

Introduction

Numerous studies suggest that exposure to adverse events during early life can produce deleterious late life health (Almond & Currie, 2011; Barker, 1992; Ben-Shlomo & Kuh, 2002). More specifically, early life parental bereavement is a traumatic event that increases disease vulnerability throughout the life course in which multiple biological and social processes are involved (Marks, Jun, & Song, 2007). However, less attention has been given to mechanisms that can provide resilience against early life adversities such as parental bereavement. I bridge the theory of *compensatory advantage*, which posits that individuals from privileged backgrounds are less affected by adverse experiences (Bernardi, 2012), and apply it to health outcomes, shifting attention to the cushioning effect of social networks.

Bereavement during childhood can be a traumatic life event that elevates stress levels and increases vulnerability to disease and illness (Marks, Jun, & Song, 2007). At the same time, the death of a parent represents a loss of human and economic capital. This loss can help explain why bereaved children experience disadvantages in social outcomes, including decreased educational attainment (Case, Paxson & Ableidinger, 2004; Berg et al., 2014) and diminished labor market participation (Fronstin, Greenberg & Robins, 2001; Rosenbaum-Feldbrügge, 2019). Furthermore, the experience of becoming a widow can be traumatic, and this trauma itself can impact parenting behavior. The loss of a primary caregiver, especially at an early age, can thus have profound effects on an individual's health trajectory. Research has demonstrated that individuals who experience parental loss during childhood or adolescence may be at an elevated risk of premature death, both in historical populations (Sear & Mace 2008) and contemporary populations (Li. et al., 2014; Myrskylä et al., 2014). Adverse health outcomes resulting from parental death are observed throughout the course of life (Lindo, 2011; Maier & Lachman, 2000; Rostila & Saarela, 2011; Sear & Mace, 2008).

The existing literature on parental bereavement and its impact on health predominantly emphasizes negative outcomes, with limited exploration of potential protective factors that might mitigate or counteract these effects. We can draw inspiration from the literature on educational attainment. Bernardi (2012; 2014) identifies a *compensatory advantage*, indicating that individuals from privileged social backgrounds are protected from the negative consequences of prior adverse experiences. Regarding parental separation, research by Bernardi & Radl (2014) and Biblarz & Raftery (1993) does not reveal any compensatory advantage related to socioeconomic status (SES) in educational outcomes. In the context of parental death, Prix & Erola (2017) discover evidence of a compensatory advantage, albeit limited to specific types of educational enrollment, while Kailaheimo-Lönnqvist & Erola (2020) do not identify any such effect. Only a single study examines childhood mortality following parental death and does not find evidence for parent (SES) differentials (Debiasi, Rosenbaum-Feldbrügge & Eriksson, 2021).

In the context of parental bereavement, particularly during early life and its impact on health trajectories, I argue that social networks and social ties play a crucial role in supporting the bereaved child. Conceptually, this aligns with the view of social capital as a collective resource available to be drawn upon in one's social network (Bourdieu, 1991; Coleman, 1988) or social capital emanating from the community which Putnam (2000)¹ termed *community social capital*. The *cushioning effect* effectively is embedded in the view of Szreter & Woolcock (2003) who emphasize the importance of supportive

¹ Putnam (2000) distinguishes between inward and outward social capital. The former refers to strengthening of close ties such as family and friends whereas the latter refers to networks that spans across social groups.

networks within the *social support* dimension of social capital². This concept extends to the notion of community resilience during disasters and emergencies, where community social capital can act as a supplement or substitute in the absence of governmental intervention (Aldrich & Meyer, 2014). The support dimension can be direct support to a bereaved child (and the widowed parent) in terms of economic and human capital. However, another mechanism is emotional support networks that helps with stress-coping which could alleviate the impact of early-life stressors (Thoits, 2011). The bereaved child can receive support directly and indirectly. Social capital is linked to health outcomes through a social support mechanism.

A prominent example of the social support dimension is within religious organizations, and religious participation has been linked to higher life expectancy (Hummer et al., 1999). Some scholars argue that *religious social capital* is distinct (Maselko, Hughes & Cheney, 2011) while others, like Wuthnow (2002) view religious participation and organization as a component of social capital. I conceptualize it as the latter; if religious organization accounts for the majority of social capital, then religious social capital proxies community social capital. There are three obvious pathways through which religious social capital feeds into the social support thesis. First, active participation in these religious activities increases the likelihood of individuals becoming integrated into the wider community – embeddedness (Granovetter, 1973) – as well as participating in communal activities that are mutually shared among fellow members. Second, local religious congregations actively participate in providing social services and play a major role in servicing its members. Hence, the provision of informal social safety nets is an attraction for adherents and a source of social capital (Gnaan, Boddie & Yancey, 2003). Third, the church is an institution that fosters volunteering; first and foremost among its own members (Campbell & Yonish, 2003; Lim & MacGregor, 2012). To sum up, I claim that community social capital – proxied by religious concentration – can cushion deleterious health effects following parental death in early childhood thanks to active support mechanisms. This produces the baseline hypotheses:

H1: *Parental death during childhood decreases the probability of infant/childhood survival and adult longevity*

H2: *An increase in social capital will cushion the mortality penalty associated with parental death*

As the analysis of this study sets in the 19th century United States, it is necessary to briefly cover the historical aspect of social capital. Many aspects point toward that religious activities were an even greater source of social capital in the 19th century than in contemporary United States. First, the American Constitution decoupling of state and religion proved a breeding ground for religious competition which created a unique relation between the church and the adherent; churches could only gain membership by offering something valuable that were appealing to a specific group (Finke & Stark 1989). Putnam (2000, Ch. 4) demonstrates a connection between the national decrease in religious organization and activities and the decline in social capital from the middle of 20th century. Additionally, historical populations and developing countries often lacked public health care and social insurance programs, leaving families vulnerable to significant shocks, such as the death of a caregiving parent.

Data & Methods

To examine the cushioning effect of social ties following early-life parental bereavement, I utilize Familinx, a genealogical dataset sourced from Geni.com (Kaplanis et al., 2018). In this study, I construct

² Sreter & Woolcock (2003) identify the additional dimensions ‘inequality’ and ‘political economy’ with which they construct a unified theory of social capital. However, this discussion is out of the scope of this article as the focus is limited to social capital that can have early life health benefits.

a two-generation pedigree and limit the sample to individuals born or deceased in the United States. I include only individuals with precise information regarding birth dates, death dates, and geographic coordinates. To match county-level church concentration from historical censuses to individuals' birthplaces, I obtain data on the total number of churches and total church members from the 1850, 1860, 1870, 1890, 1916, 1926, 1936, and 1950 censuses. Values between censuses are interpolated linearly. The outcomes of interest include infant survival, childhood survival, and adult lifespan. The primary independent variables are maternal and paternal bereavement at ages 0-2, 2-5, and 5-13, with samples conditional on survival. Community social capital is operationalized as religious concentration, represented as a county-level variable. It is calculated as the ratio of churches per capita plus church members per capita, transformed into a scale ranging from 0 to 10.

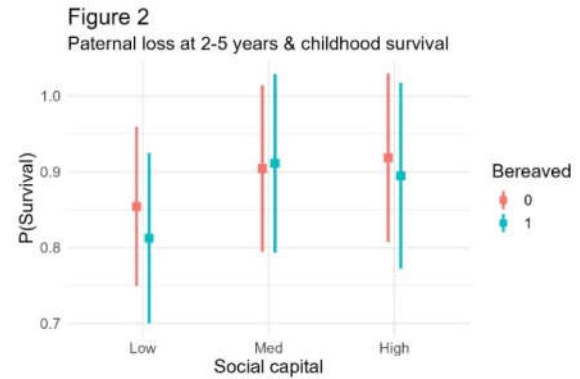
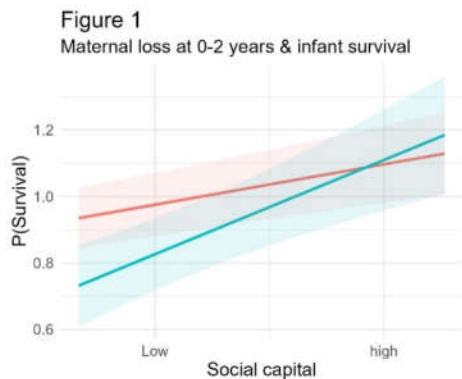
To estimate the independent effect of parental loss on survival and adult lifespan, I employ within-family models with fixed effects at the mother's level. This approach facilitates a comparison of parental bereavement between siblings, addressing potential biases in the data. However, it is acknowledged that this method may downwardly bias the estimates since bereaved children are compared to their older siblings who have also experienced bereavement. Additionally, state-fixed effects are included due to concerns that the distribution of community social capital may be correlated with unobserved state-level characteristics. The analysis utilizes OLS regressions to estimate linear probability models, with family and state fixed effects. Control variables encompass gender, internal migration, mother's lifespan, father's lifespan, and birth order. Results are reported as significant at $p < 0.05$ unless stated otherwise.

Results

The initial finding indicates that maternal loss has a significantly greater impact on infant survival, with a 13% reduction compared to a 3% reduction for paternal loss. Transitioning to childhood survival, which is conditional on surviving infancy, reveals a notable gradient for both maternal and paternal bereavement. Losing a mother between ages 2-5 decreases the probability of childhood survival by 2.6%, while the effect is 1.5% between ages 5-13. In the case of paternal loss, these figures are 1.3% and 0.5%, respectively, but they only reach statistical significance at $p < 0.10$. Adult lifespan, conditional on survival until age 15, does not exhibit any consistent or statistically significant results. However, when considering an alternative measure, longevity, defined as survival until age 70, only maternal loss during ages 0-2 produces significant results, predicting a 4% decrease in longevity. Overall, the results provide some support for *hypothesis 1*, although it is more pronounced for childhood survival. Additionally, there is a marked timing gradient in the impact of parental loss, with more substantial effects observed at earlier ages, consistent with findings in the literature on early life adversities.

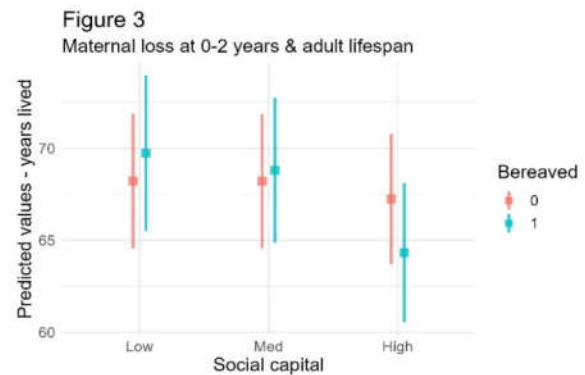
Turning to *hypothesis 2*, I investigate the cushioning effect of community social capital. Regarding infant survival, social capital supports the cushioning hypothesis, as depicted in *Figure 1*, showing that in communities with high levels of social capital, the adverse impact of maternal loss (ages 0-2) on infant survival diminishes. It's important to note that the social capital variable is log-transformed, with a range from 0 to 2.4. To illustrate, the probability of surviving infancy in a low social capital context (value = 0.5) is 15%, whereas in a high social capital context (value = 1.5), it decreases to 5%. For childhood survival, there is no significant interaction between social capital and maternal loss (at any age). When examining paternal loss, the only significant interaction is observed for losses occurring between ages 2-5 and childhood survival, as illustrated in *Figure 2*, using a binned variable (tertiles) of social capital. The effect size is substantive (4.7%), but statistical significance is only observed when comparing low levels of social capital to medium-high levels; there is no significant difference between

low and high social capital. Despite the coarse measure, these findings lend support to the cushioning hypothesis for infant and childhood survival.



Now, when examining the impact of parental bereavement during childhood on adult lifespan, the underlying mechanisms become less clear due to the complex influence of social capital throughout an individual's life course. Consequently, it's challenging to disentangle early-life social capital from adulthood and late-life social capital. As depicted in Figure 3, the interaction between maternal bereavement and social capital (measured at birth) contradicts the second hypothesis: high social capital amplifies the impact of parental bereavement. However, this apparent anomaly can be elucidated by considering the conditional sample—those who survived parental loss. Within this group, individuals who both endured maternal bereavement and survived in high social contexts may represent the less resilient individuals who managed to survive the early-life adversity of maternal bereavement, but the lasting effect was imprinted. Alternatively, it's plausible that certain secondary characteristics of high social capital communities, not accounted for in the analysis, play a role in this phenomenon

In summary, the study provides support for the first hypothesis, indicating that the impact of maternal loss is more significant than paternal loss. Additionally, there is a distinct timing gradient observed for both maternal and paternal bereavement concerning childhood survival. However, for adulthood variables, there is limited evidence of the impact of maternal loss. Regarding the second hypothesis, there is clear evidence of a cushioning effect of social capital for maternal bereavement and infant survival. Furthermore, a substantive effect is observed for paternal bereavement occurring at ages 2-5 and childhood survival.



Next steps

To begin with, the next step is to disaggregate the religious social capital variable into larger branches such as Catholicism and Protestantism as previous research show a positive relation on social capital with the latter and negative relation with the former. The second step will be to go into other measures of social capital. For this, I will draw on the literature on immigration which show that ethnic fragmentation decreases social capital (Alesina & Ferrara, 2000) while an opposing perspective covers the idea that ethnic enclaves are economically beneficial for co-ethnic residents (Portes & Wilson, 2002). For the latter, I will match individuals' ethnic origin with the share of local co-residents whereas for the latter social capital measure, an ethnic fractionalization index will be created. In addition, ecological variables such as urban population and economic output will be introduced.

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