Union dissolution after live and non-live births

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Abstract

A long-standing debate has assessed whether having children stabilizes unions once selection into parenthood is considered. Moreover, previous studies have generally failed to distinguish couples that are unintendedly childless. To overcome this limitation, we use information on pregnancy loss. We use data of British and German couples who either transitioned to parenthood or experienced a non-live birth and remained childless or had a live-birth after a pregnancy loss. Using event history analysis, we assess if differences in partnership stability emerge between couples who had a child, once accounting for selection by sociodemographic, partnership and mental health characteristics. The results would suggest if the persistently increased risk of separation among couples who remained childless is likely to be driven by their unintended childlessness.

The loss of a pregnancy is a traumatic event for any family. Despite low rates of fetal and perinatal mortality in high-income countries with modern healthcare systems, pregnancy losses affect one in five or six pregnancies. A pregnancy (or fetal) loss is a collective term used to identify a pregnancy that does not result in a live birth (Quenby et al. 2021; Flenady et al. 2016) and might occur any time during the gestation, including the delivery. According to National Health Service (NHS) in the UK, it is termed "miscarriage" when it occurs before the 24th week of pregnancy, and "stillbirth" thereafter (Quenby et al. 2021). In high-income countries, 11 to 21% of clinically detected pregnancies result in miscarriage (Bruckner and Catalano 2018), while approximately 0.4-0.5 percent of pregnancy loss occur as stillbirths (ONS 2020).

The experience of pregnancy loss can be physically and emotionally draining. The literature on fertility and well-being has shown that parenthood generally has a positive effect on partners' well-being, which is also considered a key determinant of partnership stability (Ferreira et al. 2016; Kjaer et al. 2014; Pelikh et al. 2023). Most studies have shown that parents' well-being, happiness and life satisfaction increase in the years around the birth and return to previous baseline levels or even fall below pre-pregnancy levels (Clark and Georgellis 2013; Myrskylä and Margolis 2014; Tosi and Goisis 2021). Nevertheless, the constant rise of age at childbearing has increased the risk of involuntarily interrupted pregnancies, one of the known factors besides genetic anomalies (Dimitriadis et al. 2020). Little is known about the effect that a lost pregnancy has on the well-being and partnership stability of couples.

The present study addresses the question of whether pregnancy loss impacts couples' subsequent likelihood of partnership breakdown by analyzing partnership stability in childless couples who reported their first pregnancy. Drawing on findings from psychological research on grief and bereavement, as well as sociological research on the determinants of union dissolution, we employ event-history analysis to offer robust answers to this question. In addition to establishing whether post-loss bereavement affects union dissolution, this analysis examines the context in which the pregnancy loss occurs (before or after the transition to parenthood, or whether it remains standalone), the length of gestation, and the cumulative number of episodes. Furthermore, it investigates whether partners' grief trajectories and partnership satisfaction are relevant mediators.

Past studies have found that a fetal loss can impact partnership survival (Gold et al., 2010; Shreffler et al., 2012). However, these studies analyzed small cross-section samples or retrospective information provided by women only, with limited information on couples' previous or subsequent fertility and absent information on both partners' measures of subjective well-being around pregnancies. In other words, previous evidence does not offer the possibility to understand the couple-level mechanisms that make couples more prone to union dissolution after a pregnancy loss compared to those who transition to parenthood.

We contribute to the literature by proposing a novel way to identify couples who remain unintendedly childless and contribute to our understanding of whether experiencing a pregnancy loss has a destabilizing effect on union survival as opposed to becoming parents. This study improves upon existing research in several key aspects. First, it utilizes longitudinal data rather than cross-sectional data and incorporates information from

both partners, not just from women. Previous studies assessing the association between pregnancy outcomes and partnership survival have primarily relied on cross-sectional data, which only contain retrospective information on past pregnancies. By including couple-level data before and after a pregnancy, based on yearly updates, we enhance the evidence base. This longitudinal approach allows us to follow couples before pregnancy, soon after a loss, and years after a loss, helping to determine relationship processes and coping styles that may influence the risk of dissolution based on pregnancy outcomes.

Second, the data include precise timing of when the end of a coresidential union occurred for all couples in the sample, making it possible to determine the sequence of live and non-live birth (if any) and union dissolution. This allows to understand if a couple experienced pregnancy loss before or after a parenthood transition, or whether parenthood was never accomplished. This contrasts with previous studies, which could not definitively establish whether the loss happened before or after a live birth and the union dissolution.

Finally, we include information such as partnership satisfaction and partners' depression, a proxy of grief. This data allows us to trace and compare the partners' grieving processes, attempts to resolve conflicts or seek marital help, and couple communication or coping styles.

This study contributes to the debate on the "protective" effect of children on relationship (Chan and Halpin 2002; Kalmijn and Leopold 2021; Lillard and Waite 1993; Svarer and Verner 2008; Pelikh et al. 2023) by introducing a novel method to identify couples who remain unintendedly childless due to pregnancy loss. Couples with children are generally found to be less prone to union dissolution compared to childless couples (Kalmijn and Leopold 2021; Lillard and Waite 1993). However, some studies suggest that this "protective" effect might be due to selection into parenthood (Chan and Halpin, 2002; Steele et al. 2005; Svarer and Verner 2008).

The main limitation in conclusively assessing whether children stabilize unions is the difficulty in distinguishing between unintended and intended childlessness (Berrington 2017; Kreyenfeld and Konietzka 2017). Unintended childlessness, especially among couples with fertility intentions, could be associated with a higher risk of union dissolution (Ferreira et al. 2016; Kjaer et al. 2014). Therefore, comparing couples with children to childless couples overall could be potentially misleading. By comparing couples who become parents after a pregnancy leading to a live birth with couples who conceive but do not transition to parenthood, this study better evaluates whether the transition shapes partnership dynamics.

The data for this study are extracted from two longitudinal, population-representative surveys: Understanding Society in the UK and Pairfam in Germany. These surveys provide comprehensive data for both partners. Our sample includes childless couples in which women are aged 20-50 and who experienced a pregnancy for their first time during the observation period. Couples who had a child before entering the survey are excluded. We include women who conceived regardless of the outcome of the pregnancy (natural birth, caesarean birth, miscarriage, stillbirth).

Background

Parenthood and partnership survival

Having children is one of the primary reasons people form families as they are often seen as the bond that keeps partners together (Lyngstad, 2013). Children can be viewed as 'union-specific capital', investments that enhance partnership utility (Becker, 1991), or the successful outcome of a 'joint investment strategy' (Brines and Joyner, 1999), reducing couple uncertainty (Friedman et al., 1994). The affect theory of social exchange (Lawler, 2001; Lawler & Thye, 1999) suggests that commitment to social organizations, including families, arises from successful social interactions that produce positive emotions. When partners achieve significant milestones like the birth of a child, their commitment and positive emotions toward the relationship increase because shared children symbolize the partners' commitment to their relationship (Brines and Joyner, 1999).

Past studies have shown that couples with children are generally less likely to break up than childless couples (Andersson, 1997; Waite & Lillard, 1991; Leopold & Kalmijn, 2021). Additionally, parenthood can elevate relationship commitment, happiness, and life satisfaction, particularly during the transition to parenthood (Aassve et al., 2012; Kohler & Mencarini, 2016; Myrskylä & Margolis, 2014; Tosi & Goisis, 2021).

It remains unclear whether the lower propensity for dissolution among parents is due to the presence of children or other untested factors. Couples who decide to become parents are likely more stable and have a long-term outlook, whereas couples on the verge of dissolution are less likely to choose to have a(nother) child. Childbearing and partnership stability are endogenous processes, leading to the survival of relatively better-functioning couples among those with children (Lillard 1993). Therefore, the lower incidence of dissolution among parents could be because these families are generally more likely to be stable, not solely due to having children. Despite the endogeneity issue, the protective effect of children on union stability has been found—though less pronounced than in non-causal studies—even when this selectivity is accounted for (Lillard, 1993; Lillard & Waite, 1993; Steele et al. 2005; Svarer and Verner, 2006; Bellido et al. 2016). This indicates that couples with children have a lower breakup risk because they have stable relationships and actively choose to have children.

While childlessness is generally linked to higher risks of partnership dissolution, it is challenging to assert that childlessness itself causes separation. Distinguishing between couples who are involuntarily childless and those who choose not to have children requires information on both partners' fertility intentions and fecundity (Berrington, 2017; Kreyenfeld & Konietzka, 2017; Miettinen, 2010). This complexity is compounded by the variability of fertility intentions over time (Hayford, 2009; Iacovou & Tavares, 2011). Additionally, disagreements between partners on whether and when to have a child can negatively impact partnership stability and future childbearing (Shreffler et al., 2019; White & McQuillan, 2006).

The literature has yet to reach a definitive consensus on whether having children stabilizes partnerships and whether remaining childless destabilizes them (Pelikh et al. 2023). Two primary challenges include identifying couples who are involuntarily childless and disentangling the effects of parenthood and childlessness from the inherent characteristics of these groups, which are associated with varying risks of separation. Involuntary childlessness, which may be temporary or permanent, particularly in couples experiencing pregnancy loss, provides a unique context to test whether the absence of a transition to parenthood increases the risk of union dissolution.

The consequences of non-live births on couples

The death of a fetus or perinatal loss represents a joint loss that can reduce partnership survival chances. Partners' commitment might not manifest if a pregnancy is not carried to term (Brines and Joyner, 1999). The loss of a child can affect spouses psychologically, making their union more prone to breakup because the emotional bonds to the deceased child disappear, and both partners experience a loss they may not feel equally responsible for or affected by.

Limited research has investigated the impact of both miscarriage and stillbirth on couple relationship survival. Many studies focus on the risk of separation for parents who lost a child between birth and adulthood (e.g., Field and Behrman 2003; Rogers et al. 2008; van den Berg 2017), with some also exploring the link between a child's illness and the likelihood of union dissolution (e.g., Fallesen and Breen 2016). Among the studies addressing miscarriage or stillbirth, most suggest a higher risk of partnership dissolution. However, many of these analyses have used data from small, cross-sectional, clinic-based, or other nonrepresentative samples (Schwab 1998; Shreffler, Greil, & McQuillan, 2011).

Some studies suggest even positive associations between prenatal loss and partnership survival. For instance, clinic-based studies indicate that only 10-11% of couples who experienced a non-live birth considered divorce or separation (Cacciatore et al. 2008; DeFrain, et al. 1996), while 60% reported that their relationship was strengthened (DeFrain et al. 1996). However, these studies often exclude women or couples who do not seek treatment or therapy, rendering findings non-generalizable. Additionally, couples in therapy or qualitative studies may have inherently more resilient relationships (Shreffler et al. 2011).

Two studies used population-based data to assess the effects of miscarriage and stillbirth on relationship dissolution using US data (Gold et al. 2010; Shreffler et al., 2012). Both found that women who experienced pregnancy losses faced significantly greater hazards of relationship dissolution compared with women who had a live birth. They found that both types of loss are associated with an increased likelihood of separation for married and cohabiting couples (Gold et al. 2010) and ever-married women (Shreffler et al. 2012). Factors such as length of gestation, whether the pregnancy was planned, current childbearing desires, and a history of fertility problems are linked to a higher risk of union dissolution (Shreffler et al. 2012).

However, these studies did not account for whether pregnancy loss occurred before or after a live birth. Shreffler et al. (2012) faced data limitations that prevented them from considering the role of previous births, relying on samples of married women or those who had experienced a previous marriage, making the study selective. Gold et al. (2010) did not account for post-loss childbearing, which prevented analysis of whether parenthood eventually reduces the risk of union dissolution. Additionally, both studies focused only on women's characteristics, leaving it unclear how characteristics of both partners are associated with an increased risk of union dissolution following a loss.

We extend the previous literature in multiple ways. First, we incorporate the sequence of live and non-live births for nulliparous couples reporting at least one conception. By comparing the partnership stability of couples who conceived before or after at least one non-live birth to that of couples who transitioned to parenthood without experiencing pregnancy losses and to couples who remained childless after a pregnancy loss, we can better understand the role of involuntary childlessness on partnership stability. This approach allows us also to account for the effects of infertility stress and bereavement while isolating the impact of achieving parenthood. Second, we account for the time elapsed since the couple's first conception – whether it ended in a live or non-live birth – by exploiting the longitudinal nature of the data. We also consider for the characteristics of the gestation, such as its length and number of episodes of loss that couples may have faced after the first conception. Third, we explore characteristics of the couples that help elucidate the mechanisms that make partners more likely to break up. We draw from theories typically used to explain differential stress patterns between partners following miscarriage or stillbirth. In the following paragraphs, we detail the theoretical considerations and the knowledge gaps of each of the above-mentioned contributions of our study.

Pre and post-loss childbearing

A critical gap in the literature is the impact of sequence of live and non-live births on partnership survival. The transition to parenthood may affect partnership stability differently depending on whether it occurs before or after a pregnancy loss or if it does not happen at all. Involuntary childlessness determined by a miscarriage or stillbirth may be more detrimental if a couple never has children afterward. Previous research has not fully explored these various pathways into parenthood and their potential effects on partnership stability.

The literature analyzed post-loss childbearing and its consequences on partnership survival through the lens of fertility changes in response to child *post-natal* mortality (Nobles et al., 2015; Finnäs et al. 2018). Exposure to perinatal or neonatal mortality shapes fertility intentions (Finnäs et al. 2018) and realized fertility (Palloni & Rafalimanana, 1999; Hossain et al., 2007; Lindstrom & Kiros, 2007). This 'compensatory fertility behavior', or replacing the lost child with another one, may significantly influence the association between a child's death and parental dissolution, making it less clear-cut (Finnäs et al. 2018). Transitioning to parenthood after a child loss should not be interpreted causally. It may signal a turning point in the bereavement process, indicating that the couple has chosen to move forward (Johnson 1985; Mitchell et al. 1996), but it could also be an

unintended outcome (Lyngstad 2013). For example, a couple might conceive again not because they have fully overcome their grief but due to continued intimacy, resulting in a new pregnancy that eventually leads to a live birth. This scenario suggests that the couple remains together *despite* ongoing grief.

Evidence on the impact of childbearing post-pregnancy loss on partnership dissolution is limited. Gold et al. (2010) considered the presence of previous children but did not assess how a live birth post-pregnancy loss influences partnership survival. Shreffler et al. (2012) examined the role of parenthood transition after a pregnancy loss but could not track the existence of older children. Losing a child can impact the risk of parental separation and influence fertility behaviors, attempting to replace the lost fetus or striving to become parents. Since both union dissolution and fertility are influenced by the number of children a couple has, these associations are likely to be parity specific. The intention to have a child for a couple with no children may be higher than for a couple with at least one child (Finnäs et al. 2014).

Furthermore, losing a fetus may affect subsequent fertility intentions beyond child parity considerations. Unlike post-natal childbearing, losing a child during pregnancy may reveal fertility problems, making parenthood more challenging than expected. A miscarriage or stillbirth may expose issues of subfertility or infertility that need to be addressed before the couple can successfully have a child. Additionally, pregnancy loss might follow a difficult conception journey, such as through Medically Assisted Reproduction (MAR) and Assisted Reproductive Technology (ART) treatments, indicating the couple was already aware of subfertility or infertility issues (Köksal and Goisis, 2022). This context complicates the associations among bereavement, fertility intentions, and partnership stability.

To summarize, no study has jointly assessed the role of both live births before or after a pregnancy loss—beyond the effects of pregnancy loss and parenthood transition—on the risk of union dissolution. This article thus sheds light on the association between pregnancy loss and parental separation, specifically including the role of new births following or preceding non-live births. It contributes to filling the gap in existing research by jointly considering these various pathways and their implications for couples' partnership stability.

We distinguish between four scenarios to provide a more nuanced understanding of how involuntary childlessness affects relationship dynamics and stability: (a) couples who experience a live birth following a pregnancy loss, (b) couples whose pregnancy loss precedes the transition to a live birth, (c) couples who do not experience a live birth after a pregnancy loss, and (d) couples who report a live birth after their first conception. All these groups are previously childless and report a conception for the first time in the survey. The couples (a), (b) and (d) – unlike couples (c) – are able to have a child. Groups (a) and (c) are likely involuntarily childless, experience trauma, undergo emotional and physical stress and may be uncertain about their ability to conceive for some time after their first conception. Therefore, we expect that having a subsequent live birth following a loss is associated with lower odds of separation compared to not having a

live birth after the initial pregnancy loss (*Hyopothesis 1*), and that both cases involving a pregnancy loss before a live birth are more detrimental to partnership stability than having a non-live birth after transitioning to parenthood (*Hypothesis 2*). This also leads us to hypothesize that couples who have a child after a pregnancy loss have a lower separation risk than those who do not have a subsequent child (*Hypothesis 3*).

Time since first conception, gestation length and cumulative number of births

The risk of union dissolution may vary based on the outcome of couples' first pregnancy. Childbearing might explain the drop in separation risk at union formation, as the birth of a child is an indicator of factors like mutual affection and commitment that influence relationship stability (Jalovaara & Kulu, 2018). The risk of separation is notably reduced during pregnancy, remaining low immediately following the birth of the first child, and slightly increasing during the child's early years (Andersson, 1997; Hoem & Hoem, 1992). Thus, pregnancy may temporarily prevent the natural selection out of weaker relationships, keeping couples together who might otherwise have separated (Thomson & Holland, 2023).

However, the profile of the risk of union dissolution with respect to time from conception for couples who do not manage to have a child remains less understood. Literature suggests that the risk of dissolution for these couples is comparable to that of other groups during pregnancy (Andersson, 1997). Yet, this risk may increase post-pregnancy loss due to factors such as frustration and stress from the inability to conceive, rather than the child's age. This study aims to highlight whether the risk of union dissolution over time for couples experiencing a non-live birth follows a different trajectory compared to other couples, providing new insights into how pregnancy loss impacts short and long-term partnership stability.

The length of gestation and stage of pregnancy significantly influence parents' psychological and emotional responses. Earlier research generally found that attachment to the unborn child and grief reactions are greater following loss of further progressed pregnancies (Shreffler et al., 2011; Ryninks et al. 2022), although with some exceptions (e.g., Lovell 2011).

This heightened grief is likely due to the stronger attachment to the baby, and parents' planning about the child's future. Bowlby's attachment theory underscores the relevance of the emotional bonds formed during pregnancy, which tend to increase with milestones such as hearing the heartbeat or feeling the first kick (Bowlby, 1969). The abrupt severance of this attachment, coupled with physical consequences like bleeding and surgical operations, may exacerbate grief (Peppers and Knapp 1980; Shreffler et al., 2011).

Therefore, we expect that the longer the gestation period before a pregnancy loss, the greater the psychological impact on the couple, resulting in a higher risk of separation. Specifically, couples experiencing a loss later in the gestational period will have a higher risk of union dissolution compared to those experiencing an earlier loss, due to the deeper emotional and physical attachments formed over a longer period (*Hypothesis 4*).

Evidence on the psychological distress associated with recurrent pregnancy loss yields conflicting results. Some studies suggest that women who experience multiple losses often attach more significance to each subsequent loss (Swanson, 2000), leading to greater psychological distress (Adeyemi, 2008; Magee, 2003) and relationship strain (Janssen et al., 1997; Schwerdtfeger & Shreffler, 2009). This increased distress may be linked to higher odds of union dissolution (Turton, 2009), particularly among couples without prior children (Shreffler et al., 2012).

However, high levels of attachment to a perinatal loss can lead to unresolved grief and affect women's ability to attach to subsequent pregnancies (Robinson et al., 1999; Turco, 1981). Therefore, repeated losses may also become more normalized within the relationship, with the first loss posing the most severe challenge to the couple's unity.

It remains uncertain if the risk of partnership dissolution following a pregnancy or perinatal loss is influenced by the occurrence of multiple losses. Thus, we propose two competing hypotheses: the likelihood of union dissolution increases with multiple losses due to cumulative stress (*Hypothesis 5a*), and the likelihood of union dissolution does not increase with multiple losses as couples may become more resilient or desensitized over time (*Hypothesis 5b*).

Factors Mediating the Effect of Bereavement on Divorce Risk. "Divergent grief".

We explore whether and to what extent women's and men's well-being trajectories after pregnancy contribute to explain the risk of union dissolution. We hypothesize that differing psychological responses to pregnancy loss can erode intimate relationships, leading to misunderstandings, strain (McDonald et al., 2019), and eventually union dissolution.

Women and men show different well-being trajectories before and after a pregnancy, influenced by the pregnancy outcome. Mothers often show improved well-being around live births (Myrskyla & Margolis 2014; Tosi & Goisis 2021), while fathers' responses to parenthood are less consistent, with no clear patterns of change (Balbo and Arpino 2016; Di Nallo 2024).

Conversely, women experience a sharp, though short-term, decline in well-being indicators (e.g., increased depression, worse mental health, and happiness) following a pregnancy loss. They also experience more intense grief, with higher levels of distress, bereavement, and emotional upheaval, with about 25% meeting PTSD criteria after miscarriage (Wendolowska et al. 2022). Men's reactions to pregnancy loss are mixed, with some studies showing shorter grief phases and others indicating small although persistent depressive symptoms (Di Nallo, 2024).

Miscarriage or stillbirth can also heighten differences in grieving between mothers and fathers. Mothers generally form a deeper bond during the prenatal period, while fathers might not feel the pregnancy is "real"

until they take on a caretaker role post-birth (Peppers & Knapp 1980). “Incongruent grief” is the expression used in the bereavement literature to express differing grief responses between partners (Hiefner 2021). Grief is a complex interplay of emotional, physical, and psychological reactions influenced by individual experiences and cultural factors. Depression, a common response within grief, manifests both as a stage in the grieving process (Kübler-Ross, 1969) and as a persistent condition in complicated grief, potentially requiring professional intervention.

Divergent grieving styles may not only manifest in depression risk but also in communication and support-seeking behaviors. Social norms exacerbate stress as couples navigate divergent expectations about grieving (Hiefner 2021). On the one hand, pregnancy loss is often viewed as a "women's issue", leading women to seek open discussion. On the other hand, women face societal expectations to quickly overcome grief, which can lead to guilt and self-blame (Murphy and Cacciatore 2017). Men, however, tend to grieve privately (Marsiglio et al., 2013; Ogwulu et al., 2015), feeling unsupported and invisible (Hiefner 2021; Kranstuber Horstman et al. 2021). Discordant coping can result in communication conflicts, especially when mothers' visible grief contrasts with fathers' feelings of being misunderstood (McCreight 2004; Obst et al. 2020). Incongruent grieving reduces partners' ability to provide mutual support, increasing isolation and frustration (McDonald et al. 2022).

We hypothesize that increased partnership tension following the loss of a child, often related to gender differences in grieving patterns, may lead to higher risks of partnership dissolution. We advance an idea to test partners' incongruent grief by examining differences in partners' depression. While depression is only one dimension of the complex phenomenon of grief, we hypothesize that the greater the disparity in partners' depression levels—a proxy for diverging grief—the higher the risk of partnership dissolution (*Hypothesis 6*).

Data

This study draws upon data from two comprehensive and nationally representative panel surveys: the German Family Panel (Pairfam) and the UK Household Longitudinal Study (UKHLS).

Pairfam, launched in 2008, includes over 12,000 German residents from three birth cohorts (1971-1973, 1981-1983, and 1991-1993), with an additional East German sample (DemoDiff) and a cohort born between 2001-2003 introduced in later waves. The data were collected over 14 waves, with refresher samples added in Waves 11 and 14 to maintain representativeness. Pairfam provides longitudinal data on family dynamics, childbearing intentions, and perceived changes in fertility, making it well-suited for examining the impact of pregnancy and child loss on marital stability.

The extensive longitudinal nature of Pairfam, covering a period of 14 years for the same individuals and capturing data on childbearing intentions and perceived changes in fertility, uniquely positions it for investigating whether childbearing intentions evolve with within-person variations in perceived fertility.

UKHLS (Understanding Society, University of Essex 2023, https://www.understandingsociety.ac.uk) is a population-representative survey encompassing 40,000 households in the United Kingdom, spanning from 2009 to 2022. The dataset collects annual information on fertility, health, and family dynamics. The survey interviews all household members aged 16 or older, and includes details on reported pregnancies, such as the date of conception (month and year), gestational length (in months), reasons for interruptions, and delivery outcomes reported by women.

The analysis focuses on a subgroup of heterosexual couples without biological children (also referred to as "childless") with women aged 15-50 who experienced their first pregnancy during the observation period. This inclusion criterion is essential to ensure a reliable baseline value for examining the dynamics of partnership survival after pregnancy and facilitating comparisons among couples transitioning to parenthood and those experiencing pregnancy loss. Supplementary analyses have been conducted also to account for the maternal status (analyzing live and non-live births for childless women and mothers) and for women who experienced multiple instances of non-live births.

We excluded current pregnancies (where the birth outcome was still unknown), pregnancies that ended in voluntary terminations (as the decision might be influenced by the relationship's stability), and pregnancies that ended in the same month a relationship ended (since the data could not capture intervals of less than a month). For the remaining pregnancies, we identified outcomes as live births, miscarriages, or stillbirths. Miscarriages were defined as involuntary losses before 20 weeks of gestation, including ectopic pregnancies. Stillbirths were defined as involuntary losses at 20 weeks of gestation or later, but before birth. Infant deaths were not included because the timing of death was not specified, making it impossible to match these events to specific relationships.

Analytical strategy

We employ event history analysis to examine the risk of separation in couples experiencing various transitions related to parenthood: upon their first conception, after a pregnancy loss, before a pregnancy loss, or following a pregnancy loss without subsequently having a child by the end of the observation period. The analysis begins tracking couples at risk of separation from the time of conception, determined by the conception date reported in the questionnaire (UKHLS) or by the wave of conception (Pairfam). For couples who experienced a pregnancy loss, the timeline also starts from the date of the first conception. Separation, defined as the event of interest, is marked by at least one partner moving out of the shared residence. All observations are censored at the end of the last available wave, upon the death of either partner, or if the household drops out of the study, whichever occurs first.

Second, to account for differences in socio-demographic and partnership characteristics across groups, we present multivariate results from the piecewise constant event history analysis. We specify the piecewise constant exponential model as follows:

$$ln\mu i(t) = ln\gamma(t) + k\sum\alpha kxik$$

where $ln\mu i(t)$ denotes the hazard of partnership dissolution for couple, ttt refers to time since the first conception, γ(t)\gamma(t)γ(t) represents the baseline hazard, and xkx_kxk represents time-constant variables. Survival time is expressed either as a categorical variable (under two years, two to three years, four to five years, over five years) or as a continuous variable (linear and quadratic, depending on the model). These categories were defined based on the baseline hazard estimates produced for the annual periods.

To account for the selective profiles of the different groups, we adjusted the models for covariates that could confound the association between conception/pregnancy end and partnership stability. First, we controlled for the couple's socio-demographic characteristics: woman's age (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49) and birth cohort (five-year groups from 1960–1964 to 2000–2004).

To measure the couple's education, we used data on the highest qualification levels both partners had obtained by the start of the observation point, and distinguished between low (compulsory school education), medium (upper secondary and post-secondary non-tertiary education), and high (tertiary) levels. As the shares of men and women with low education were small (12% and 15%, respectively), we combined the low-educated and medium-educated classifications. The final variable has four categories: 'both partners have tertiary education', 'only the woman has tertiary education', 'only the man has tertiary education', and 'both partners have less than tertiary education'. More details on the educational variables are provided in the Supplementary Materials.

Second, we adjusted for partnership characteristics that previous studies have found to be associated with partnership stability (Berrington 2001; Guzzo 2014; Kulu 2014; Portman and Lyngstad 2007; Wu and Musick 2008, Pelikh et al. 2024). These characteristics include the age gap in a couple ('equal age or age difference within 2 years', 'the man is three or more years older', 'the woman is three years or more older'), the duration of the partnership (see above), the type of union (marriage or cohabitation), and the woman's partnership order (first, second, third-or-higher-order partnership). All the above-mentioned variables in the study are time-constant and measured at the time of conception.

Finally, we controlled for mental health, as previous studies have found that underlying mental health difficulties in a couple are negatively associated with partnership stability (e.g., Metsä-Simola et al. 2018). Studies have shown that a decrease in mental health prior to conception is associated with a higher risk of pregnancy loss (Di Nallo 2024), likely because pregnancy failures are more often preceded by MAR treatment, which is more frequently associated with the use of psychotropic medication (Goisis et al. 2023). To account for selection into pregnancy outcomes by pre-existing mental health characteristics that could confound the

association with partnership stability, we included measures of both partners' mental health up to 2 years prior to conception.

The Mental Component Summary (MCS) score, derived from the SF-12 health questionnaire, serves as a measure of mental health and one of the indicators of subjective well-being. The MCS score has been extensively validated and is used to identify mental health issues, including anxiety and depression (Ware et al. 1996). It comprises six questions related to mental well-being: (1) "During the last four weeks, how much of the time have you accomplished less than you would like as a result of any emotional problems, such as feeling depressed or anxious?" (2) "Did you work or perform other regular daily activities with less care than usual due to emotional problems, such as feeling depressed or anxious?" (3) "Have you felt calm and peaceful?" (4) "Did you have a lot of energy?" (5) "Have you felt downhearted and depressed?" (6) "Have your physical or emotional health issues interfered with your social activities, such as visiting friends or relatives?" The response options range from 1 ("all of the time") to 5 ("none of the time"). The MCS score is provided as a summated scale from lower to higher mental health levels (0-100). This scale is then standardized across the entire UKHLS sample, with a mean of 0 and a standard deviation of 1 (also see Tosi and Goisis 2021).

We controlled for an indicator of depression, GHQ (General Health Questionnaire), which has been validated and serves as a proxy for grief intensity. Previous studies have found that underlying subjective well-being is negatively associated with partnership stability (e.g., Metsä-Simola et al. 2018). Research also indicates that women who experienced a pregnancy loss are more at risk of exhibiting stress, anxiety, post-traumatic stress disorder, and other manifestations of grief compared to women who had a live birth (*quotation*). Additionally, we accounted for the difference in GHQ scores between partners to identify their "diverging grief," which some studies consider responsible for heightened conflict within the couple and, consequently, partnership dissolution (*quotation*). This latter indicator is displayed with its linear and quadratic terms.

In Model 1, we report the differences in separation risks among the groups, controlling only for the baseline period and age characteristics. Model 2 adjusts the results for education, while Model 3 incorporates partnership characteristics. Model 4 further adds women’s pre-conception mental health. To investigate whether the risks of separation differed between the groups over time, we estimated a model with period-specific effects (expressed as linear and quadratic time from conception), allowing the effects of the covariates to vary over time. These models included an interaction term with the baseline period for all covariates (Blossfeld et al. 2007). The results of this model are displayed in Figure 1.

Among the couples who experienced a pregnancy loss, we accounted for the length of gestation, defined as the time between the start of conception and the end of gestation. We distinguished between two categories: under three months and over three months of gestation. We also examined whether the cumulative number of pregnancy loss episodes experienced by couples is responsible for a heightened risk of union dissolution. In this case, we distinguished between one episode and two or more episodes reported.

To investigate whether the association between partnership stability was moderated by the length of the pre-loss gestation and the number of pregnancy loss episodes, we present the results of the analysis of Model 3, dividing the group "Pregnancy loss" into two subgroups. The results are shown in Figure 2 and detailed in the table in the appendix.

Results

We do not find substantial differences in the socio-demographic characteristics of the couples based on their pathways to parenthood and/or pregnancy loss (Table 1). Couples who experienced a non-live birth (pregnancy loss only) are, on average, older compared to couples who transitioned to parenthood. Among the couples who reported a pregnancy loss only, there is a higher proportion of men being older than their partners. These couples also reported a longer time together before conception, similar to couples who reported parenthood before pregnancy loss. No statistically significant differences emerged in the level of subjective well-being (depression), as proxied by the GHQ, among the four types of couples. Table A1 in the appendix shows the number of separations and person-months by categories of the main covariates.

Table 2 shows the hazard ratios of separation for couples who experienced a pregnancy loss (alone, before, or after a live birth) compared to couples who transitioned to parenthood. In the unadjusted models (Model 1 in Table 2), couples who faced a pregnancy loss and remained involuntarily childless had a significantly higher risk of separation than those who became parents upon the first conception (reference group). There were no statistical differences between the baseline group and couples who had a non-live birth before or after becoming parents. After controlling for socio-demographic and partnership characteristics (Model 2 in Table 2), the separation risks remained similar across couples. Further adjustment for pre-conception mental health (Model 3 in Table 2) resulted in negligible changes in coefficients, suggesting that the risk of union dissolution was not driven by prior mental health conditions.

Table 2. Risk of union dissolution. Odds ratios. United Kingdom.

	(1)	(3)	(5)	(7)
Couple type (*Ref*: Parenthood only)				
Parenthood after pregnancy loss	0.91	0.85	0.78	0.78
	(0.263)	(0.247)	(0.212)	(0.212)
Parenthood before pregnancy loss	0.56*	0.60*	0.63	0.63
	(0.173)	(0.185)	(0.180)	(0.179)
Pregnancy loss only	3.34***	3.58***	2.83***	2.82***
	(1.090)	(1.157)	(0.856)	(0.852)
Time after first conception				
0-2 years	0.78	0.76	0.76	0.77
	(0.134)	(0.131)	(0.128)	(0.128)
4-6 years	0.65**	0.64**	0.67*	0.67*
	(0.134)	(0.132)	(0.138)	(0.138)

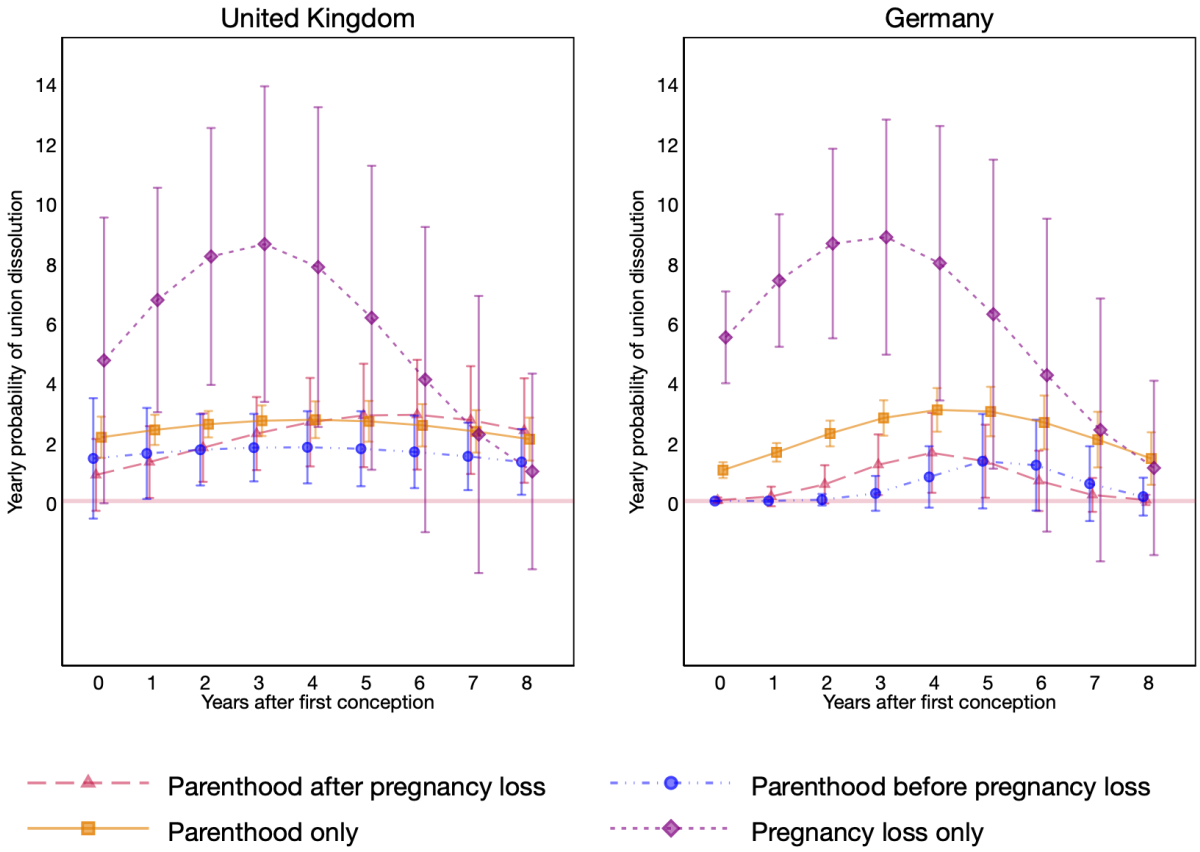
6+ years	0.77	0.75	0.89	0.89
	(0.145)	(0.141)	(0.179)	(0.180)
Woman's age at start of partnership (*Ref*: 20-24)				
< 20 years	1.78**	2.00**	1.50	1.50
	(0.480)	(0.564)	(0.388)	(0.390)
25-29	0.32***	0.42***	0.61**	0.61**
	(0.067)	(0.088)	(0.121)	(0.122)
30-34	0.16***	0.24***	0.40***	0.41***
	(0.038)	(0.058)	(0.096)	(0.098)
35-39	0.17***	0.24***	0.42***	0.43***
	(0.051)	(0.075)	(0.128)	(0.130)
40-44	0.13***	0.19***	0.31**	0.32**
	(0.074)	(0.105)	(0.168)	(0.172)
45+	0.09**	0.11*	0.15*	0.15*
	(0.102)	(0.128)	(0.166)	(0.172)
Age homogamy (*Ref:* -2/+2 years)				
Woman older (2+ years)	2.81***	2.73***	2.02***	2.01***
	(0.804)	(0.778)	(0.541)	(0.538)
Man older (2+ years)	1.68***	1.48**	1.39**	1.39**
	(0.280)	(0.246)	(0.217)	(0.218)
Woman's education (*Ref*: Degree)				
Other higher		1.09	0.86	0.86
		(0.335)	(0.253)	(0.253)
A level etc.		2.24***	1.69**	1.69**
		(0.553)	(0.400)	(0.399)
GCSE etc.		2.97***	2.13***	2.12***
		(0.788)	(0.539)	(0.538)
Other qualification		3.37**	2.48**	2.36*
		(1.665)	(1.124)	(1.085)
No qual./Not reported		0.98	0.93	0.94
		(0.529)	(0.475)	(0.481)
Education homogamy (*Ref:* Both tertiary)				
Only woman tertiary		1.07	0.93	0.93
		(0.278)	(0.232)	(0.232)
Only man tertiary		0.55**	0.67	0.67
		(0.165)	(0.191)	(0.191)
Marital status (*Ref:* Married)				
Cohabiting			2.20***	2.19***
			(0.384)	(0.382)
Union duration (*Ref*: 0-1 years)				
2-3 years			1.43*	1.43*
			(0.295)	(0.295)
4-5 years			0.98	0.98
			(0.225)	(0.224)

6-7 years			1.08	1.07
			(0.263)	(0.262)
8-9 years			1.10	1.10
			(0.297)	(0.295)
10-11 years			0.76	0.75
			(0.251)	(0.249)
12-13 years			0.50	0.49*
			(0.213)	(0.212)
14+ years			0.46**	0.45**
			(0.164)	(0.162)
Woman's union order (*Ref*: 1st union)				
2nd union			1.05	1.04
			(0.178)	(0.177)
3rd or higher union			1.76*	1.73*
			(0.575)	(0.567)
Union duration missing (*Ref*: No)			0.63	0.62
			(0.194)	(0.192)
Woman's mental health score 2 years before conception				0.99
				(0.008)
Man's mental health score 2 years before conception				0.75
				(0.277)
Constant	0.03***	0.02***	0.01***	0.02***
	(0.008)	(0.006)	(0.006)	(0.010)
Observations	13,219	13,219	13,219	13,219
Number of couples	2,269	2,269	2,269	2,269

*** p<0.01, ** p<0.05, * p<0.1

Among other covariates, the risk of union dissolution was highest between 3 and 4 years post-conception, diminishing before and after this period. The age of women at union formation followed a declining path, with higher risks of dissolution for those under 20 years and decreasing risks up to age 45+. Consistent with previous research, couples with heterogamic age profiles (women or men being older by more than 2 years) were more prone to dissolution than homogamic couples (age difference less than 2 years). Higher education levels, particularly where women held a degree or other higher education qualifications, were associated with lower dissolution risks compared to those with lower educational attainment (GCSE or other qualifications). Couples where men were the sole tertiary degree holders also showed a relatively lower risk of dissolution than other educational configurations, including couples where both partners were tertiary educated. Finally, the risk of dissolution decreased over time.

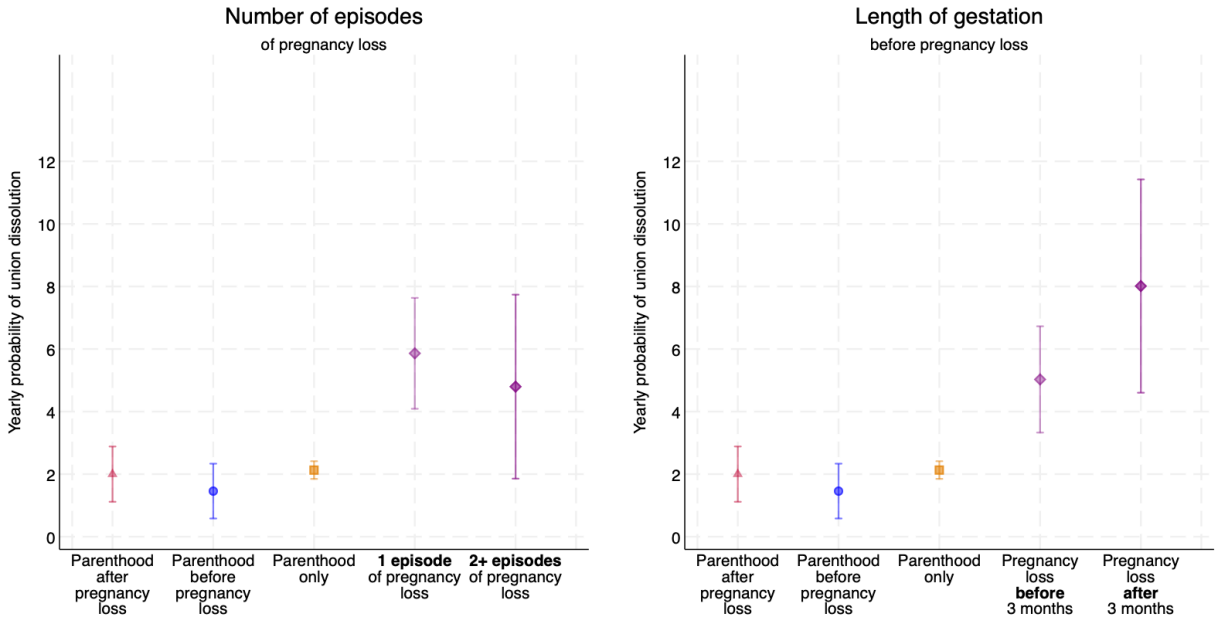
Figure 1. Yearly Probability of Union Dissolution Since First Conception Across Different Groups. United Kingdom and Germany.



We also studied how the separation risks varied across time among the different groups by estimating a model with period-specific effects. Figure 2 shows the fully adjusted estimates (with full results presented in Table A3 in the appendix). Among the "pregnancy loss only" group, the risk of separation gradually increases over time, peaking about 4 years after the first conception. In contrast, for all other couples, the risk of partnership dissolution remained approximately stable over time, averaging 2 percent per year in both countries.

Further, we investigated whether the changes in the separation risk for couples who had a pregnancy loss were moderated by the length of gestation (Figure 2, left panel) or by the cumulative number of pregnancy loss episodes (Figure 2, right panel). To do this, we replicated the analyses and split the "pregnancy loss" group into "pregnancy loss - gestation below 3 months" and "pregnancy loss - gestation above 3 months," as well as into "pregnancy loss - 1 episode" and "pregnancy loss - 2+ episodes."

Figure 2. Impact of Gestational Length and Number of Pregnancy Loss Episodes on Union Dissolution Risk



The results indicated that the risk of separation was higher among couples in the "pregnancy loss - gestation above 3 months" group compared to those in the "pregnancy loss - gestation below 3 months" group. However, this higher risk was not statistically significant due to the small sample size. When specifying the cumulative number of pregnancy loss episodes after the first conception, we did not find any significant differences, as the coefficients were almost equal.

We then studied how the interplay of parents' subjective well-being and the four groups affected the risk of dissolution. To measure subjective well-being, we used the GHQ score to assess depression. We analyzed the difference in GHQ scores between parents, where higher levels indicate that women are more depressed than men, lower negative levels indicate that men are more depressed than women, and a score of 0 indicates that men and women report similar levels of GHQ. We interacted these differences with the four groups mentioned above. Additionally, we included terms for the woman's GHQ level and indicators for missing GHQ scores for both women and men.

Figure 3. Yearly Probability of Union Dissolution Across Different Levels of Depression Discrepancy Between Partners

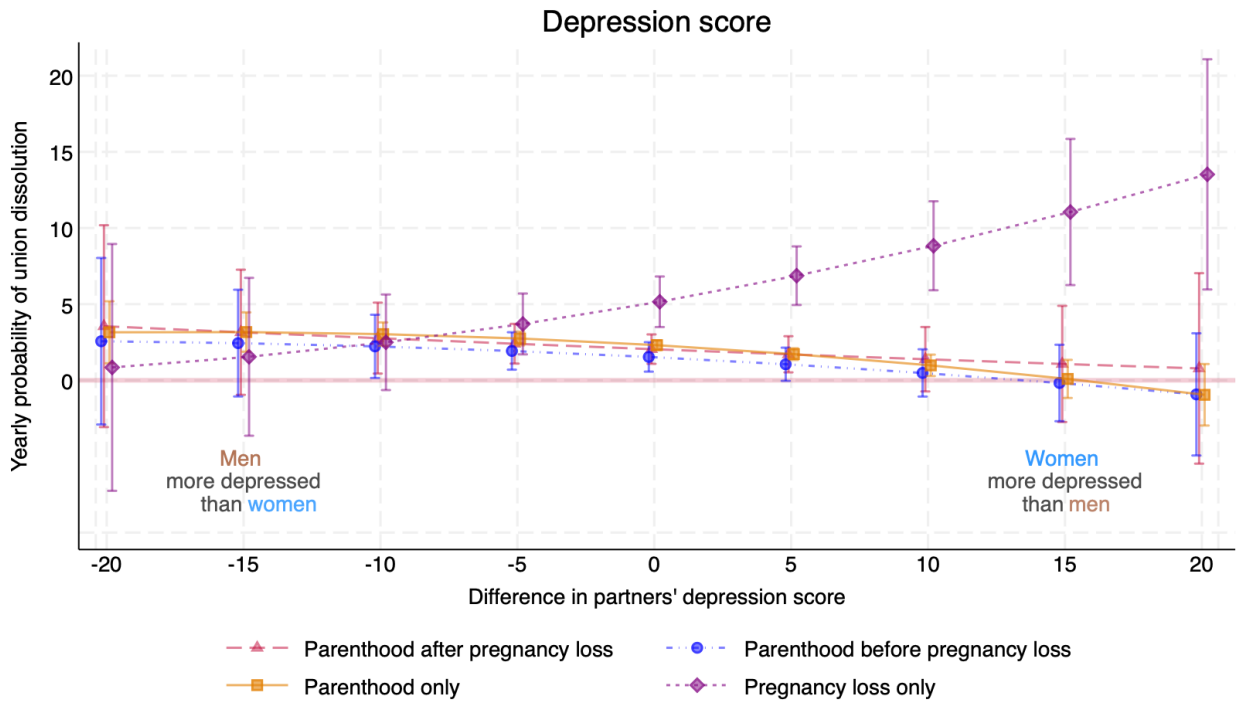


Figure 3 shows the risk of dissolution for each of the four groups of couples across different levels of GHQ differences between partners. On the right side of the graph, women are more depressed than men, while on the left, men are more depressed than women. For couples transitioning to parenthood, whether upon the first conception or after, the risk of union dissolution remains constant across different levels of GHQ differences. However, for couples experiencing a non-live birth and remaining childless, the risk of union dissolution increases as the GHQ differences rise, particularly when women are more depressed than their partners. Conversely, for lower levels of GHQ differences, where men are more depressed than women, the risk of union dissolution for these couples is similar to that of the other three groups. This suggests that the risk of partnership breakup is higher for couples who experienced a pregnancy loss and never became parents, particularly when women have worse GHQ scores than men. Table A.6 in the Appendix shows that the difference in partners' GHQ is statistically significant and positive only for the "pregnancy loss only" group ($p<0.05$). Additionally, the risk of union dissolution increases with higher levels of women's GHQ ($p<0.001$) and when women do not report any GHQ value.

Discussion

At least one in six pregnancies does not end in a live birth, posing significant emotional and psychological challenges for couples. The impact of involuntary pregnancy losses on partnership stability remains a crucial area of investigation, given the potential long-term effects on relationship dynamics. In this study, we contributed to the research on the influence of parenthood and involuntary childlessness on partnership

stability. In a sample of nulliparous couples, we identified involuntarily childless couples who experienced at least one non-live birth and compared their partnership stability to that of couples who transitioned to parenthood. By focusing on couples who transitioned to parenthood before or after a pregnancy loss, we were able to investigate how the experiences of a non-live birth are associated with partnership stability. Additionally, we examined whether these associations changed over time and were moderated by the characteristics of women and their partners in terms of subjective well-being and partnership satisfaction.

The analysis revealed these findings. First, the risk of union dissolution was significantly higher among couples who remained childless after experiencing pregnancy loss compared to those who had a live birth. Second, the risk of separation was notably higher among couples who experienced a pregnancy loss without subsequent parenthood than among those who experienced a pregnancy loss before or after parenthood. Third, the probability of breakup for couples with only a pregnancy loss peaked around three years post-pregnancy loss in both the UK and Germany, gradually decreasing over time to align with the levels of other couples approximately seven to eight years post-conception. Additionally, we found minimal differences in separation risks among couples who transitioned to parenthood, irrespective of experiencing a pregnancy loss, after accounting for socio-demographic, partnership, and mental health characteristics. Furthermore, the cumulative number of pregnancy loss episodes did not correlate with an increased risk of dissolution, while the length of gestation ending in loss appeared to have an impact, though the sample size limits definitive conclusions. Finally, partners' responses to a non-live birth partially explained the dissolution risk, as "divergent grief" (with women being more depressed than men) was linked to a higher risk of separation.

Our findings provide strong evidence that couples who remained involuntarily childless after pregnancy loss had a higher risk of separation not only compared to couples who transitioned to parenthood but also compared to couples who experienced a pregnancy loss before becoming parents. These results align with the only existing study, which found no substantial difference in separation risk between couples who faced pregnancy loss and those who had a live birth after a non-live birth (Shreffler et al. 2012). This study not only confirms that parental relationships are at a higher risk of dissolution after a miscarriage or stillbirth compared with those experiencing a live birth but also shows that it is the pregnancy loss *alone*—and not a live birth following or followed by a pregnancy loss—that significantly reduces the chances of partnership survival.

We also found that having a previous live birth before a pregnancy loss (marked by the group "parenthood before pregnancy loss") was associated with a lower hazard for relationship dissolution compared to the group "pregnancy loss only" and was not statistically different from the group "parenthood only". This result aligns with previous research on the effect of children on relationship stability (e.g., Bellido et al. 2016; Kalmijn and Leopold 2021), which suggests that the presence of children generally improves or has a neutral effect on the stability of co-residential unions. However, this finding contradicts the evidence of Gold et al. (2010), who found that a previous live birth was associated with a greater risk of breakup.

A likely explanation for these findings is that couples who transitioned to parenthood quickly after a pregnancy loss managed to alleviate the stress associated with the trauma. Another possible, non-mutually exclusive, explanation is that couples who experienced a non-live birth were able to strengthen their bond and support each other through the difficult time (Najman 1993). This response has been noted in qualitative research, which found that between 20% and 60% of couples who experienced a pregnancy loss reported feeling closer afterward.

It is also noteworthy that we found a low risk of separation among couples who reported a non-live birth after a live birth. These couples were likely less burdened by the stigma of infertility, having already transitioned to parenthood. This suggests that the context in which a pregnancy loss occurs—whether before or after the transition to parenthood—plays a significant role in determining the subsequent stability of the partnership.

These findings align with research indicating that involuntary childlessness is negatively associated with partnership survival. In particular, our findings echo recent research showing that couples who remained childless after MAR had a much higher risk of union dissolution compared to couples who conceived, either naturally or through MAR (Pelikh et al. 2023). It is, therefore, possible that children represent the 'union-specific' capital (Becker 1991) that stabilizes a partnership. However, the couple's ability to fulfill or adjust their fertility desires together and navigate the trauma of a pregnancy loss before parenthood may also be relevant.

Moreover, it is important to recognize that couples who break up before becoming parents after experiencing a conception not only lack a bonding ‘union-specific capital’ but also endure a grieving episode that likely impacts their mental and physical health for the years to come (Di Nallo 2024). While this analysis does not deny the role of children in cementing a partnership, it highlights an opposite force: the bereavement of a fetal loss. This loss can be as strong as, or even stronger than, the "cement" of a common child, potentially driving a wedge between partners and contributing to the higher risk of separation.

Our additional analysis of union dissolution risk by the time elapsed since the first conception revealed that couples' risk of separation was the highest within three years from the first pregnancy. This result suggests that the initial stress associated with the exposure to loss and the lack of immediate success can significantly impact a couple’s well-being and relationship quality, leading to separation (Gameiro et al. 2012; Olivius et al. 2004; Walschaerts et al. 2013). However, this association could also be influenced by the couple’s level of commitment and fertility desires. Consistent with the claim that having children reduces uncertainty and enhances partnership stability (Friedman 1994), it is possible that less committed couples were more likely to separate shortly after the loss, whereas highly committed couples were more likely to continue trying to conceive and to stay together. At the same time, while couples with strong fertility intentions and great mutual commitment might have been more persistent in their efforts to achieve parenthood, they may have found it harder to adjust to involuntary childlessness, potentially increasing their risk of separation over the long term. Previous studies have shown that pregnancy losses can have long-lasting negative consequences on couples’

mental health, sexual life, and relationship satisfaction (Bagade et al. 2022; Goisis et al. 2023; Klemetti et al. 2010; Lechner et al. 2007; Verhaak et al. 2007; Wirtberg et al. 2007), which could contribute to an increased risk of separation over time.

The set of models with cumulative controls that analyzed partnership stability after the first conception showed that the separation rates of couples who either transitioned to parenthood without experiencing pregnancy loss or had children before or after an episode of non-live birth were lower than those of couples who experienced a pregnancy loss without having a child. While this could reflect higher commitment levels among couples who had a baby despite a non-live birth, it is also possible that the increase in life satisfaction and happiness associated with the transition to parenthood had a strong protective effect against the stress related to infertility or subfertility signaled by the non-live birth.

These differences persisted almost entirely once we accounted for the advantaged socio-demographic and partnership characteristics. This result is not entirely surprising, as the experience of a pregnancy loss is a pivotal event in a couple's life and is generally exogenous to most confounders. However, the risk of pregnancy loss has been positively associated with women's age and correlated with some socio-economic factors. On one hand, women of lower socio-economic status are more exposed to this risk, possibly due to unhealthy lifestyle factors. On the other hand, pregnancy loss is correlated with MAR treatments, which are highly selective of high-SES couples, who tend to be less prone to dissolution (Pelikh et al. 2023).

Previous research has shown that couples who conceived through MAR were likely to overcome the mental health and well-being consequences of infertility- and MAR-related stress after the transition to parenthood (Goisis et al., 2023; Tosi and Goisis 2021; Verhaak et al. 2007). Overall, this finding represents an important contribution to the discussion about the differences between couples who conceived after a non-live birth and couples who had children without experiencing pregnancy losses. It highlights that while subfertility-related stress might be associated with a decrease in a couple’s well-being and mental health (Klemetti et al., 2010; King 2003; Luk and Loke 2015; Milazzo et al. 2016; Verhaak et al. 2007), the separation rates of couples with children were similar regardless of whether they had prior experiences of subfertility and pregnancy loss.

In light of the findings in the psychologically oriented literature on bereavement, it is evident that fetal loss is a traumatic and stressful experience for parents, with long-lasting impacts. Previous research has struggled to confidently establish the effect of bereavement on the risk of separation and identify the potential mediators of partners' psychological conditions due to data limitations.

The analysis reported here, the largest study of pregnancy loss and union dissolution to date, reveals a pattern of higher union dissolution among bereaved parents who never transition to parenthood compared to those who experience parenthood, regardless of whether they also experience a non-live birth. Specifically, having a child after a pregnancy loss significantly moderates the bereavement effect. The excess dissolution risk for bereaved couples increases over time until the third year after the first reported conception, after which it aligns

with the separation risk of other couples. Although we cannot precisely quantify bereaved parents' excess risk of separation, it is evident that this group is almost three times more likely to dissolve their unions compared to couples who have a child and never experience a non-live birth. This conclusion aligns with other studies that highlighted this higher risk for women using retrospective data in the United States (Gold et al., 2010; Shreffler et al., 2012).

Couples who experienced pregnancy interruptions after the third month showed a higher risk of relationship dissolution compared to those with interruptions before the third month. However, the limited sample size prevented us from testing whether later-stage pregnancy losses are also associated with a more persistent risk of partnership dissolution. While parents often form attachments soon after conception, later losses provide a longer period for attachment, potentially leading to greater psychological trauma and prolonged stress (Ryninks et al. 2022). Unlike most miscarriages, later fetal losses often involve parents feeling the baby kick and hearing fetal heartbeats, which can heighten anticipation and make the loss more tangible (Shreffler et al. 2011).

Although a causal mechanism cannot be assumed solely based on the temporal relationship found in this observational study, there are plausible mechanisms by which miscarriage and stillbirths could increase relationship dissolution.

Fetal loss may be a significant source of additional stress in a relationship. While the majority of couples are able to adjust to a loss and may even grow closer, there may be a subgroup whose relationships are particularly vulnerable to this major stress. Couples with an unstable relationship before the pregnancy and those with other risk factors for breaking up may find themselves unable to sustain their relationship after a miscarriage or stillbirth. Additionally, having a live birth might be protective, rather than miscarriage increasing dissolution rates.

Our research reveals that couples displaying a greater distance between women and men's depression scores (with women being more depressed than men but not vice versa) are those more at risk of union dissolution. This finding may be interpreted as a confirmation of the "incongruent grief" hypothesis, which suggests that couples where women and men grieve differently are more prone to strain. This study indicates that heightened conflict induced by pregnancy loss may be responsible for the union breakup.

Our study has some limitations. First, while using survey data has many advantages, these data do not contain annual information on people’s fertility intentions. Thus, we could not distinguish between those who intended to get pregnant and those who did not, which might be associated with different risks of separation. Previous research has shown that having an unintended pregnancy might lead to increased levels of distress in parents (Barber and Steinberg, 2022; Beck, 2001; Maximova and Quesnel-Vallée, 2009) and to higher separation rates (Guzzo and Hayford, 2012, 2014; Stykes and Guzzo, 2020). Additionally, a pregnancy loss can alter women’s and partners' fertility intentions in both the short and long run. To gain more insight into the relative contribution of fertility intentions to partnership stability, future research should compare the partnership

stability of couples who conceived through MAR, couples who intended to become parents and conceived naturally, and couples whose pregnancy was unplanned.

The strengths of our study include the use of longitudinal, population-representative, and couple-level survey data from two European countries to compare the partnership stability of all nulliparous couples who underwent a pregnancy loss, including those who became parents and those who remained childless, with that of couples who had children without experiencing pregnancy losses. Though potentially affected by non-response, the yearly frequency of the interviews reduces recall bias issues associated with survey data. We employed all available information from women and their partners, linking this to the women's longitudinal partnership and fertility histories, as well as to couple-level socio-demographic and partnership characteristics, and measures associated with depression and partnership satisfaction.

To date, studies of partnership stability in couples who experienced an involuntary pregnancy interruption have been rare due to a lack of high-quality representative data and the challenges of linking these data with information on the longitudinal partnership trajectories of these couples. Only two previous studies have compared the partnership stability of women who had pregnancy losses to those who became mothers (Gold et al., 2010; Shreffler et al., 2012). A limitation of both studies is that while they included women who experienced at least one pregnancy loss, they did not distinguish between nulliparous couples and couples who already had children or couples who had children post-pregnancy loss. This prevented them from drawing conclusions regarding the association between involuntary childlessness before/after pregnancy loss and partnership stability. In contrast, our focus on couples, rather than just women, who were involuntarily childless after pregnancy loss allowed us to improve our understanding not only of whether experiencing a non-live birth constitutes a risk factor for relationship stability, but also of the partnership dynamics among involuntarily childless couples more broadly.

We were also able to outline the profile of the risk of dissolution over time after the first conception, enabling us to gain a better understanding of how couples adjust to involuntary childlessness.

Among the strengths of the data, longitudinal surveys are less prone to recall bias compared to retrospective surveys where episodes of pregnancy loss might be recalled from several years in the past. Additionally, the reliance on self-reported marital status, relationship outcomes, and pregnancy details reduces the likelihood of systematic bias among the four groups under analysis. While we observed a strong temporal association between greater relationship dissolution and fetal loss, the study design does not establish causation.

An additional advantage over previous similar studies is our ability to track union relationship quality and women's mental health prior to conception and at a younger parental age. Past studies have found that greater grief and mental distress are associated with reduced relationship satisfaction. Therefore, a plausible hypothesis to consider is whether characteristics that put a couple at risk for separation are also associated with a higher risk of miscarriage or stillbirth. However, we found no strong evidence that pre-existing mental illnesses, such

as depression and anxiety, are contemporaneously associated with both pregnancy loss and stress on the relationship. Although we controlled for such factors in the analysis as best we could, it is more plausible that mental illness and other characteristics (such as substance abuse, domestic violence, or chronic medical diseases, etc…) might pose a danger to the couple's relationship only after the involuntary pregnancy end.

Finally, we shed novel light on the potential mechanisms that explain the interplay between spouses leading to separation. We tested, for the first time, the hypothesis that "diverging grief" between partners not only leads to heightened strain post-pregnancy loss but also brings about a higher risk of union dissolution. Additionally, we examined whether a non-live birth casts a shadow on stability by precipitating spouses' mutual partnership satisfaction.

From a family stress and coping perspective, the involuntary end of pregnancy is a major stressor for families. Clinical workers may benefit from understanding this impact in their work with bereaved couples. A causal interpretation of the effect of bereavement depends on the assumption that the relationship is not completely confounded. While parental age is a factor, fetal death is likely an exogenous event that occurs randomly among childless couples. However, the transition to parenthood post-loss is likely influenced by unobserved characteristics and circumstances of the parents. The evidence does not contradict the "protective effect of children" hypothesis, which suggests that childbirth brings partners closer. This can be seen indirectly: couples who have a child post-pregnancy loss are significantly less likely to break up than those who never have a child post-loss. Additionally, couples who transition to parenthood without experiencing pregnancy loss are generally more stable than childless couples. However, the transition to parenthood post-pregnancy loss is linked to the ability to overcome bereavement, and the grief triggered by fetal loss may outweigh the protective effect of children in the case of a non-live birth, preventing us from drawing causal conclusions.

Given the general trend towards postponing parenthood, the increasing prevalence of couples facing infertility or subfertility due to rising conception ages, and the growing proportion of childless couples, it is crucial to study how infertility and involuntary childlessness impact partnership stability in both the short and long term. By examining partnership stability among couples who remained involuntarily childless after pregnancy losses or who became parents after experiencing a non-live birth, we contribute to the discussion on whether having children stabilizes unions.

Our study also enhances the understanding of partnership dynamics among couples who experience pregnancy losses, which has significant implications for the well-being of these individuals and their children, in case of parenthood transition. Our findings may inform policymakers in designing supportive policies to help partners manage grief and navigate this challenging period. Additionally, clinical family therapists and grief psychologists can use this knowledge to design intervention plans that include both partners in therapy programs, ensuring comprehensive support for couples dealing with pregnancy loss.

In most European countries, perinatal grief support often focuses primarily on women, potentially overlooking the profound effects on men. Studies indicate that both men and women experience significant psychological stress, but the lack of societal recognition for men's grief can worsen emotional disconnect and contribute to relationship strain (Allsop et al. 2024; Vance et al., 2002). Previous research has highlighted that women are more likely to receive therapy than their male partner. Both bereaved parents could benefit from psychological assistance following an involuntary pregnancy loss and further partnership counseling after the immediate crisis phase.

In conclusion, the traditional perception of pregnancy loss needs to encompass the experiences of both partners to foster a more supportive and understanding environment. Recognizing and addressing the disenfranchised grief of men, alongside the well-documented impacts on women, can improve the mental health outcomes and relationship dynamics post-loss. Bridging this gap in understanding and support not only aids individual healing but also strengthens the couple's ability to navigate future challenges together (Dyregrov et al., 2020; Kranstuber Horstman, 2021).