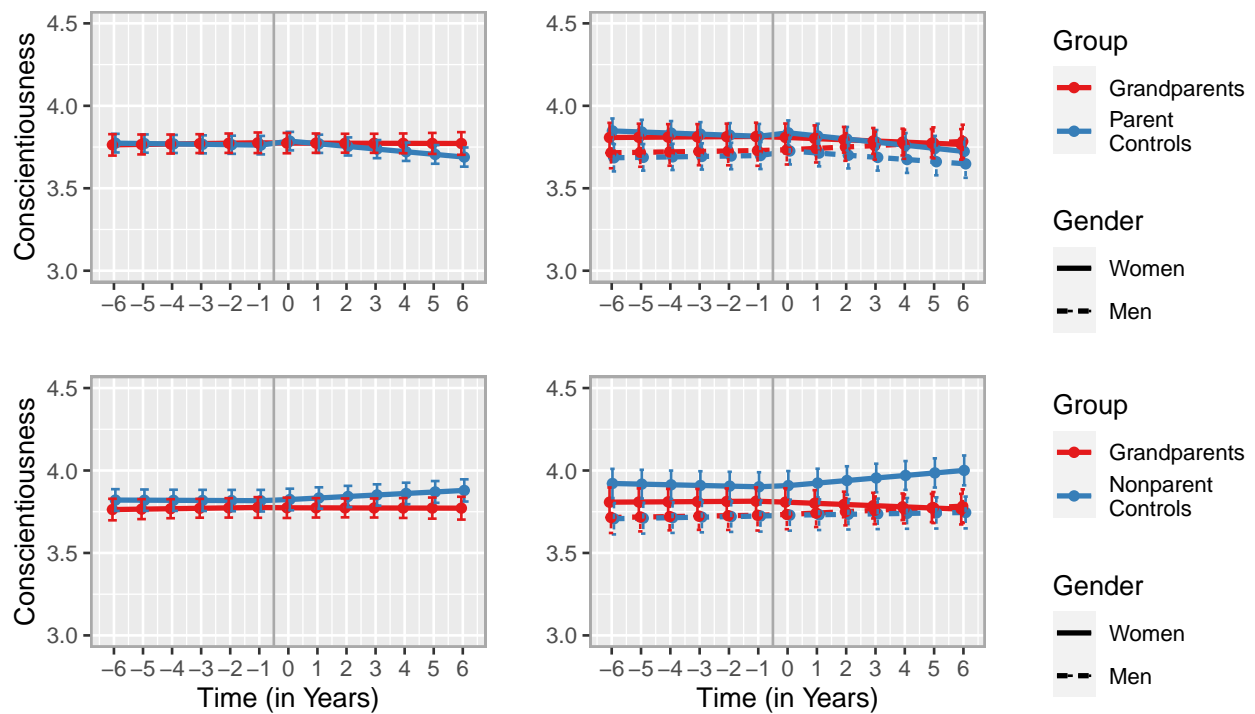
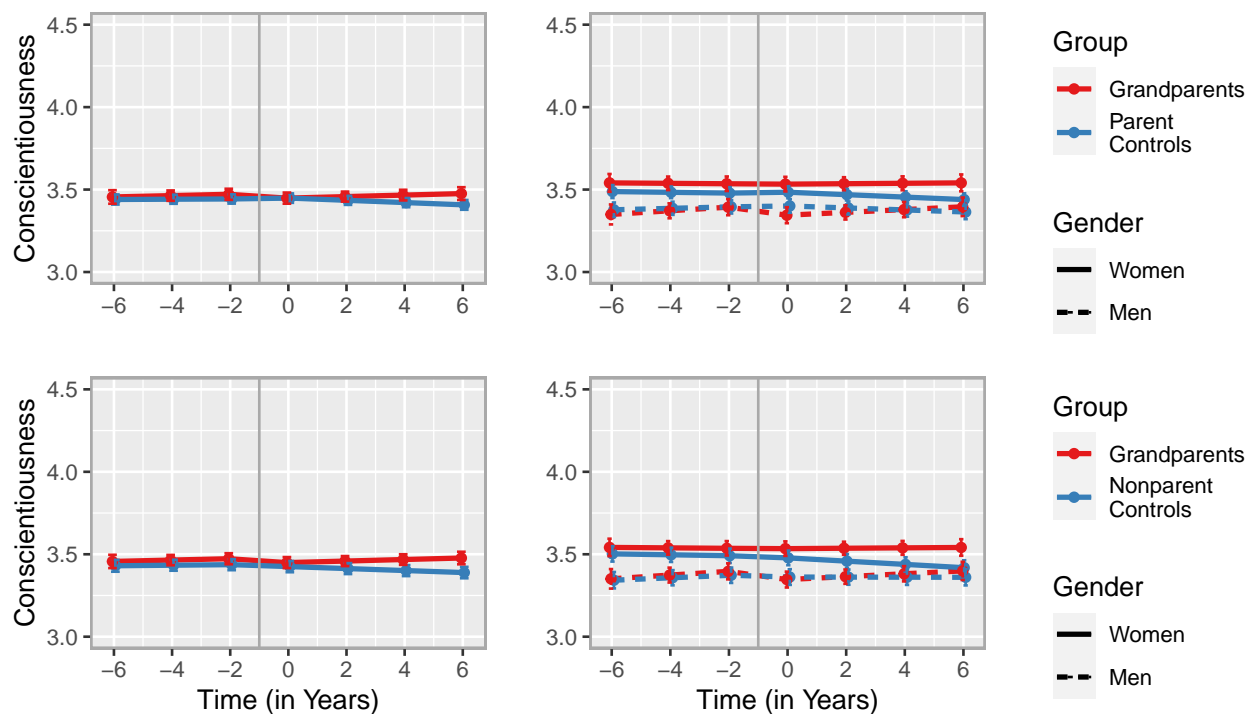
*Change trajectories of agreeableness based on the basic models (1st column) and the models with the gender interaction (2nd column). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

**HRS****Figure 2**

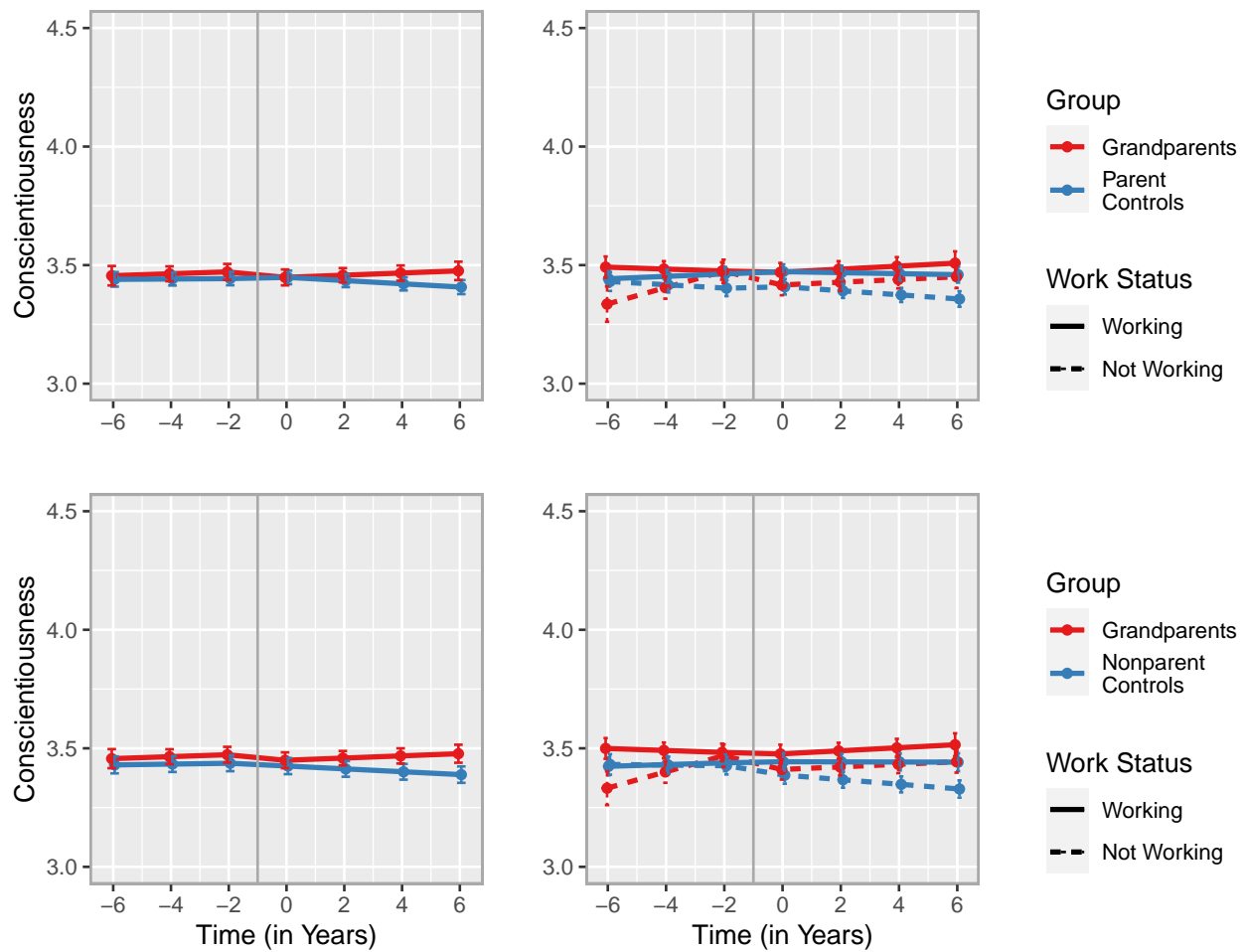
*Change trajectories of agreeableness based on the models of moderation by paid work (see Table 5). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

**HRS****Figure 3**

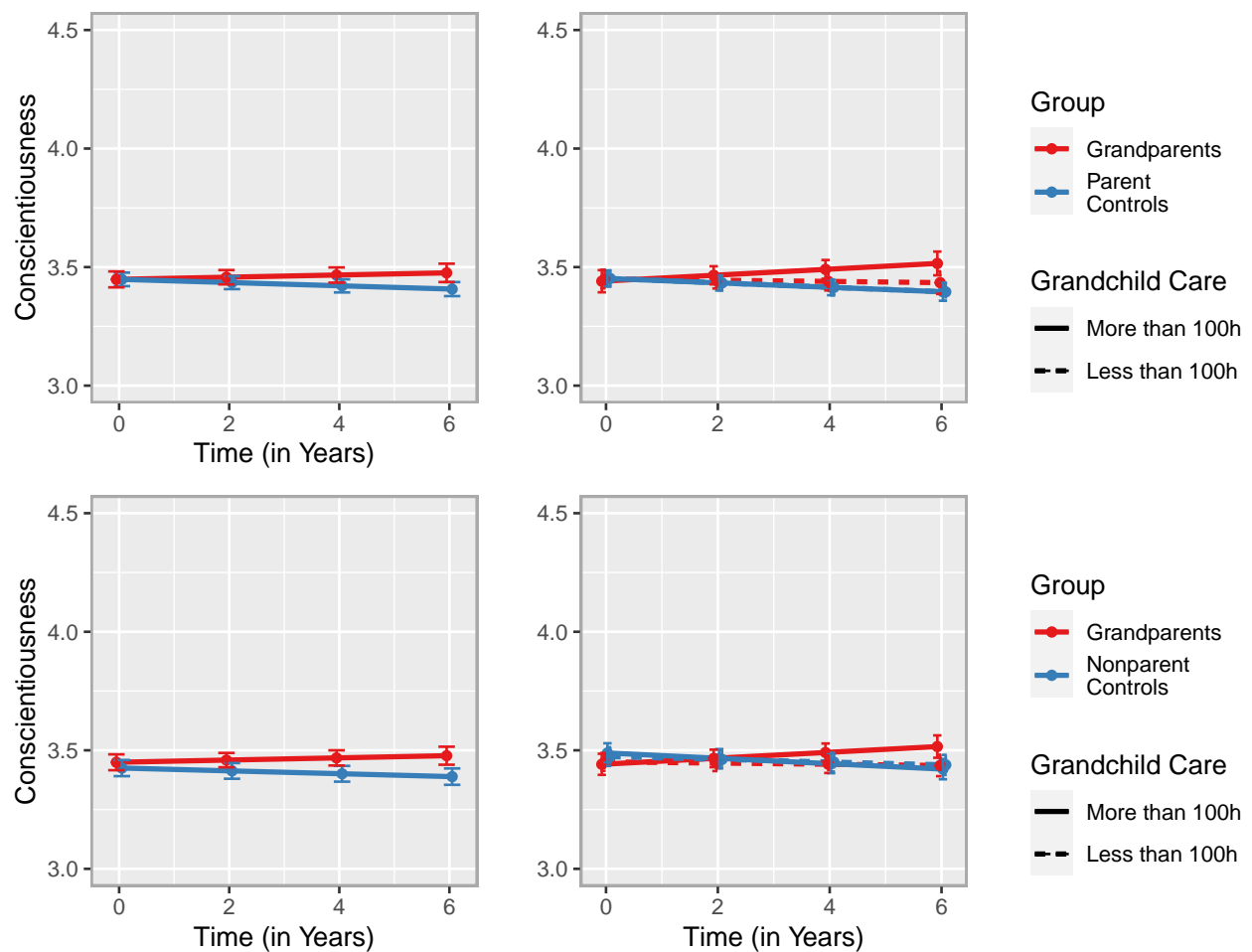
*Change trajectories of agreeableness based on the models of moderation by grandchild care (see Table 7). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The plots in the left column are the same as in Figures 1 and 2 but restricted to the post-transition period for better comparability.*

**LISS****HRS****Figure 4**

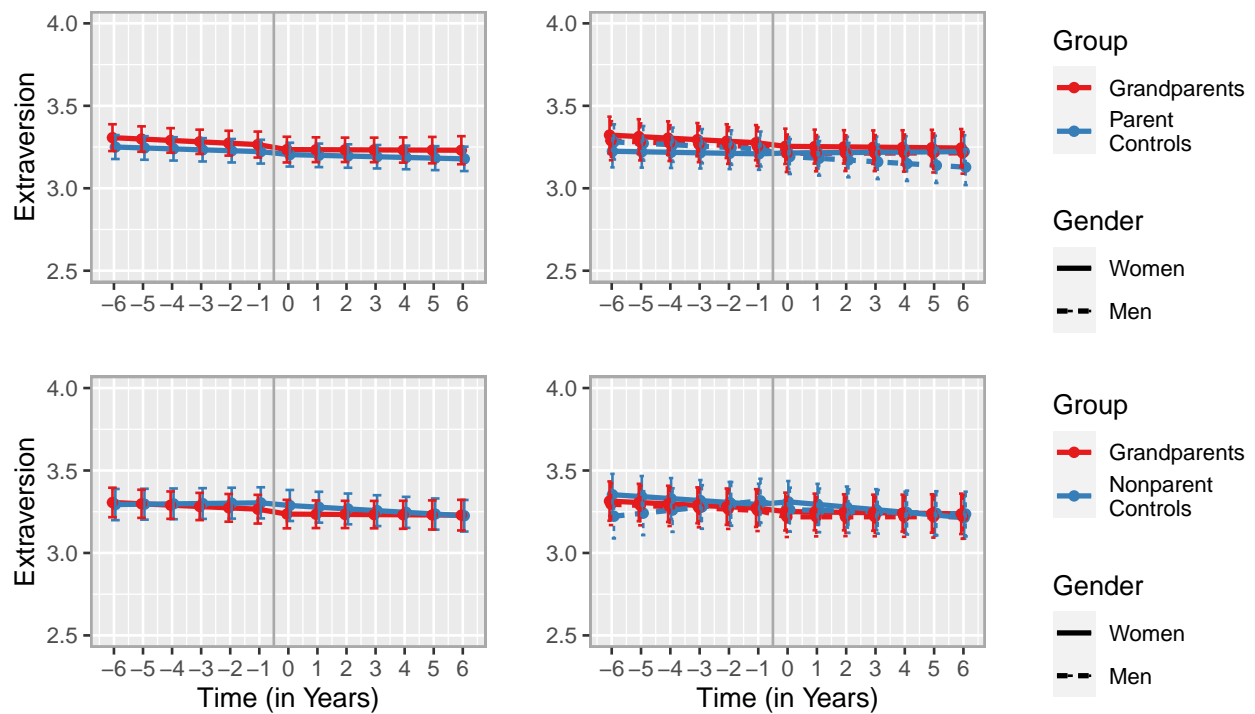
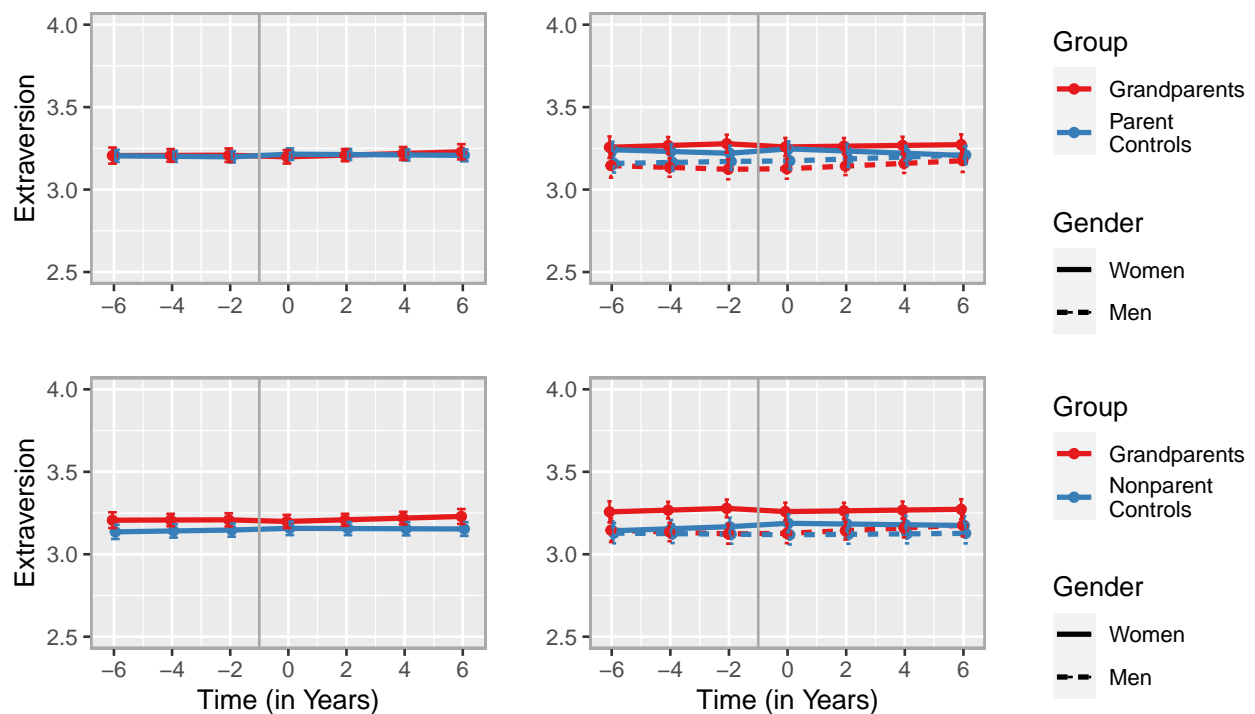
*Change trajectories of conscientiousness based on the basic models (1st column) and the models with the gender interaction (2nd column). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

**HRS****Figure 5**

*Change trajectories of conscientiousness based on the models of moderation by paid work (see Table 13). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

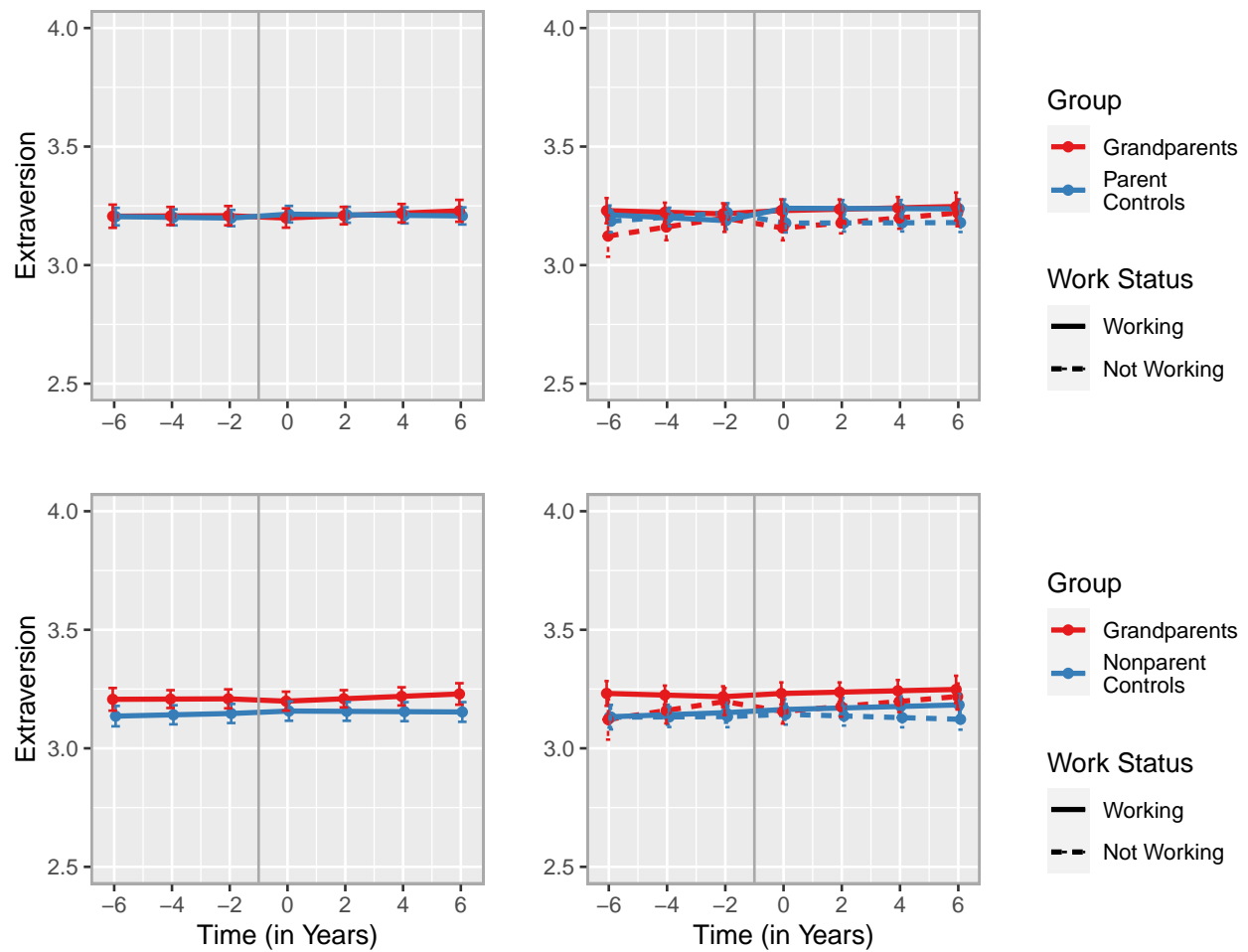
**HRS****Figure 6**

*Change trajectories of conscientiousness based on the models of moderation by grandchild care (see Table 15). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The plots in the left column are the same as in Figures 4 and 5 but restricted to the post-transition period for better comparability.*

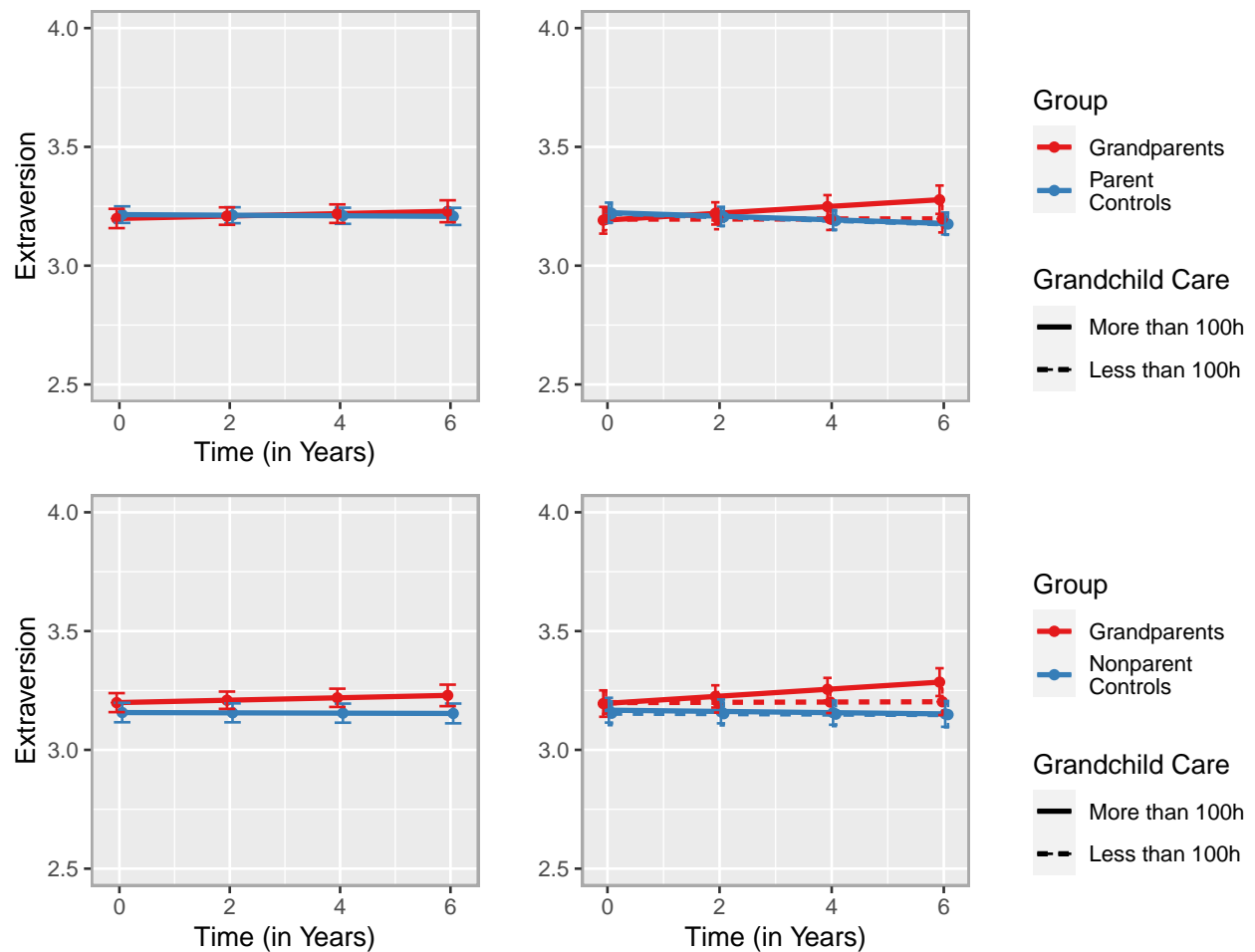
**LISS****HRS****Figure 7**

*Change trajectories of extraversion based on the basic models (1st column) and the models with the gender interaction (2nd column). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

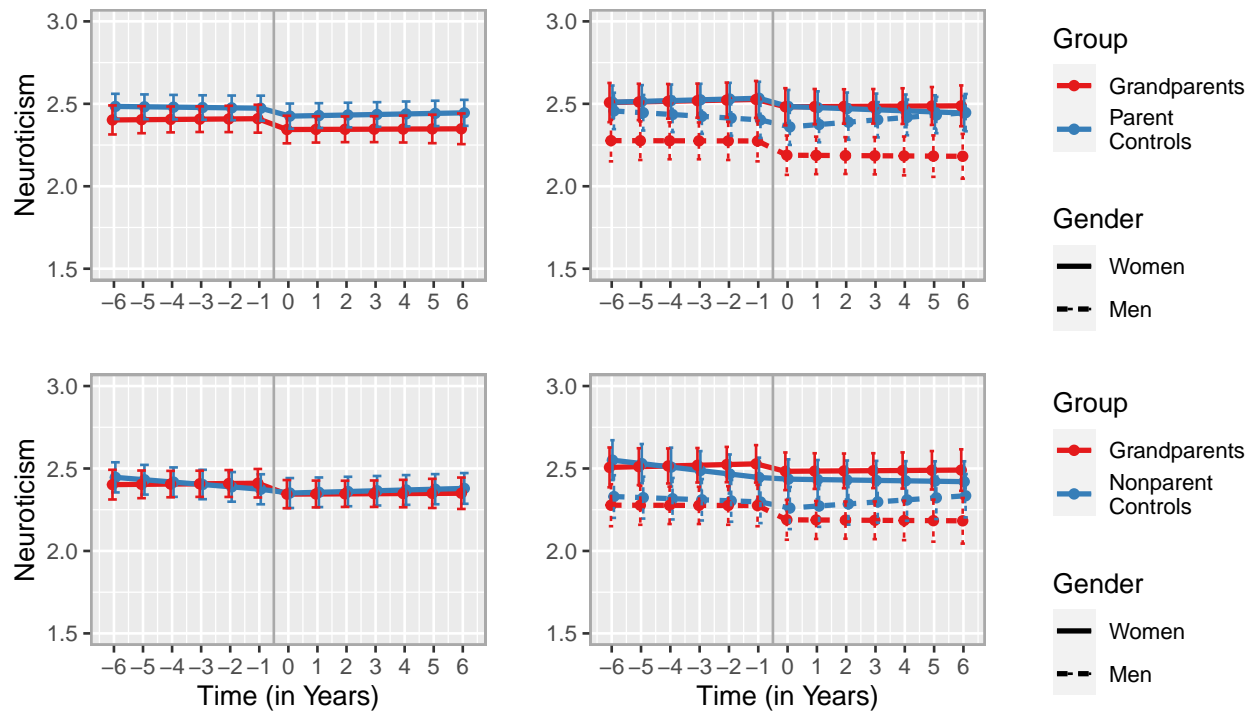
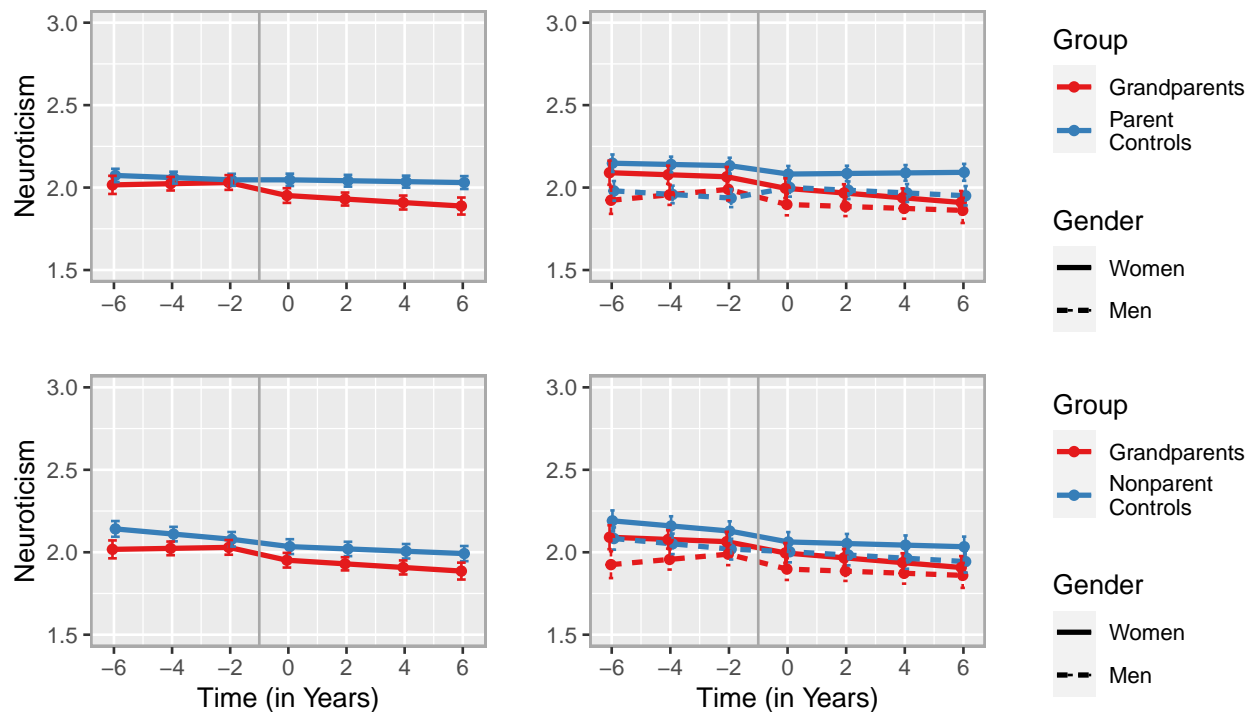


**HRS****Figure 8**

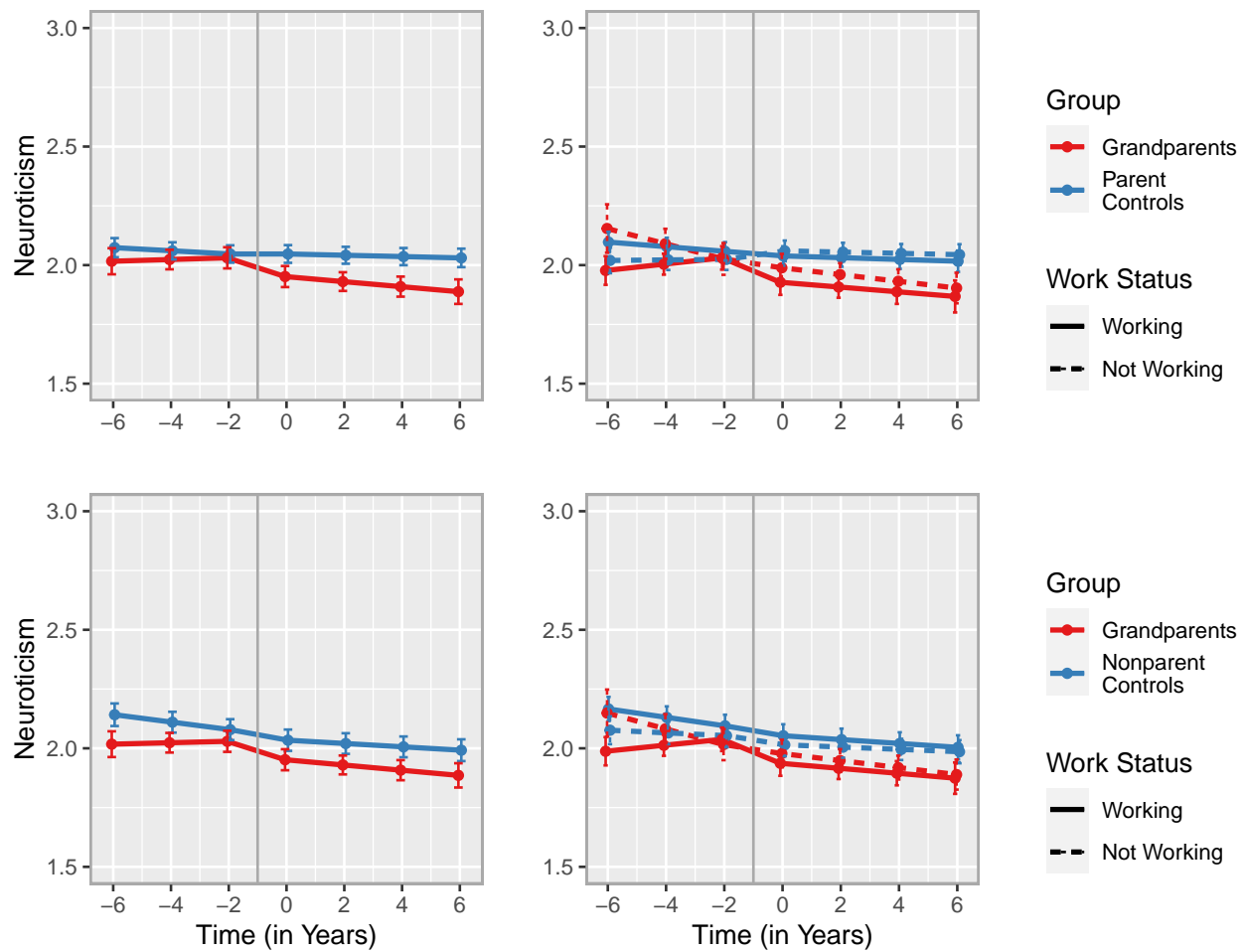
*Change trajectories of extraversion based on the models of moderation by paid work (see Table 21). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

**HRS****Figure 9**

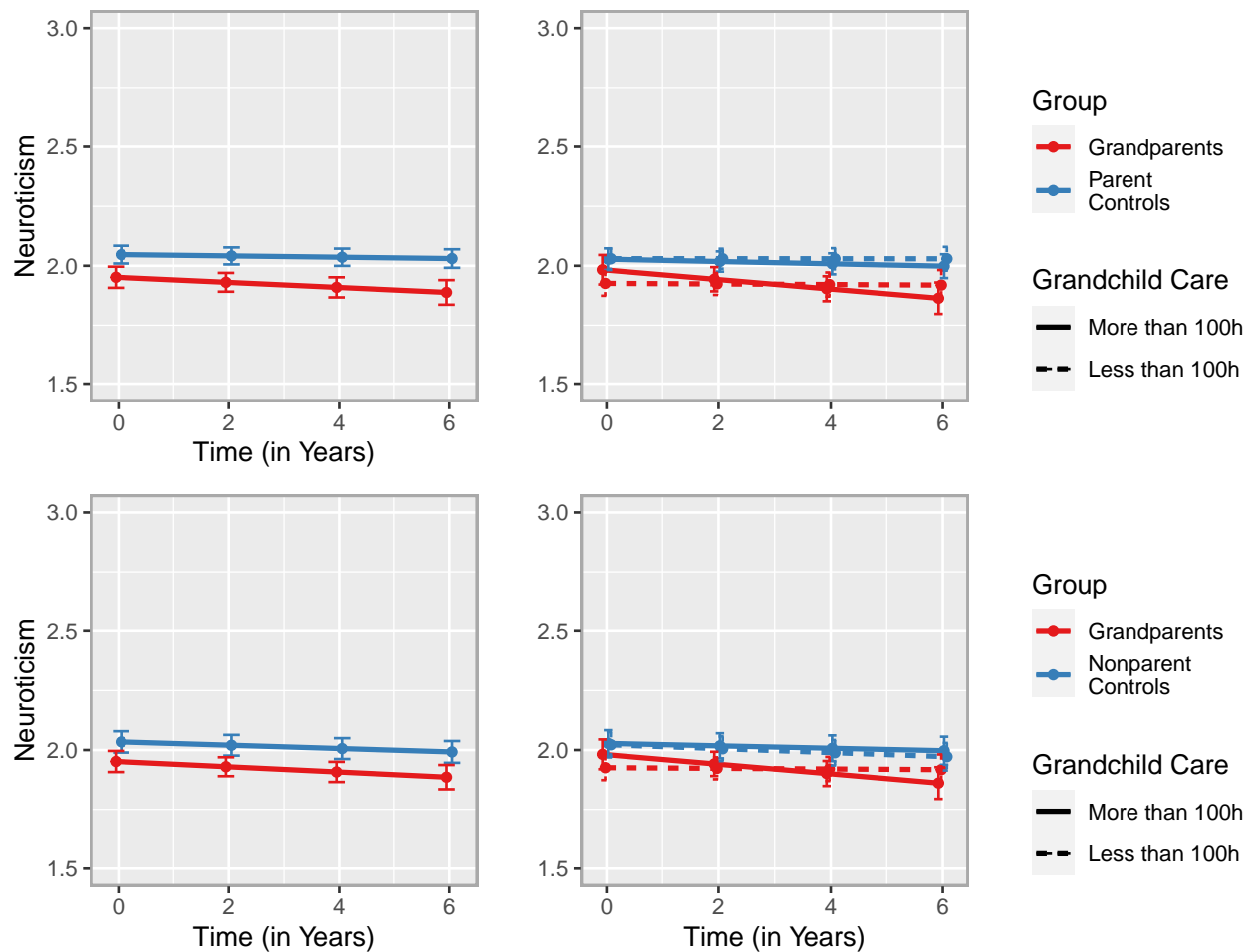
*Change trajectories of extraversion based on the models of moderation by grandchild care (see Table 23). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The plots in the left column are the same as in Figures 7 and 8 but restricted to the post-transition period for better comparability.*

**LISS****HRS****Figure 10**

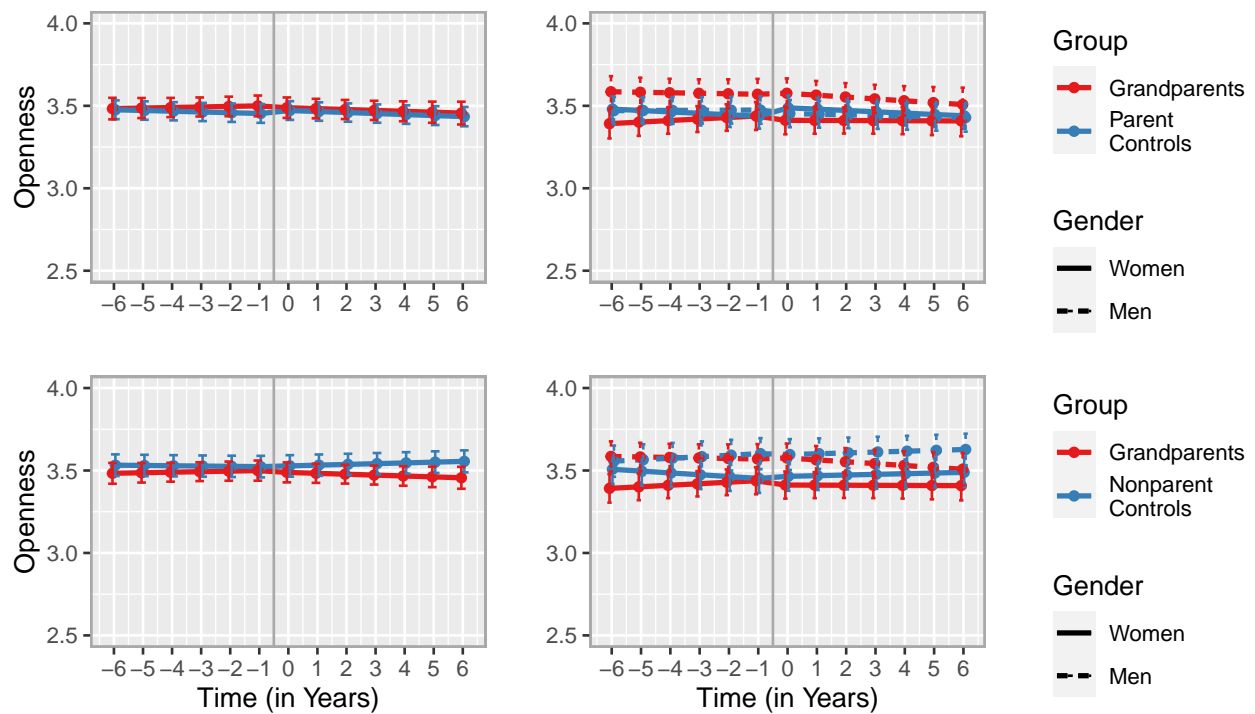
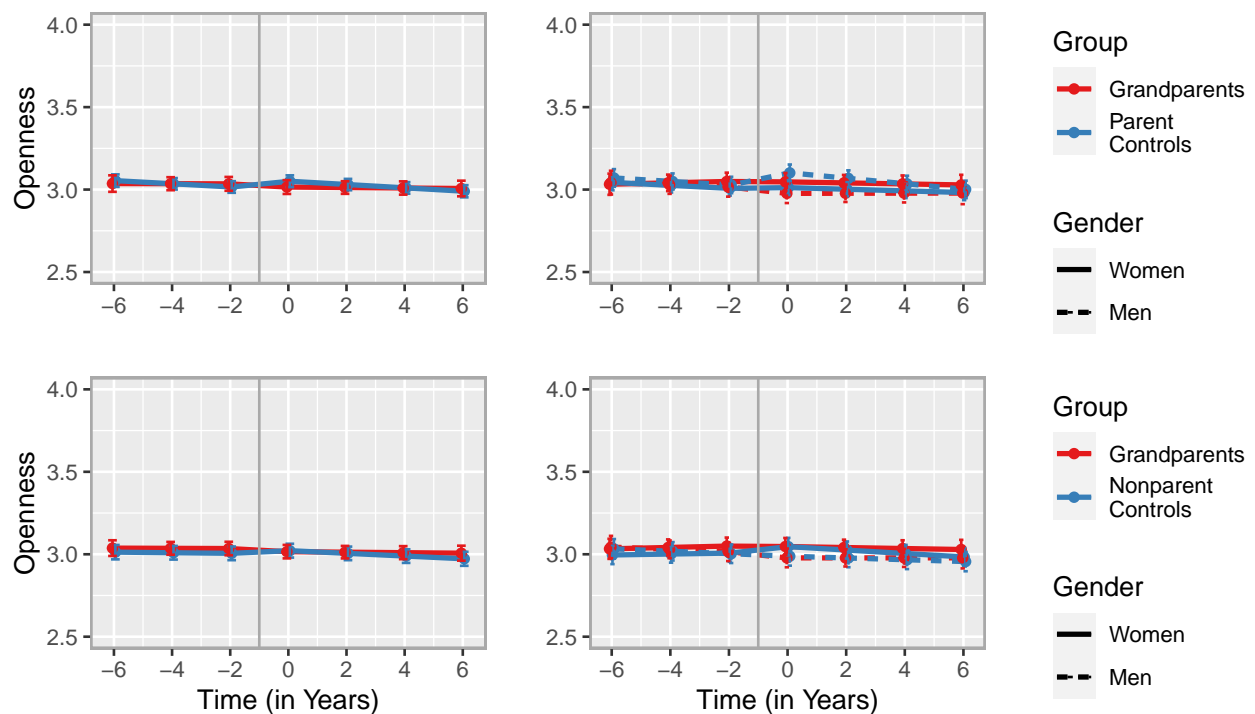
*Change trajectories of neuroticism based on the basic models (1st column) and the models with the gender interaction (2nd column). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

**HRS****Figure 11**

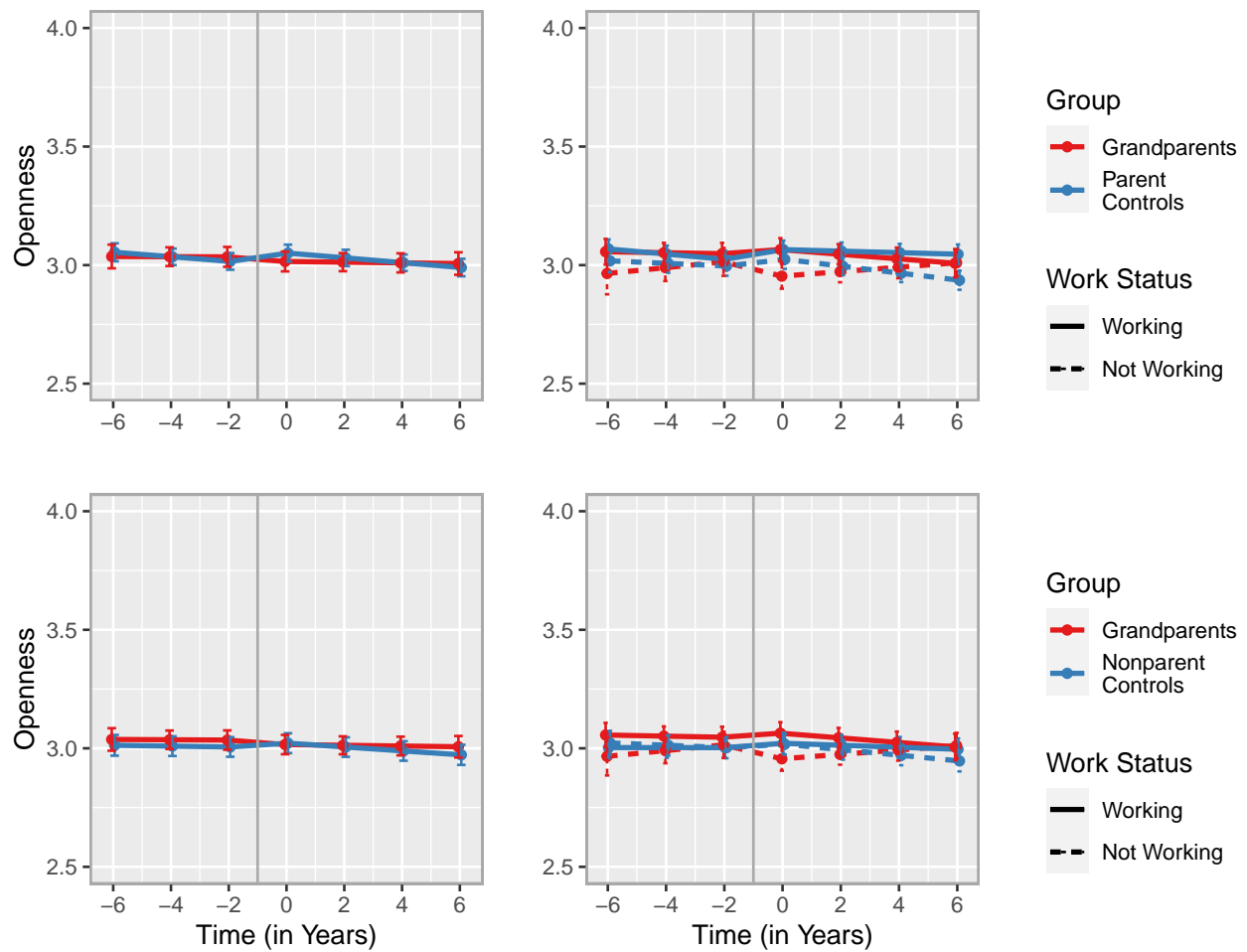
*Change trajectories of neuroticism based on the models of moderation by paid work (see Table 29). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

**HRS****Figure 12**

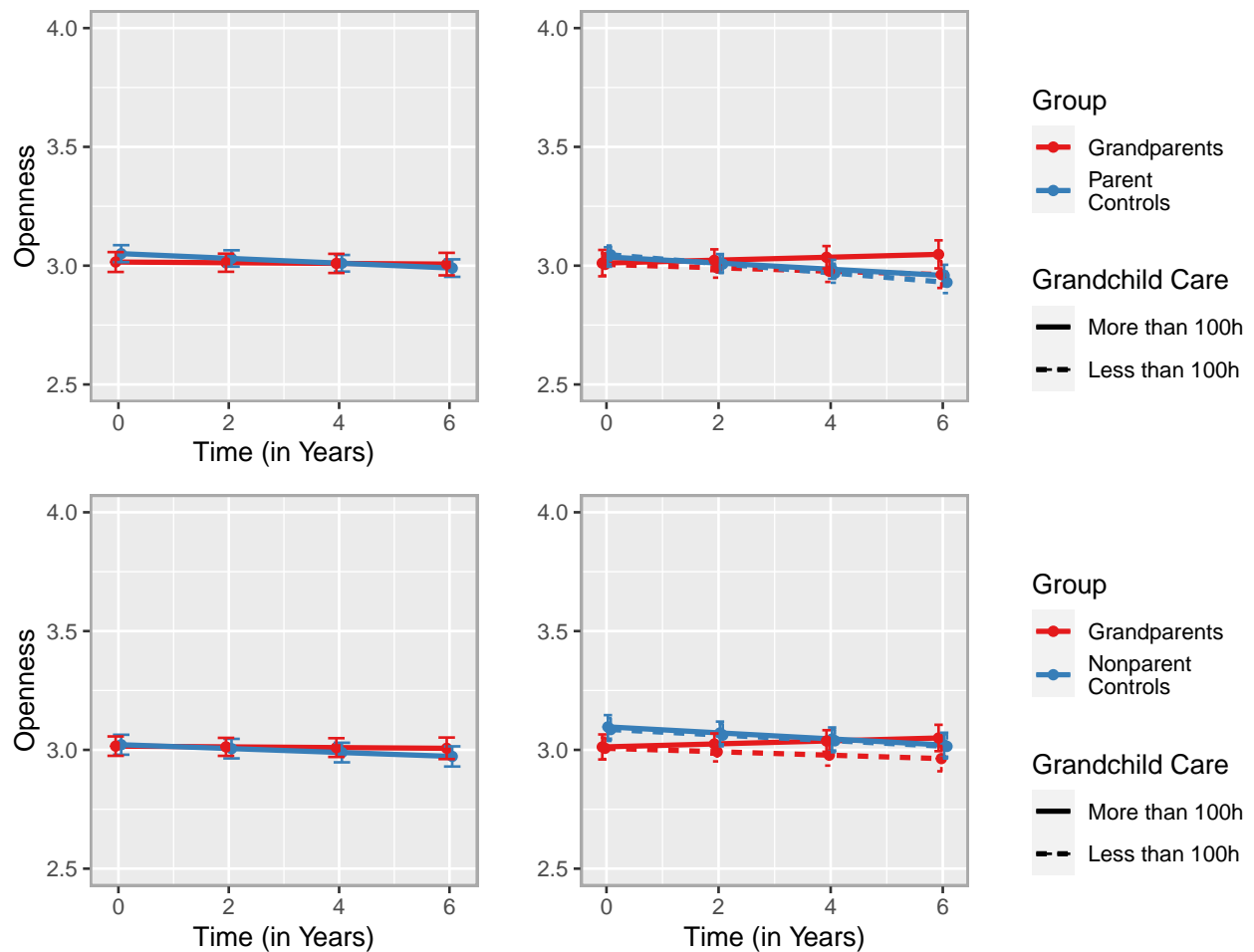
*Change trajectories of neuroticism based on the models of moderation by grandchild care (see Table 31). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The plots in the left column are the same as in Figures 10 and 11 but restricted to the post-transition period for better comparability.*

**LISS****HRS****Figure 13**

*Change trajectories of openness based on the basic models (1st column) and the models with the gender interaction (2nd column). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

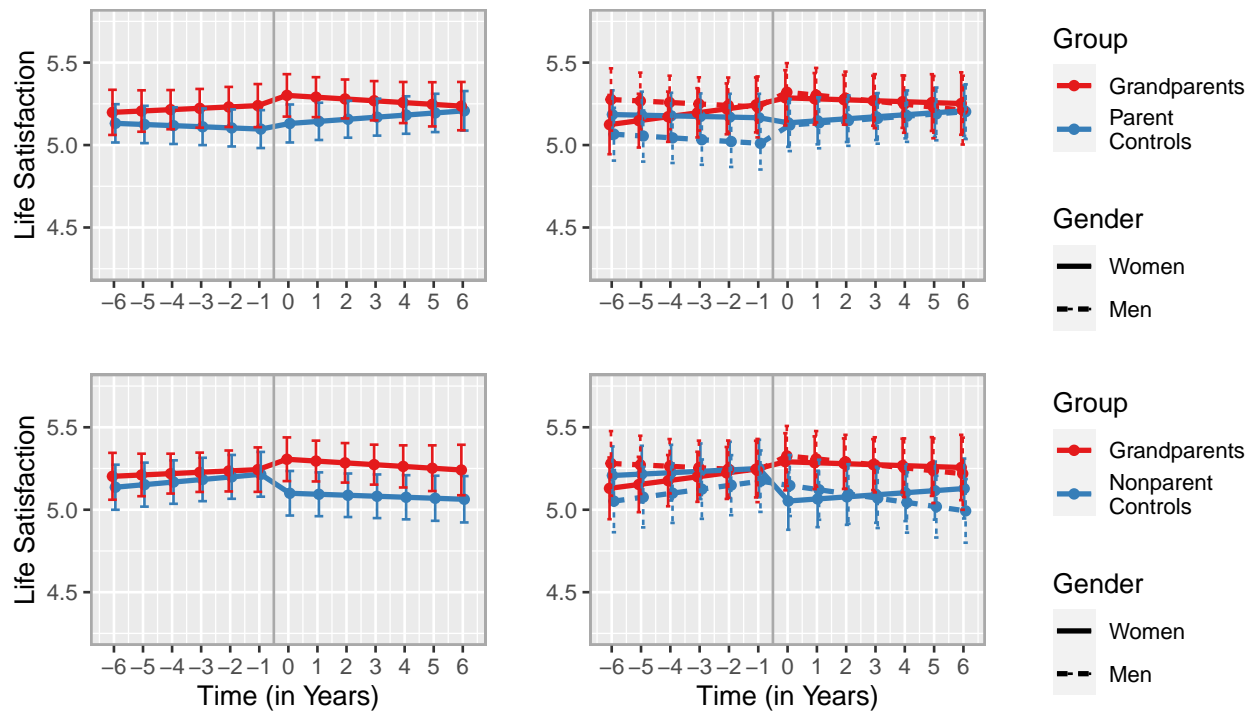
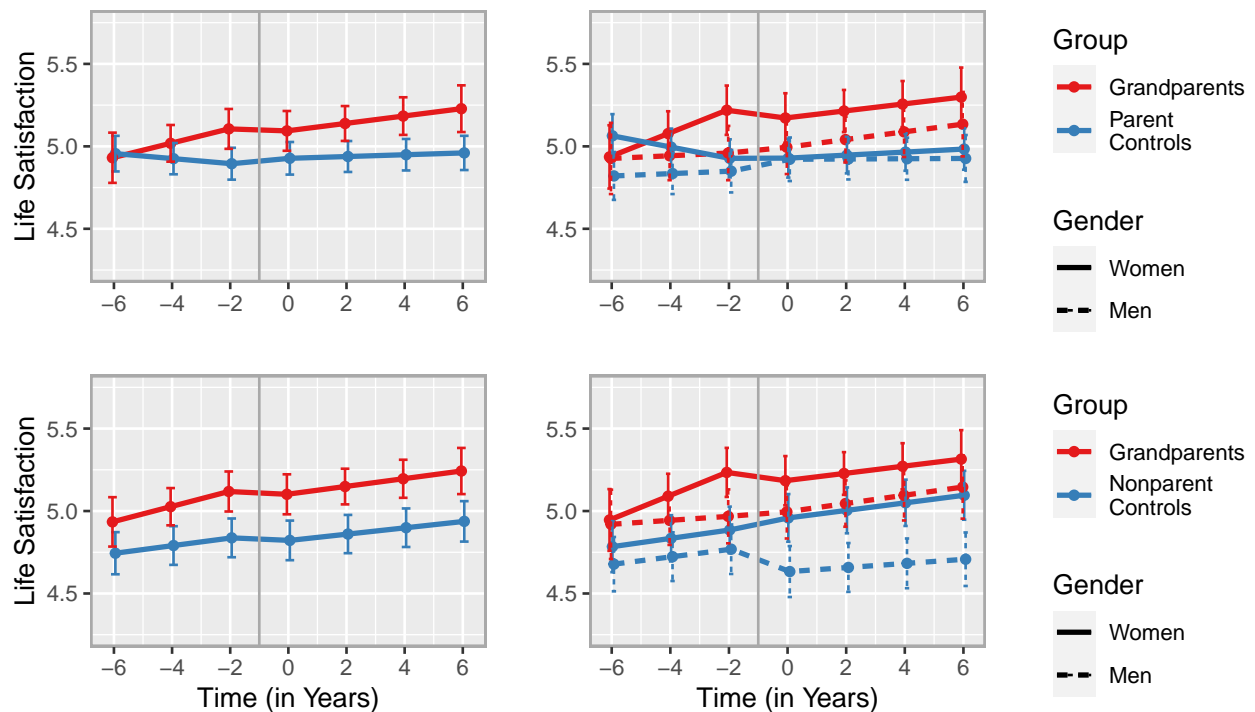
**HRS****Figure 14**

*Change trajectories of openness based on the models of moderation by paid work (see Table 37). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

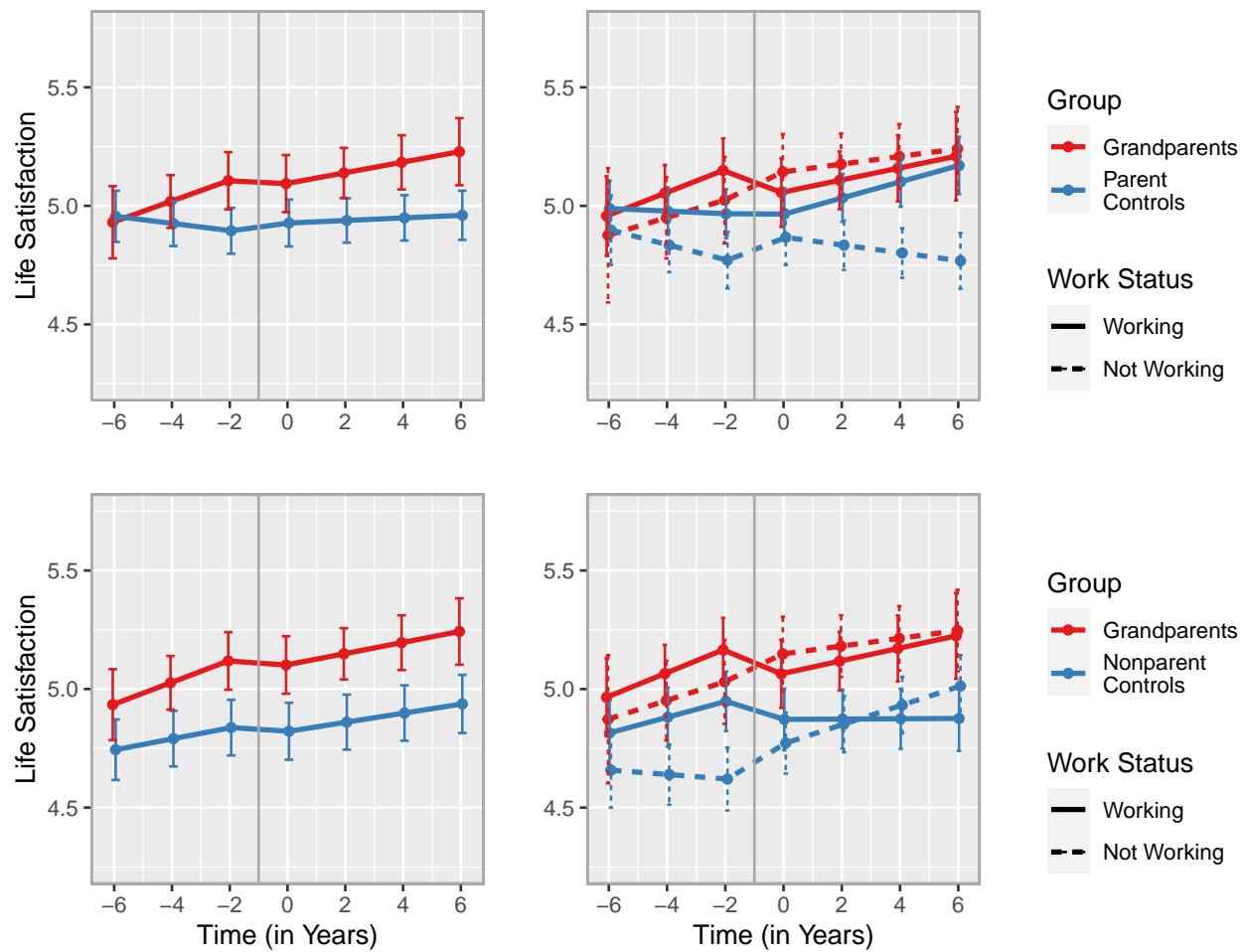
**HRS****Figure 15**

*Change trajectories of openness based on the models of moderation by grandchild care (see Table 39). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The plots in the left column are the same as in Figures 13 and 14 but restricted to the post-transition period for better comparability.*

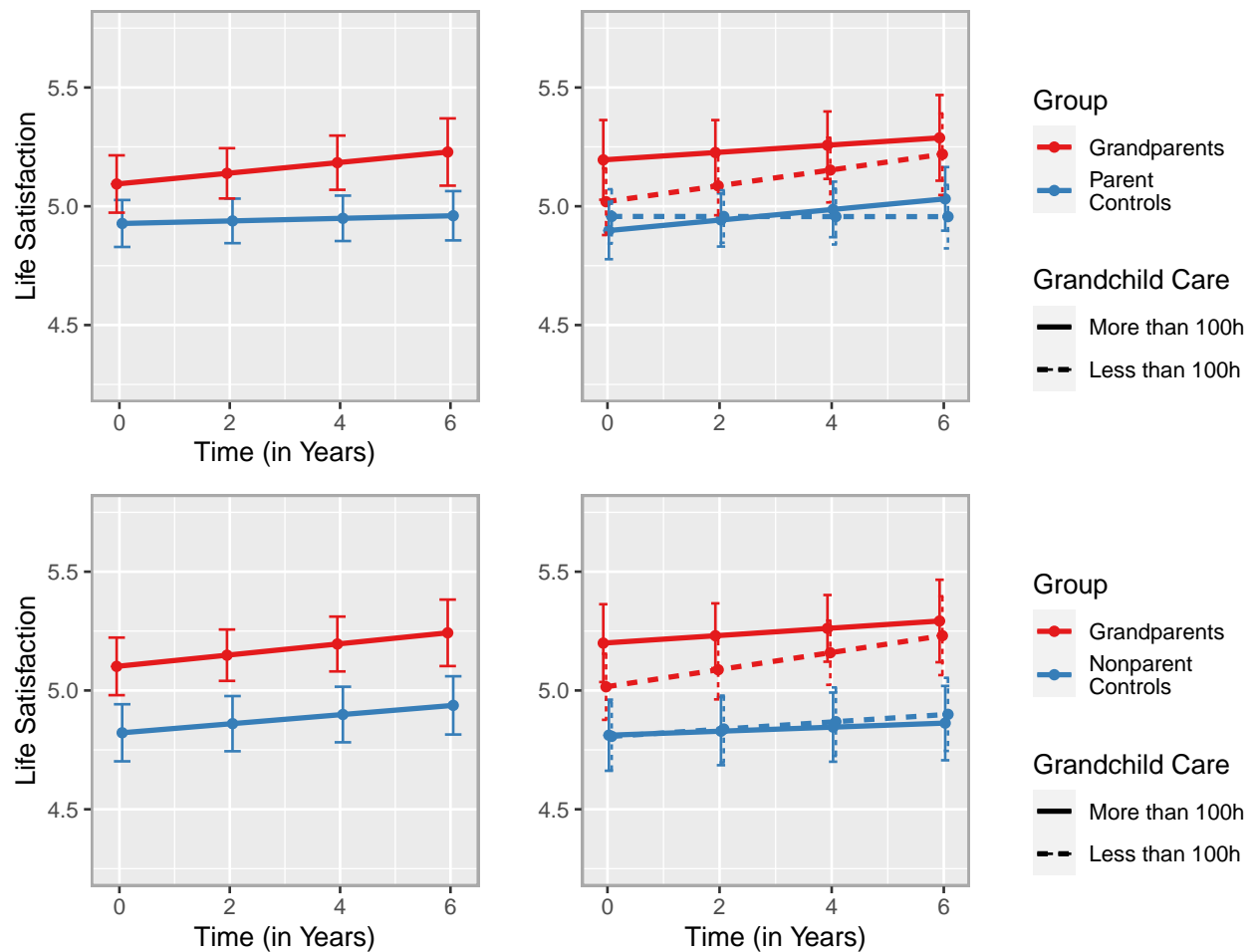


**LISS****HRS****Figure 16**

*Change trajectories of life satisfaction based on the basic models (1st column) and the models with the gender interaction (2nd column). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

**HRS****Figure 17**

*Change trajectories of life satisfaction based on the models of moderation by paid work (see Table 45). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The vertical line indicates the approximate time of the transition to grandparenthood.*

**HRS****Figure 18**

*Change trajectories of life satisfaction based on the models of moderation by grandchild care (see Table 47). The error bars are 95% confidence intervals of the predicted values which only account for the fixed-effects portion of the model. The plots in the left column are the same as in Figures 16 and 17 but restricted to the post-transition period for better comparability.*

## Supplemental Material

## 1220 Supplemental Tables

**Table S1***Intra-Class Correlations*

	A	C	E	N	O	LS
LISS: Parent controls						
$ICC_{pid}$	0.74	0.77	0.81	0.71	0.78	0.35
$ICC_{hid}$	0.05	0.01	0.02	0.07	0.00	0.37
$ICC_{pid/hid}$	0.79	0.78	0.83	0.78	0.78	0.71
LISS: Nonparent controls						
$ICC_{pid}$	0.76	0.76	0.64	0.67	0.79	0.32
$ICC_{hid}$	0.00	0.00	0.22	0.10	0.02	0.36
$ICC_{pid/hid}$	0.76	0.77	0.85	0.77	0.81	0.67
HRS: Parent controls						
$ICC_{pid}$	0.76	0.69	0.79	0.73	0.57	0.31
$ICC_{hid}$	0.00	0.07	0.00	0.01	0.21	0.35
$ICC_{pid/hid}$	0.76	0.76	0.79	0.74	0.78	0.67
HRS: Nonparent controls						
$ICC_{pid}$	0.71	0.73	0.77	0.76	0.59	0.33
$ICC_{hid}$	0.07	0.06	0.04	0.00	0.23	0.38
$ICC_{pid/hid}$	0.78	0.79	0.80	0.76	0.82	0.71

*Note.* A = agreeableness, C = conscientiousness, E = extraversion, N = neuroticism, O = openness, LS = life satisfaction. Intra-class correlations are the proportion of total variation that is explained by the respective blocking factor.  $ICC_{pid}$  is the proportion of total variance explained by nesting in respondents which corresponds to the correlation between two randomly selected observations from the same respondent.  $ICC_{hid}$  is the proportion of total variance explained by nesting in households which corresponds to the correlation between two randomly selected observations from the same household.  $ICC_{pid/hid}$  is the proportion of total variance explained by nesting in respondents and in households which corresponds to the correlation between two randomly selected observations from the same respondent and the same household.

Table S2

Longitudinal sample size in the analysis samples and coding scheme for the piecewise regression coefficients.

	Pre-transition years						Post-transition years						
	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
LISS: Analysis samples													
Grandparents: obs.	92	105	108	121	156	116	133	138	108	108	69	62	52
Grandparents: % women	51.09	48.57	52.78	51.24	56.41	62.93	47.37	52.90	51.85	50.00	56.52	66.13	53.85
Parent controls: obs.	335	425	381	540	740	351	450	488	333	394	365	164	201
Parent controls: % women	57.61	51.06	55.12	51.48	55.00	56.13	53.11	54.10	56.76	51.27	56.99	59.76	48.76
Nonparent controls: obs.	331	399	407	554	739	354	473	516	367	477	375	146	202
Nonparent controls: % women	52.57	54.89	57.99	52.71	55.21	54.52	49.26	54.46	52.86	52.83	54.67	48.63	51.49
LISS: Coding scheme													
Before-slope	0	1	2	3	4	5	5	5	5	5	5	5	5
After-slope	0	0	0	0	0	0	1	2	3	4	5	6	7
Jump	0	0	0	0	0	0	1	1	1	1	1	1	1
HRS: Analysis samples													
Grandparents: obs.	162	388	388	461	461	380	380	444	444	195	195	232	232
Grandparents: % women	57.41	54.12	54.12	55.53	55.53	53.95	53.95	55.41	55.41	56.41	56.41	53.45	53.45
Parent controls: obs.	619	1540	1540	1844	1844	1228	1228	1504	1504	658	658	864	864
Parent controls: % women	55.41	54.03	54.03	55.53	55.53	54.64	54.64	56.45	56.45	56.08	56.08	57.64	57.64
Nonparent controls: obs.	620	1541	1541	1844	1844	1205	1205	1448	1448	688	688	821	821
Nonparent controls: % women	56.45	54.06	54.06	55.53	55.53	56.10	56.10	58.91	58.91	57.56	57.56	60.54	60.54
HRS: Coding scheme													
Before-slope	0	1	1	2	2	2	2	2	2	2	2	2	2
After-slope	0	0	0	0	0	1	1	2	2	3	3	4	4
Jump	0	0	0	0	0	1	1	1	1	1	1	1	1

Note. obs. = observations. *time* = 0 marks the first year where the transition to grandparenthood has been reported. The number of grandparent participants is  $N_{LISS} = 250$  and  $N_{HRS} = 846$ .

Table S3

*Mean and Standard Deviation of the Big Five and Life Satisfaction over Time in the LISS Panel.*

	Pre-transition years						Post-transition years						
	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Agreeableness													
Grandparents	3.85 (0.52)	3.87 (0.50)	3.93 (0.46)	3.87 (0.49)	3.90 (0.54)	3.93 (0.47)	3.87 (0.49)	3.92 (0.52)	3.91 (0.52)	3.91 (0.51)	3.89 (0.52)	4.01 (0.49)	3.98 (0.37)
Parent controls	3.93 (0.52)	3.89 (0.51)	3.90 (0.47)	3.87 (0.50)	3.91 (0.48)	3.95 (0.48)	3.91 (0.47)	3.89 (0.51)	3.90 (0.53)	3.92 (0.48)	3.86 (0.50)	3.86 (0.43)	3.81 (0.43)
Nonparent controls	3.95 (0.47)	3.94 (0.50)	3.98 (0.45)	3.98 (0.50)	3.94 (0.49)	3.91 (0.47)	3.94 (0.44)	3.95 (0.45)	3.94 (0.46)	3.94 (0.47)	3.92 (0.41)	3.92 (0.44)	3.88 (0.42)
Conscientiousness													
Grandparents	3.76 (0.50)	3.84 (0.45)	3.74 (0.49)	3.75 (0.46)	3.77 (0.53)	3.79 (0.48)	3.77 (0.49)	3.78 (0.51)	3.75 (0.49)	3.79 (0.51)	3.84 (0.44)	3.74 (0.48)	3.76 (0.43)
Parent controls	3.80 (0.52)	3.78 (0.50)	3.80 (0.52)	3.77 (0.49)	3.79 (0.49)	3.83 (0.50)	3.82 (0.49)	3.79 (0.47)	3.80 (0.47)	3.79 (0.46)	3.78 (0.43)	3.76 (0.44)	3.77 (0.45)
Nonparent controls	3.77 (0.53)	3.79 (0.50)	3.76 (0.51)	3.80 (0.50)	3.74 (0.51)	3.75 (0.53)	3.77 (0.50)	3.72 (0.50)	3.82 (0.50)	3.81 (0.51)	3.78 (0.48)	3.84 (0.46)	3.80 (0.50)
Extraversion													
Grandparents	3.23 (0.66)	3.20 (0.74)	3.31 (0.54)	3.32 (0.58)	3.28 (0.64)	3.30 (0.57)	3.19 (0.61)	3.24 (0.69)	3.22 (0.65)	3.19 (0.60)	3.33 (0.60)	3.34 (0.58)	3.19 (0.55)
Parent controls	3.32 (0.58)	3.30 (0.59)	3.28 (0.58)	3.27 (0.59)	3.26 (0.59)	3.30 (0.59)	3.25 (0.64)	3.20 (0.62)	3.22 (0.59)	3.28 (0.61)	3.19 (0.58)	3.19 (0.53)	3.14 (0.56)
Nonparent controls	3.31 (0.74)	3.27 (0.70)	3.21 (0.79)	3.32 (0.75)	3.32 (0.69)	3.28 (0.70)	3.30 (0.72)	3.27 (0.73)	3.31 (0.77)	3.31 (0.78)	3.28 (0.73)	3.13 (0.75)	3.26 (0.74)
Neuroticism													
Grandparents	2.39 (0.71)	2.31 (0.64)	2.33 (0.60)	2.41 (0.64)	2.45 (0.65)	2.47 (0.71)	2.30 (0.67)	2.39 (0.76)	2.30 (0.68)	2.36 (0.66)	2.33 (0.67)	2.44 (0.80)	2.53 (0.67)
Parent controls	2.43 (0.59)	2.42 (0.63)	2.42 (0.56)	2.38 (0.58)	2.40 (0.58)	2.37 (0.60)	2.35 (0.63)	2.35 (0.65)	2.30 (0.56)	2.28 (0.56)	2.35 (0.60)	2.31 (0.55)	2.33 (0.56)
Nonparent controls	2.41 (0.64)	2.44 (0.63)	2.47 (0.69)	2.36 (0.70)	2.43 (0.69)	2.37 (0.63)	2.33 (0.69)	2.37 (0.71)	2.34 (0.74)	2.33 (0.68)	2.35 (0.70)	2.48 (0.82)	2.35 (0.83)

Table S3 continued

	Pre-transition years						Post-transition years						
	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Openness													
Grandparents	3.43 (0.51)	3.50 (0.50)	3.54 (0.49)	3.49 (0.45)	3.49 (0.49)	3.50 (0.50)	3.48 (0.48)	3.48 (0.54)	3.50 (0.43)	3.45 (0.46)	3.50 (0.50)	3.43 (0.53)	3.36 (0.56)
Parent controls	3.53 (0.52)	3.46 (0.52)	3.43 (0.50)	3.48 (0.53)	3.48 (0.51)	3.48 (0.51)	3.50 (0.52)	3.49 (0.50)	3.44 (0.48)	3.51 (0.48)	3.42 (0.49)	3.37 (0.48)	3.42 (0.42)
Nonparent controls	3.53 (0.52)	3.57 (0.51)	3.53 (0.51)	3.58 (0.52)	3.52 (0.52)	3.51 (0.51)	3.52 (0.51)	3.55 (0.51)	3.54 (0.52)	3.59 (0.51)	3.53 (0.50)	3.51 (0.47)	3.51 (0.53)
Life satisfaction													
Grandparents	5.18 (1.06)	5.29 (0.93)	5.23 (1.13)	5.16 (0.95)	5.28 (0.93)	5.24 (1.10)	5.31 (0.93)	5.24 (1.03)	5.37 (1.09)	5.38 (0.90)	5.39 (1.10)	5.25 (1.10)	5.15 (1.00)
Parent controls	5.21 (1.11)	5.30 (1.03)	5.26 (1.01)	5.23 (0.97)	5.28 (1.01)	5.29 (1.07)	5.36 (0.99)	5.25 (1.03)	5.26 (1.04)	5.45 (0.93)	5.33 (1.04)	5.40 (1.05)	5.41 (1.05)
Nonparent controls	5.27 (0.92)	5.19 (0.87)	5.10 (0.90)	5.21 (0.92)	5.26 (0.95)	5.18 (0.90)	5.24 (0.96)	5.09 (1.04)	5.10 (1.12)	5.07 (1.13)	5.23 (1.08)	4.98 (1.30)	5.19 (1.18)

*Note.* Standard deviation shown in brackets; *time* = 0 marks the first year where the transition to grandparenthood has been reported.

**Table S4***Mean and Standard Deviation of the Big Five and Life Satisfaction over Time in the HRS.*

	Pre-transition years						Post-transition years						
	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Agreeableness													
Grandparents	3.46 (0.47)	3.51 (0.48)	3.51 (0.49)	3.51 (0.49)	3.52 (0.49)	3.52 (0.49)	3.52 (0.49)	3.52 (0.48)	3.52 (0.48)	3.50 (0.53)	3.50 (0.53)	3.56 (0.44)	3.56 (0.44)
Parent controls	3.50 (0.48)	3.48 (0.49)	3.50 (0.46)	3.50 (0.46)	3.49 (0.50)	3.49 (0.50)	3.49 (0.50)	3.49 (0.48)	3.49 (0.48)	3.44 (0.52)	3.44 (0.52)	3.47 (0.51)	3.47 (0.51)
Nonparent controls	3.50 (0.50)	3.50 (0.50)	3.50 (0.51)	3.50 (0.51)	3.52 (0.50)	3.52 (0.50)	3.52 (0.50)	3.52 (0.50)	3.52 (0.50)	3.44 (0.53)	3.44 (0.53)	3.48 (0.53)	3.48 (0.53)
Conscientiousness													
Grandparents	3.47 (0.46)	3.46 (0.45)	3.47 (0.44)	3.47 (0.44)	3.46 (0.45)	3.46 (0.45)	3.46 (0.45)	3.45 (0.44)	3.45 (0.44)	3.44 (0.43)	3.44 (0.43)	3.49 (0.44)	3.49 (0.44)
Parent controls	3.45 (0.45)	3.45 (0.45)	3.45 (0.45)	3.45 (0.45)	3.47 (0.45)	3.47 (0.45)	3.47 (0.45)	3.46 (0.46)	3.46 (0.46)	3.43 (0.50)	3.43 (0.50)	3.44 (0.50)	3.44 (0.50)
Nonparent controls	3.50 (0.44)	3.48 (0.44)	3.49 (0.44)	3.49 (0.44)	3.50 (0.42)	3.50 (0.42)	3.50 (0.42)	3.48 (0.45)	3.48 (0.45)	3.46 (0.45)	3.46 (0.45)	3.49 (0.43)	3.49 (0.43)
Extraversion													
Grandparents	3.15 (0.56)	3.22 (0.56)	3.20 (0.54)	3.20 (0.54)	3.21 (0.56)	3.21 (0.56)	3.21 (0.56)	3.19 (0.58)	3.19 (0.58)	3.22 (0.59)	3.22 (0.59)	3.22 (0.58)	3.22 (0.58)
Parent controls	3.20 (0.51)	3.18 (0.56)	3.19 (0.54)	3.19 (0.54)	3.21 (0.54)	3.21 (0.54)	3.21 (0.54)	3.21 (0.54)	3.21 (0.54)	3.17 (0.55)	3.17 (0.55)	3.19 (0.56)	3.19 (0.56)
Nonparent controls	3.19 (0.55)	3.20 (0.54)	3.20 (0.56)	3.20 (0.56)	3.23 (0.54)	3.23 (0.54)	3.23 (0.54)	3.22 (0.54)	3.22 (0.54)	3.23 (0.56)	3.23 (0.56)	3.24 (0.57)	3.24 (0.57)
Neuroticism													
Grandparents	2.00 (0.56)	1.97 (0.63)	2.06 (0.62)	2.06 (0.62)	1.91 (0.60)	1.91 (0.60)	1.91 (0.60)	1.96 (0.58)	1.96 (0.58)	1.91 (0.59)	1.91 (0.59)	1.91 (0.61)	1.91 (0.61)
Parent controls	2.01 (0.59)	2.05 (0.60)	2.01 (0.59)	2.01 (0.59)	2.03 (0.61)	2.03 (0.61)	2.03 (0.61)	2.00 (0.61)	2.00 (0.61)	2.01 (0.61)	2.01 (0.61)	1.95 (0.60)	1.95 (0.60)
Nonparent controls	2.05 (0.56)	2.00 (0.58)	2.02 (0.60)	2.02 (0.60)	1.92 (0.57)	1.92 (0.57)	1.92 (0.57)	1.97 (0.59)	1.97 (0.59)	1.84 (0.55)	1.84 (0.55)	1.90 (0.58)	1.90 (0.58)



Table S4 continued

	Pre-transition years						Post-transition years						
	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
Openness													
Grandparents	3.00 (0.51)		3.02 (0.53)		3.04 (0.51)		3.01 (0.52)		3.00 (0.52)		2.96 (0.59)		3.04 (0.51)
Parent controls	3.03 (0.51)		3.00 (0.56)		2.98 (0.54)		3.03 (0.54)		3.00 (0.52)		2.96 (0.58)		2.96 (0.56)
Nonparent controls	3.06 (0.54)		3.05 (0.53)		3.05 (0.55)		3.07 (0.54)		3.06 (0.55)		3.02 (0.57)		3.04 (0.57)
Life satisfaction													
Grandparents	5.14 (1.44)		5.08 (1.45)		5.15 (1.46)		5.17 (1.40)		5.16 (1.44)		5.29 (1.38)		5.28 (1.50)
Parent controls	5.14 (1.52)		4.98 (1.57)		5.01 (1.57)		5.11 (1.52)		5.10 (1.53)		5.06 (1.47)		5.12 (1.47)
Nonparent controls	5.10 (1.49)		5.14 (1.50)		5.09 (1.52)		5.26 (1.44)		5.21 (1.51)		5.40 (1.30)		5.40 (1.36)

*Note.* Standard deviation shown in brackets; *time* = 0 marks the first year where the transition to grandparenthood has been reported.

Table S5

*Standardized Difference in Means for Covariates Used in Propensity Score Matching and the Propensity Score in the LISS panel.*

Covariate	Description	Raw variable	Parent control group		Nonparent control group	
			Before PSM	After PSM	Before PSM	After PSM
pscore	Propensity score	/	1.14	0.02	1.34	0.04
female	Gender (f.=1, m.=0)	geslacht	0.05	0.00	0.05	0.00
age	Age	gebjaar	0.85	-0.10	4.05	-0.01
degreehighsec	Higher secondary/preparatory university education	oplmet	0.07	-0.06	-0.07	0.12
degreevocational	Intermediate vocational education	oplmet	-0.20	-0.06	-0.02	0.00
degreecollege	Higher vocational education	oplmet	0.00	0.05	0.02	-0.09
degreenuiversity	University degree	oplmet	-0.08	0.14	-0.15	-0.05
religion	Member of religion/church	cr*012	0.10	0.08	0.33	0.07
speakdutch	Dutch spoken at home (primarily)	cr*089	-0.02	-0.06	0.00	-0.02
divorced	Divorced (marital status)	burgstat	0.02	-0.03	0.29	-0.02
widowed	Widowed (marital status)	burgstat	0.09	-0.12	0.13	-0.07
livetogether	Live together with partner	cf*025	-0.08	0.04	1.05	-0.02
rooms	Rooms in dwelling	cd*034	-0.03	0.05	0.63	-0.11
logincome	Personal net monthly income in Euros (logarithm)	nettoink	-0.01	0.04	0.59	-0.14
rental	Live for rent (vs. self-owned dwelling)	woning	-0.08	-0.09	-0.47	-0.03
financialsit	Financial situation of household (scale from 1-5)	ci*252	0.08	0.00	-0.03	0.00
jobhours	Average work hours per week	cw*127	0.02	0.08	0.11	-0.04
mobility	Mobility problems (walking, staircase, shopping)	ch*023/027/041	0.07	0.04	0.09	-0.02
dep	Depression items from Mental Health Inventory	ch*011 - ch*015	-0.01	0.08	-0.22	-0.08
betterhealth	Poor/moderate health status (ref.: good)	ch*004	0.00	-0.01	-0.26	0.07
worsehealth	Very good/excellent health status (ref.: good)	ch*004	0.04	-0.02	0.11	-0.04
totalchildren	Number living children	cf*455 / cf*036	0.25	0.02	NA	NA
totalresidentkids	Number of living-at-home children in household	aantalki	-0.71	0.02	NA	NA
secondkid	Has two or more children	cf*455 / cf*036	0.20	0.04	NA	NA
thirdkid	Has three or more children	cf*455 / cf*036	0.26	0.01	NA	NA
kid1female	Gender of first child (f.=1, m.=0)	cf*068	0.04	0.04	NA	NA
kid2female	Gender of second child (f.=1, m.=0)	cf*069	0.01	-0.06	NA	NA
kid3female	Gender of third child (f.=1, m.=0)	cf*070	0.17	0.02	NA	NA
kid1age	Age of first child	cf*456 / cf*037	1.70	-0.17	NA	NA
kid2age	Age of second child	cf*457 / cf*038	0.87	-0.01	NA	NA

Table S5 continued

Covariate	Description	Raw variable	Parent control group		Nonparent control group	
			Before PSM	After PSM	Before PSM	After PSM
kid3age	Age of third child	cf*458 / cf*039	0.40	0.01	NA	NA
kid1home	First child living at home	cf*083	-1.56	0.05	NA	NA
kid2home	Second child living at home	cf*084	-1.05	0.04	NA	NA
kid3home	Third child living at home	cf*085	-0.05	0.00	NA	NA
swls	Satisfaction with Life Scale	cp*014 - cp*018	0.10	-0.03	0.25	-0.06
agree	Agreeableness	cp*021 - cp*066	0.05	-0.01	0.13	-0.13
con	Conscientiousness	cp*022 - cp*067	-0.06	-0.05	0.16	0.00
extra	Extraversion	cp*020 - cp*065	0.05	0.02	0.02	-0.07
neur	Neuroticism	cp*023 - cp*068	-0.02	0.02	-0.26	0.03
open	Openness	cp*024 - cp*069	0.06	0.05	-0.16	-0.08
participation	Waves participated	/	-0.27	-0.09	0.09	-0.03
year	Year of assessment	wave	-0.23	-0.07	0.08	-0.06

*Note.* PSM = propensity score matching, ref. = reference category, f. = female, m. = male, NA = covariate not used in this sample. The standardized difference in means between the grandparent and the two control groups (parent and nonparent) was computed by  $(\bar{x}_{gp} - \bar{x}_c)/(\hat{\sigma}_{gp})$ . Rules of thumb say that this measure should ideally be below .25 (Stuart, 2010) or below .10 (Austin, 2011).

Table S6

Standardized Difference in Means for Covariates Used in Propensity Score Matching and the Propensity Score in the HRS.

Covariate	Description	Raw variable	Parent control group		Nonparent control group	
			Before PSM	After PSM	Before PSM	After PSM
pscore	Propensity score	/	0.92	0.01	1.45	0.00
female	Gender (f.=1, m.=0)	RAGENDER	-0.07	0.00	0.01	0.00
age	Age	RABYEAR	-0.46	-0.01	-1.02	0.11
schlyrs	Years of education	RAEDYRS	0.11	0.03	0.25	-0.04
religyear	Religious attendance: yearly	*B082	0.04	0.01	0.13	0.00
religmonth	Religious attendance: monthly	*B082	0.01	-0.02	0.10	0.05
religweek	Religious attendance: weekly	*B082	0.06	0.02	0.04	0.03
religmore	Religious attendance: more	*B082	0.09	-0.04	0.06	-0.01
notusaborn	Not born in the US	*Z230	-0.05	0.03	0.13	-0.02
black	Race: black/african american (ref.: white)	RARACEM	-0.13	-0.08	-0.22	0.01
raceother	Race: other (ref.: white)	RARACEM	-0.09	-0.06	0.01	-0.05
divorced	Divorced (marital status)	R*MSTAT	-0.06	0.01	0.01	0.03
widowed	Widowed (marital status)	R*MSTAT	-0.31	0.02	-0.41	0.04
livetogether	Live together with partner	*A030 / *XF065_R	0.25	-0.02	1.05	-0.04
roomslessthree	Number of rooms (in housing unit)	*H147 / *066	-0.15	-0.05	-0.59	-0.01
roomsfourfive	Number of rooms (in housing unit)	*H147 / *066	0.00	-0.02	-0.25	-0.03
roomsmoreeight	Number of rooms (in housing unit)	*H147 / *066	0.07	-0.03	0.28	0.00
loghhincome	Household income (logarithm)	*ITOT	0.03	0.03	0.41	0.00
loghhwealth	Household wealth (logarithm)	*ATOTB	0.07	0.05	0.34	-0.02
renter	Live for rent (vs. self-owned dwelling)	*H004	-0.10	-0.08	-0.51	-0.02
jobhours	Hours worked/week main job	R*JHOURS	0.25	0.08	0.59	0.00
paidwork	Working for pay	*J020	0.28	0.07	0.62	-0.04
mobilitydiff	Difficulty in mobility rated from 0-5	R*MOBILA	-0.16	-0.04	-0.52	0.00
cesd	CESD score (depression)	R*CESD	-0.13	-0.04	-0.26	-0.04
conde	Sum of health conditions	R*CONDE	-0.22	-0.03	-0.51	0.04
healthexcellent	Self-report of health - excellent (ref: good)	R*SHLT	0.05	0.02	0.15	-0.03
healthverygood	Self-report of health - very good (ref: good)	R*SHLT	0.23	0.02	0.31	-0.02
healthfair	Self-report of health - fair (ref: good)	R*SHLT	-0.16	-0.02	-0.29	0.00
healthpoor	Self-report of health - poor (ref: good)	R*SHLT	-0.07	-0.03	-0.24	0.02
totalnonresidentkids	Number of nonresident kids	*A100	0.66	-0.05	NA	NA
totalresidentkids	Number of resident children	*A099	-0.22	0.00	NA	NA
secondkid	Has two or more children	KIDID	0.52	-0.03	NA	NA

Table S6 continued

Covariate	Description	Raw variable	Parent control group		Nonparent control group	
			Before PSM	After PSM	Before PSM	After PSM
thirdkid	Has three or more children	KIDID	0.38	-0.03	NA	NA
kid1female	Gender of first child (f.=1, m.=0)	KAGENDERBG	0.11	0.03	NA	NA
kid2female	Gender of second child (f.=1, m.=0)	KAGENDERBG	0.17	-0.01	NA	NA
kid3female	Gender of third child (f.=1, m.=0)	KAGENDERBG	0.24	0.02	NA	NA
kid1age	Age of first child	KABYEARBG	-0.35	-0.02	NA	NA
kid2age	Age of second child	KABYEARBG	0.36	-0.03	NA	NA
kid3age	Age of third child	KABYEARBG	0.35	-0.01	NA	NA
kid1educ	Education of first child (years)	KAEDUC	0.30	0.02	NA	NA
kid2educ	Education of second child (years)	KAEDUC	0.57	0.00	NA	NA
kid3educ	Education of third child (years)	KAEDUC	0.40	-0.02	NA	NA
childrenclose	Children live within 10 miles	*E012	0.14	0.01	NA	NA
siblings	Number of living siblings	R*LIVSIB	0.05	-0.04	0.21	0.03
swls	Satisfaction with Life Scale	*LB003*	0.17	0.08	0.30	0.00
agree	Agreeableness	*LB033*	0.06	0.04	0.11	0.02
con	Conscientiousness	*LB033*	0.14	0.04	0.26	-0.04
extra	Extraversion	*LB033*	0.04	0.04	0.18	0.01
neur	Neuroticism	*LB033*	-0.06	0.00	-0.04	0.01
open	Openness	*LB033*	0.04	0.07	0.05	-0.04
participation	Waves participated (2006-2018)	/	-0.36	-0.01	-0.26	-0.04
interviewyear	Date of interview - year	*A501	-0.33	-0.05	-0.18	-0.05

*Note.* PSM = propensity score matching, ref. = reference category, f. = female, m. = male, NA = covariate not used in this sample. The standardized difference in means between the grandparent and the two control groups (parent and nonparent) was computed by  $(\bar{x}_{gp} - \bar{x}_c)/(\hat{\sigma}_{gp})$ . Rules of thumb say that this measure should ideally be below .25 (Stuart, 2010) or below .10 (Austin, 2011).

Table S7

*Tests of Heterogeneous Random Slope Variance Models for Agreeableness Against Comparison Models*

*With a Uniform Random Slope Variance.*

	Parent controls					Nonparent controls				
	Var.	SD	LR	p	GP greater	Var.	SD	LR	p	GP greater
LISS										
Before-slope: uniform	0.00	0.04				0.00	0.04			
Before-slope: heterogeneous (controls)	0.00	0.05				0.00	0.05			
Before-slope: heterogeneous (grandparents)	0.00	0.04	9.72	.021	no	0.00	0.03	17.01	< .001	no
After-slope: uniform	0.00	0.04				0.00	0.04			
After-slope: heterogeneous (controls)	0.00	0.04				0.00	0.04			
After-slope: heterogeneous (grandparents)	0.00	0.03	3.34	.343	no	0.00	0.03	9.22	.026	no
Shift: uniform	0.03	0.16				0.02	0.15			
Shift: heterogeneous (controls)	0.03	0.17				0.03	0.16			
Shift: heterogeneous (grandparents)	0.02	0.13	3.79	.285	no	0.01	0.12	7.32	.062	no
HRS										
Before-slope: uniform	0.01	0.12				0.01	0.12			
Before-slope: heterogeneous (controls)	0.02	0.15				0.02	0.15			
Before-slope: heterogeneous (grandparents)	0.01	0.12	75.87	< .001	no	0.02	0.14	82.20	< .001	no
After-slope: uniform	0.01	0.10				0.01	0.11			
After-slope: heterogeneous (controls)	0.01	0.11				0.02	0.13			
After-slope: heterogeneous (grandparents)	0.01	0.08	37.85	< .001	no	0.01	0.09	69.06	< .001	no
Shift: uniform	0.06	0.25				0.07	0.26			
Shift: heterogeneous (controls)	0.08	0.28				0.09	0.29			
Shift: heterogeneous (grandparents)	0.05	0.22	68.99	< .001	no	0.06	0.24	91.90	< .001	no

*Note.* The heterogeneous variance models ( $df = 16$ ) differ only in the random effects from the comparison models ( $df = 13$ ). In addition to two random slope variances (instead of one), the heterogeneous variance models estimate two additional random intercept/slope covariances. Both models estimate heterogeneous random intercept variances for the grandparent and control groups.  $Var.$  = random slope variance;  $SD$  = standard deviation;  $LR$  = likelihood ratio;  $p$  = p-value (of the LR test);  $GP$  greater = indicating if the random slope variance of the grandparents is larger than that of either control group.

Table S8

*Tests of Heterogeneous Random Slope Variance Models for Conscientiousness Against Comparison Models With a Uniform Random Slope Variance.*

	Parent controls				Nonparent controls			
	Var.	SD	LR	p	Var.	SD	LR	p
LISS								
Before-slope: uniform	0.00	0.04			0.00	0.04		
Before-slope: heterogeneous (controls)	0.00	0.05			0.00	0.05		
Before-slope: heterogeneous (grandparents)	0.00	0.02	45.09	< .001	no	no	26.46	< .001
After-slope: uniform	0.00	0.04			0.00	0.04		
After-slope: heterogeneous (controls)	0.00	0.05			0.00	0.04		
After-slope: heterogeneous (grandparents)	0.00	0.03	18.06	< .001	no	no	8.69	.034
Shift: uniform	0.03	0.16			0.02	0.14		
Shift: heterogeneous (controls)	0.04	0.19			0.02	0.16		
Shift: heterogeneous (grandparents)	0.02	0.12	21.47	< .001	no	no	8.86	.031
HRS								
Before-slope: uniform	0.01	0.11			0.01	0.11		
Before-slope: heterogeneous (controls)	0.02	0.14			0.02	0.14		
Before-slope: heterogeneous (grandparents)	0.01	0.11	92.92	< .001	no	no	103.88	< .001
After-slope: uniform	0.01	0.10			0.01	0.10		
After-slope: heterogeneous (controls)	0.01	0.11			0.01	0.12		
After-slope: heterogeneous (grandparents)	0.01	0.09	61.33	< .001	no	no	77.41	< .001
Shift: uniform	0.06	0.24			0.06	0.25		
Shift: heterogeneous (controls)	0.07	0.27			0.08	0.28		
Shift: heterogeneous (grandparents)	0.06	0.23	83.05	< .001	no	no	97.85	< .001

*Note.* The heterogeneous variance models ( $df = 16$ ) differ only in the random effects from the comparison models ( $df = 13$ ). In addition to two random slope variances (instead of one), the heterogeneous variance models estimate two additional random intercept/slope covariances. Both models estimate heterogeneous random intercept variances for the grandparent and control groups.  $Var.$  = random slope variance;  $SD$  = standard deviation;  $LR$  = likelihood ratio;  $p$  = p-value (of the LR test);  $GP$  greater = indicating if the random slope variance of the grandparents is larger than that of either control group.

Table S9

*Tests of Heterogeneous Random Slope Variance Models for Extraversion Against Comparison Models*

*With a Uniform Random Slope Variance.*

	Parent controls					Nonparent controls				
	Var.	SD	LR	p	GP greater	Var.	SD	LR	p	GP greater
LISS										
Before-slope: uniform	0.00	0.05				0.00	0.05			
Before-slope: heterogeneous (controls)	0.00	0.06				0.00	0.06			
Before-slope: heterogeneous (grandparents)	0.00	0.04	14.67	.002	no	0.00	0.04	25.96	< .001	no
After-slope: uniform	0.00	0.04				0.00	0.05			
After-slope: heterogeneous (controls)	0.00	0.04				0.00	0.05			
After-slope: heterogeneous (grandparents)	0.00	0.03	7.37	.061	no	0.00	0.03	13.50	.004	no
Shift: uniform	0.03	0.17				0.03	0.18			
Shift: heterogeneous (controls)	0.04	0.19				0.04	0.21			
Shift: heterogeneous (grandparents)	0.01	0.12	11.13	.011	no	0.02	0.13	13.00	.005	no
HRS										
Before-slope: uniform	0.02	0.12				0.01	0.12			
Before-slope: heterogeneous (controls)	0.02	0.15				0.02	0.14			
Before-slope: heterogeneous (grandparents)	0.01	0.12	59.59	< .001	no	0.02	0.13	61.85	< .001	no
After-slope: uniform	0.01	0.10				0.01	0.12			
After-slope: heterogeneous (controls)	0.01	0.11				0.02	0.14			
After-slope: heterogeneous (grandparents)	0.01	0.09	27.05	< .001	no	0.01	0.10	61.55	< .001	no
Shift: uniform	0.07	0.26				0.08	0.29			
Shift: heterogeneous (controls)	0.08	0.29				0.10	0.32			
Shift: heterogeneous (grandparents)	0.06	0.25	44.54	< .001	no	0.07	0.26	70.11	< .001	no

*Note.* The heterogeneous variance models ( $df = 16$ ) differ only in the random effects from the comparison models ( $df = 13$ ). In addition to two random slope variances (instead of one), the heterogeneous variance models estimate two additional random intercept/slope covariances. Both models estimate heterogeneous random intercept variances for the grandparent and control groups.  $Var.$  = random slope variance;  $SD$  = standard deviation;  $LR$  = likelihood ratio;  $p$  = p-value (of the LR test);  $GP$  greater = indicating if the random slope variance of the grandparents is larger than that of either control group.



Table S10

*Tests of Heterogeneous Random Slope Variance Models for Neuroticism Against Comparison Models With a Uniform Random Slope Variance.*

	Parent controls				Nonparent controls					
	Var.	SD	LR	p	GP greater	Var.	SD	LR	p	GP greater
LISS										
Before-slope: uniform	0.00	0.06				0.00	0.07			
Before-slope: heterogeneous (controls)	0.00	0.06				0.01	0.08			
Before-slope: heterogeneous (grandparents)	0.00	0.06	3.74	.291	yes	0.00	0.06	19.38	< .001	no
After-slope: uniform	0.00	0.05				0.00	0.06			
After-slope: heterogeneous (controls)	0.00	0.05				0.00	0.07			
After-slope: heterogeneous (grandparents)	0.00	0.05	1.09	.781	no	0.00	0.05	6.22	.101	no
Shift: uniform	0.04	0.20				0.06	0.24			
Shift: heterogeneous (controls)	0.04	0.20				0.07	0.26			
Shift: heterogeneous (grandparents)	0.04	0.21	3.32	.344	yes	0.05	0.21	3.27	.352	no
HRS										
Before-slope: uniform	0.02	0.15				0.02	0.15			
Before-slope: heterogeneous (controls)	0.03	0.19				0.03	0.18			
Before-slope: heterogeneous (grandparents)	0.03	0.17	95.90	< .001	no	0.03	0.18	73.45	< .001	yes
After-slope: uniform	0.01	0.12				0.02	0.12			
After-slope: heterogeneous (controls)	0.02	0.13				0.02	0.15			
After-slope: heterogeneous (grandparents)	0.01	0.10	79.78	< .001	no	0.01	0.11	101.07	< .001	no
Shift: uniform	0.10	0.31				0.10	0.32			
Shift: heterogeneous (controls)	0.13	0.35				0.13	0.36			
Shift: heterogeneous (grandparents)	0.09	0.29	116.36	< .001	no	0.09	0.30	116.43	< .001	no

*Note.* The heterogeneous variance models ( $df = 16$ ) differ only in the random effects from the comparison models ( $df = 13$ ). In addition to two random slope variances (instead of one), the heterogeneous variance models estimate two additional random intercept/slope covariances. Both models estimate heterogeneous random intercept variances for the grandparent and control groups. *Var.* = random slope variance; *SD* = standard deviation; *LR* = likelihood ratio; *p* = p-value (of the LR test); *GP greater* = indicating if the random slope variance of the grandparents is larger than that of either control group.

Table S11

*Tests of Heterogeneous Random Slope Variance Models for Openness Against Comparison Models With a Uniform Random Slope Variance.*

	Parent controls					Nonparent controls				
	Var.	SD	LR	p	GP greater	Var.	SD	LR	p	GP greater
LISS										
Before-slope: uniform	0.00	0.04				0.00	0.03			
Before-slope: heterogeneous (controls)	0.00	0.05				0.00	0.04			
Before-slope: heterogeneous (grandparents)	0.00	0.04	19.82	< .001	no	0.00	0.04	25.90	< .001	yes
After-slope: uniform	0.00	0.04				0.00	0.03			
After-slope: heterogeneous (controls)	0.00	0.05				0.00	0.03			
After-slope: heterogeneous (grandparents)	0.00	0.02	26.80	< .001	no	0.00	0.02	9.20	.027	no
Shift: uniform	0.03	0.16				0.02	0.13			
Shift: heterogeneous (controls)	0.03	0.18				0.02	0.14			
Shift: heterogeneous (grandparents)	0.01	0.10	17.96	< .001	no	0.02	0.12	10.36	.016	no
HRS										
Before-slope: uniform	0.01	0.11				0.01	0.12			
Before-slope: heterogeneous (controls)	0.02	0.14				0.02	0.14			
Before-slope: heterogeneous (grandparents)	0.01	0.09	55.99	< .001	no	0.02	0.14	50.54	< .001	no
After-slope: uniform	0.01	0.10				0.01	0.11			
After-slope: heterogeneous (controls)	0.01	0.11				0.02	0.13			
After-slope: heterogeneous (grandparents)	0.01	0.09	37.59	< .001	no	0.01	0.10	50.64	< .001	no
Shift: uniform	0.07	0.26				0.07	0.27			
Shift: heterogeneous (controls)	0.08	0.28				0.09	0.30			
Shift: heterogeneous (grandparents)	0.06	0.24	58.39	< .001	no	0.07	0.26	67.21	< .001	no

*Note.* The heterogeneous variance models ( $df = 16$ ) differ only in the random effects from the comparison models ( $df = 13$ ). In addition to two random slope variances (instead of one), the heterogeneous variance models estimate two additional random intercept/slope covariances. Both models estimate heterogeneous random intercept variances for the grandparent and control groups.  $Var.$  = random slope variance;  $SD$  = standard deviation;  $LR$  = likelihood ratio;  $p$  = p-value (of the LR test);  $GP$  greater = indicating if the random slope variance of the grandparents is larger than that of either control group.

Table S12

Tests of Heterogeneous Random Slope Variance Models for Life Satisfaction Against Comparison Models With a Uniform Random Slope Variance.

	Parent controls				Nonparent controls					
	Var.	SD	LR	p	GP greater	Var.	SD	LR	p	GP greater
LISS										
Before-slope: uniform	0.01	0.11				0.01	0.10			
Before-slope: heterogeneous (controls)	0.02	0.13				0.01	0.12			
Before-slope: heterogeneous (grandparents)	0.02	0.14	41.47	< .001	yes	0.01	0.12	21.10	< .001	no
After-slope: uniform	0.01	0.11				0.01	0.12			
After-slope: heterogeneous (controls)	0.01	0.10				0.01	0.12			
After-slope: heterogeneous (grandparents)	0.02	0.13	11.74	.008	yes	0.02	0.12	5.26	.154	yes
Shift: uniform	0.20	0.45				0.18	0.42			
Shift: heterogeneous (controls)	0.19	0.44				0.17	0.41			
Shift: heterogeneous (grandparents)	0.25	0.50	10.00	.019	yes	0.21	0.46	4.50	.212	yes
HRS										
Before-slope: uniform	0.14	0.37				0.14	0.37			
Before-slope: heterogeneous (controls)	0.28	0.53				0.22	0.47			
Before-slope: heterogeneous (grandparents)	0.26	0.50	140.31	< .001	no	0.34	0.58	111.97	< .001	yes
After-slope: uniform	0.10	0.32				0.14	0.37			
After-slope: heterogeneous (controls)	0.13	0.36				0.21	0.46			
After-slope: heterogeneous (grandparents)	0.08	0.28	93.14	< .001	no	0.10	0.32	108.41	< .001	no
Shift: uniform	0.83	0.91				0.93	0.96			
Shift: heterogeneous (controls)	1.07	1.04				1.24	1.11			
Shift: heterogeneous (grandparents)	0.80	0.89	172.53	< .001	no	0.91	0.96	153.16	< .001	no

Note. The heterogeneous variance models ( $df = 16$ ) differ only in the random effects from the comparison models ( $df = 13$ ). In addition to two random slope variances (instead of one), the heterogeneous variance models estimate two additional random intercept/slope covariances. Both models estimate heterogeneous random intercept variances for the grandparent and control groups.  $Var.$  = random slope variance;  $SD$  = standard deviation;  $LR$  = likelihood ratio;  $p$  = p-value (of the LR test);  $GP$  greater = indicating if the random slope variance of the grandparents is larger than that of either control group.

**Table S13***Rank-order stability.*

Outcome	Parent controls			Nonparent controls		
	$Cor_{all}$	$Cor_{GP}$	$Cor_{con}$	$Cor_{all}$	$Cor_{GP}$	$Cor_{con}$
LISS						
Agreeableness	0.80	0.81	0.80	0.75	0.81	0.74
Conscientiousness	0.77	0.80	0.76	0.79	0.80	0.79
Extraversion	0.82	0.87	0.81	0.87	0.87	0.87
Neuroticism	0.71	0.76	0.69	0.78	0.76	0.79
Openness	0.75	0.78	0.74	0.78	0.78	0.78
Life Satisfaction	0.72	0.72	0.72	0.70	0.72	0.69
HRS						
Agreeableness	0.68	0.70	0.67	0.73	0.70	0.74
Conscientiousness	0.71	0.69	0.72	0.70	0.69	0.70
Extraversion	0.72	0.75	0.71	0.74	0.75	0.74
Neuroticism	0.66	0.71	0.65	0.68	0.71	0.67
Openness	0.69	0.73	0.67	0.76	0.73	0.76
Life Satisfaction	0.51	0.55	0.50	0.55	0.55	0.55

*Note.* Correlations as indicators of rank-order stability and p-values of the

interactions between each outcome at the last pre-transition assessment and the

*grandparent* variable in regression models predicting the first available post-transition

assessment. The average time lags in years between these two assessments are 2.36

( $SD = 0.68$ ) for the LISS parent sample, 2.37 ( $SD = 0.69$ ) for the LISS nonparent

sample, 4.15 ( $SD = 0.77$ ) for the HRS parent sample, and 4.11 ( $SD = 0.67$ ) for the

HRS nonparent sample.  $Cor_{all}$  = rank-order stability;  $Cor_{GP}$  = rank-order stability

(only grandparents);  $Cor_{con}$  = rank-order stability (only controls).



**1233 Supplemental Figures**

## Complete Software and Session Information

We used R (Version 4.0.4; R Core Team, 2021) and the R-packages *car* (Version 3.0.10; Fox et al., 2020a, 2020b; Yentes & Wilhelm, 2018), *carData* (Version 3.0.4; Fox et al., 2020b), *careless* (Version 1.1.3; Yentes & Wilhelm, 2018), *citr* (Version 0.3.2; Aust, 2019), *corrplot2017* (Wei & Simko, 2017), *cowplot* (Version 1.1.0; Wilke, 2020), *dplyr* (Version 1.0.2; Wickham, François, et al., 2020), *effects* (Version 4.2.0; Fox & Weisberg, 2018; Fox, 2003; Fox & Hong, 2009), *forcats* (Version 0.5.0; Wickham, 2020a), *foreign* (Version 0.8.81; R Core Team, 2020), *ggplot2* (Version 3.3.4; Wickham, 2016), *GPArotation* (Version 2014.11.1; Bernaards & I.Jennrich, 2005), *interactions* (Version 1.1.3; Long, 2019), *jtools* (Version 2.1.1; Long, 2020), *knitr* (Version 1.30; Xie, 2015), *lme4* (Version 1.1.26; Bates et al., 2015), *lmerTest* (Version 3.1.3; Kuznetsova et al., 2017), *magick* (Version 2.6.0; Ooms, 2021), *MatchIt* (Version 4.1.0; Ho et al., 2020), *Matrix* (Version 1.3.2; Bates & Maechler, 2021), *papaja* (Version 0.1.0.9997; Aust & Barth, 2020), *patchwork* (Version 1.1.0.9000; Pedersen, 2020), *png* (Version 0.1.7; Urbanek, 2013), *psych* (Version 2.0.9; Revelle, 2020), *purrr* (Version 0.3.4; Henry & Wickham, 2020), *readr* (Version 1.4.0; Wickham & Hester, 2020), *robustlmm* (Version 2.3; Koller, 2016), *scales* (Version 1.1.1; Wickham & Seidel, 2020), *stringr* (Version 1.4.0; Wickham, 2019), *tibble* (Version 3.1.2; Müller & Wickham, 2020), *tidyr* (Version 1.1.2; Wickham, 2020b), *tidyverse* (Version 1.3.0; Wickham, Averick, et al., 2019), and *tinylabels* (Version 0.1.0; Barth, 2020) for data wrangling, analyses, and plots.

The following is the output of R's *sessionInfo()* command, which shows information to aid analytic reproducibility of the analyses.

R version 4.0.4 (2021-02-15) Platform: x86\_64-apple-darwin17.0 (64-bit) Running under: macOS Big Sur 10.16

Matrix products: default BLAS:  
/Library/Frameworks/R.framework/Versions/4.0/Resources/lib/libRblas.dylib LAPACK:

```
1260 /Library/Frameworks/R.framework/Versions/4.0/Resources/lib/libRlapack.dylib
1261 locale: [1]
1262 en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
1263 attached base packages: [1] stats graphics grDevices utils datasets methods base
1264 other attached packages: [1] car_3.0-10 carData_3.0-4 scales_1.1.1
1265 [4] cowplot_1.1.0 lmerTest_3.1-3 lme4_1.1-26
1266 [7] Matrix_1.3-2 GPArotation_2014.11-1 psych_2.0.9
1267 [10] forcats_0.5.0 stringr_1.4.0 dplyr_1.0.2
1268 [13] purrr_0.3.4 readr_1.4.0 tidyr_1.1.2
1269 [16] tibble_3.1.2 ggplot2_3.3.4 tidyverse_1.3.0
1270 [19] citr_0.3.2 papaja_0.1.0.9997 tinylabels_0.1.0
1271 loaded via a namespace (and not attached): [1] nlme_3.1-152 fs_1.5.0
1272 lubridate_1.7.9.2
1273 [4] httr_1.4.2 numDeriv_2016.8-1.1 tools_4.0.4
1274 [7] backports_1.2.1 utf8_1.2.1 R6_2.5.0
1275 [10] DBI_1.1.0 colorspace_2.0-1 withr_2.4.2
1276 [13] tidyselect_1.1.0 mnormt_2.0.2 curl_4.3.1
1277 [16] compiler_4.0.4 cli_2.5.0 rvest_0.3.6
1278 [19] xml2_1.3.2 bookdown_0.21 digest_0.6.27
1279 [22] foreign_0.8-81 minqa_1.2.4 rmarkdown_2.5
1280 [25] rio_0.5.16 base64enc_0.1-3 pkgconfig_2.0.3
1281 [28] htmltools_0.5.0 dbplyr_1.4.4 fastmap_1.0.1
1282 [31] rlang_0.4.11 readxl_1.3.1 rstudioapi_0.13
1283 [34] shiny_1.5.0 generics_0.1.0 jsonlite_1.7.2
1284 [37] zip_2.1.1 magrittr_2.0.1 Rcpp_1.0.6
1285 [40] munsell_0.5.0 fansi_0.5.0 abind_1.4-5
```



- 1286 [43] lifecycle\_1.0.0 stringi\_1.5.3 yaml\_2.2.1
- 1287 [46] MASS\_7.3-53 grid\_4.0.4 blob\_1.2.1
- 1288 [49] parallel\_4.0.4 promises\_1.1.1 crayon\_1.4.1
- 1289 [52] miniUI\_0.1.1.1 lattice\_0.20-41 haven\_2.3.1
- 1290 [55] splines\_4.0.4 hms\_0.5.3 tmvnsim\_1.0-2
- 1291 [58] knitr\_1.30 pillar\_1.6.1 boot\_1.3-26
- 1292 [61] reprex\_0.3.0 glue\_1.4.2 evaluate\_0.14
- 1293 [64] data.table\_1.13.2 modelr\_0.1.8 vctrs\_0.3.8
- 1294 [67] nloptr\_1.2.2.2 httpuv\_1.5.4 cellranger\_1.1.0
- 1295 [70] gtable\_0.3.0 assertthat\_0.2.1 openxlsx\_4.2.3
- 1296 [73] xfun\_0.19 mime\_0.9 xtable\_1.8-4
- 1297 [76] broom\_0.7.6 later\_1.1.0.1 statmod\_1.4.35
- 1298 [79] ellipsis\_0.3.2

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