

# Formative Experiences and Welfare State Expectations: A Cohort Analysis of Social Spending Preferences in Switzerland

Andrew Zola<sup>1,2,3</sup> 

<sup>1</sup>Chair of Macrosociology, University of Mannheim, Mannheim, Germany | <sup>2</sup>Center for Research on Social Inequalities, Sciences Po, Paris, France | <sup>3</sup>Laboratory for Interdisciplinary Evaluation of Public Policies, Sciences Po, Paris, France

**Correspondence:** Andrew Zola ([andrew.zola@uni-mannheim.de](mailto:andrew.zola@uni-mannheim.de))

**Received:** 17 January 2025 | **Revised:** 16 October 2025 | **Accepted:** 9 December 2025

**Keywords:** age-period-cohort analysis | new social risks | post-industrialism | socialisation | Switzerland | welfare attitudes

## ABSTRACT

Socioeconomic developments in high-income countries since the postwar era have induced fundamental changes in the predominant social risks to which people are exposed. This article seeks to determine whether this evolution is accompanied by changing expectations of the welfare state. It examines how family exposure to social risks as people come of age influences redistributive preferences later in life, and how aggregate shifts in social risk exposure across birth cohorts may correspond to intergenerational change in preferences. Age-period-cohort analyses using retrospective life-history and time series data reveal how support for spending on retirement, unemployment benefits, childcare, and social aid have developed across people born between 1918 and 1991 and participating in the Swiss Household Panel. Early-life exposure to social risks in the household is associated with high support for social spending, and individuals may durably support the welfare domains that best cover the type of risk their family experienced. An increase in new social risk exposure across birth cohorts is correlated with a weak intergenerational preference change. The study sheds light on how material conditions during the formative years may socialise individuals towards durable welfare attitudes, and opens a research agenda for studying welfare state expectations in the long run.

## 1 | Introduction

Socioeconomic developments among European populations since the 1970s have had substantial consequences for social risks. Deindustrializing labor markets, the mass entry of women into work, and more heterogeneous family structures have exposed people to greater difficulty reconciling work and family life, increased care obligations, and poverty due to incomplete social security coverage or obsolete skills (Armingeon and Bonoli 2007; Bonoli 2005, 2007; Daly and Lewis 2000; Huber and Stephens 2007; Orloff 1993; Taylor-Gooby 2004). Has growing exposure to these 'new social risks' influenced expectations of the welfare state?

Researchers have taken an interest in understanding how the distribution of resources (Brooks and Manza 2007; Iversen and Soskice 2001; Meltzer and Richard 1981) and experience with risks (Rehm 2009; Rehm et al. 2012) can influence support for redistribution. Longitudinal studies of within individual risk change and welfare attitudes tend to span no more than a few years (e.g., Margalit 2013; Naumann et al. 2016; Zola et al. 2025), which may not sufficiently capture the influence of gradual trends in risk exposure, such as the rise of new social risks (Bonoli 2005). An empirical investigation of long-run social risk change and the consequences for redistributive preferences may shed light on how the welfare state's task of political legitimization has evolved (Offe 1984; see also Habermas 1975).

This is an open access article under the terms of the [Creative Commons Attribution](#) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2026 The Author(s). *Social Policy & Administration* published by John Wiley & Sons Ltd.

This study proceeds in two steps. First, it considers whether individuals' welfare state expectations reflect prior socialisation experiences. Political values research has long shown that the material conditions in which one grows up contribute to durable political opinions (e.g., Inglehart 1977, 1990), with the family regarded as 'foremost among agencies of socialization into politics' (Hyman 1959, 69). Scholars of welfare attitudes, by contrast, have tended to emphasise institutional socialisation, focusing on how direct interactions with policies set normative expectations of redistribution (e.g., Mau 2003; Rothstein 1998; Svallfors 1997). This study primarily aligns with the family-centred perspective and integrates both approaches by examining how early-life household conditions and national policy contexts may leave a durable imprint on welfare attitudes. This allows it to extend previous studies in welfare attitudes research by linking preferences to life-course socialisation, bridging social policy and political values literatures.

The study then examines aggregate shifts in the quantity and type of social risk exposure across birth cohorts to determine whether this may influence an intergenerational change in attitudes. This step is rooted in long-run evolutions in predominant social risk exposure (Bonoli 2005, 2007; Taylor-Gooby 2004), and the fact that people who grew up and have spent their working lives in the postindustrial era may be more exposed to new social risks than their parents and grandparents. If this is the case, there may be important consequences for popular expectations of the welfare state as newer cohorts come of age and replace older ones.

I investigate preferences for spending in different welfare domains with age-period-cohort (APC) analyses that use retrospective life-history and time series data to measure family and institutional socialisation during individuals' formative years. This solves the identification problem associated with the collinearity of the three temporal terms and permits disentangling, within individuals, the influence of the concurrent social context from past, formative experiences on attitudes. I examine adults who came of age before and after the post-industrial transition and the rise of new social risks by using the Swiss Household Panel to study respondents who were born between 1918 and 1991. Switzerland provides an advantageous context for investigating the role of socioeconomic change on attitudes across cohorts because political institutions are strongly path dependent, resulting in late social policy adaptation to changing risks (Armingeon 2001; see also Ebbinghaus 2009). The low capacity of conservative welfare states to cover new social risks has led to the rise of 'outsider generations' (Chauvel and Schröder 2014), perhaps raising the material and attitudinal consequences of exposure to new social risks.

The results show that early-life, family-level exposure to social risks is associated with high support for redistribution, and that individuals may durably support the welfare domains that best cover the risks to which they were exposed in the formative years. For example, people who grew up with a single parent or with two parents working are more favourable to greater state spending on childcare when they are surveyed later in life. The analyses provide some evidence of an

intergenerational shift towards support for higher childcare spending, although this is weak, perhaps because the rise in new social risk exposure across birth cohorts captured in the sample is modest and incomplete when compared to people born later into the 1990s. Overall, the results may carry important implications beyond the Swiss case by shedding light on how socioeconomic conditions act as a socialisation mechanism for welfare state expectations.

From here, I map out a conceptual framework for understanding long-run evolutions in formative conditions and the potential consequences for welfare state expectations before describing the data and methods used in the analyses. Afterwards, I present the results and conclude by discussing the implications of the study for research on social policy and welfare attitudes.

## 2 | Conceptual Framework

Foundational texts in comparative social policy theorise that the welfare state is shaped by the political interests and cleavages produced by the socioeconomic structure (Castles 2009 [1978]; Esping-Andersen 1985, 1990; Korpi 1980, 1983; Piven and Cloward 1971, 1977; Shalev 1983; Stephens 1979). This has fueled interest in understanding changes in socioeconomic structures and the consequences for welfare needs since the postwar era. One prominent interpretation has been the rise of 'new social risks' (Bonoli 2005, 2007; Taylor-Gooby 2004). Whereas 'old social risks' were associated with the male breadwinner being unable to earn sufficient income for his family in an industrial labour market, new social risks have arisen due to postindustrializing labour markets and changing family structures. They include difficulty reconciling work and family life, single parenthood, care obligations, and poverty due to insufficient social security coverage (Bonoli 2005; Huber and Stephens 2007).

There has also been a strong interest in studying how material interests influence support for different social policies at the individual level (e.g., Iversen and Soskice 2001; Meltzer and Richard 1981; Rehm 2009; Rehm et al. 2012; see also Busemeyer et al. 2009; Laenen 2018; Svallfors 2008). Nevertheless, determining how social risks may influence popular expectations of the welfare state from the postwar era until the post-industrial era remains an empirical question. Take support for childcare as a motivating example. The increasing prevalence of people who experience difficulty reconciling work and family life since the 1970s may lead to substantial growth in support for robust, public solutions for childcare. While studies of attitudinal responses to punctual crises have been put forward (e.g., Ferragina and Zola 2022; Margalit 2013; Naumann et al. 2016; Zola et al. 2025), little evidence for such a gradual, long-run shift exists, perhaps because of the challenges with tapping into preferences over the course of decades.

The study starts from the premise that people will support formal social protection when they feel that it covers their needs. It focuses on tracing how the predominant social risks to which people have been exposed since the postwar period may attenuate or exacerbate changes in support for different welfare spending domains. This may play out not just in the present, but may also be instilled during people's

past, formative experiences. Generational research in sociology (Inglehart 1977), political science (Mannheim 1959 [1928]; Ryder 1965), and social psychology (Krosnick and Alwin 1989) has convergently established that people form durable attitudes early in life, which are influenced by the social context in which their cohort comes of age (Grasso et al. 2019; Svallfors 2010). In other words, while individuals' preferences can change from one moment to the next, or over the life course as an age effect, socialisation experiences leave a separate, lasting impression on people during their formative years (Campbell 2016).

Research on welfare attitudes has examined the influence that institutional arrangements play in socialising preferences. For example, differences in the level of support for redistribution emerge across countries with different welfare state regime types (Svallfors 1997), perhaps due to individuals learning what to expect from the welfare state based on their direct experiences with social policies (Rothstein 1998). Welfare institutions may thereby convey redistributive norms, which shape the 'moral economy' of shared understandings of obligations, entitlement, and fairness (Mau 2003).

A few researchers have worked to understand how long-run changes in institutional arrangements and political discourse may condition shifts in popular expectations. For example, Neundorf and Soroka (2018) demonstrate that people who grew up after the expansion of the modern welfare state in postwar Britain tend to become more supportive of redistribution in moments of economic crisis than their parents and grandparents who were socialised without the expectation of robust social protection. Svallfors (2010) shows that there has been an intergenerational convergence in welfare preferences among East Germans towards stable preferences found in West Germany since reunification, likely due to institutional change. Additionally, Grasso et al. (2019) examine the role of the political environment on setting values and find that British generations born and raised since Margaret Thatcher's term as Prime Minister are more authoritarian and sceptical of the welfare state.

This article builds on these perspectives by highlighting that the material conditions experienced in the family as an individual grows up may be among the most important socialisation agents for durable political opinions (Hyman 1959). For example, Inglehart (1977, 1990) demonstrates that the level of material security in which individuals are raised helps determine the likelihood of developing post-materialist values. Aggregate evolutions in material conditions may be accompanied by intergenerational shifts, with the rise of post-materialist values driven by an increasing proportion of postwar cohorts growing up in materially secure circumstances.

I therefore begin by investigating within-individual socialisation, and then examine whether changes to predominant social risks across birth cohorts may influence an intergenerational shift in attitudes. To my knowledge, the role of household material conditions has not been explored as a factor that may contribute to welfare attitudes socialisation and intergenerational changes in redistributive preferences. Filling this gap may shed light on how demographic changes that have shaped social risks

may also influence expectations of the welfare state's role to protect against them.

## 2.1 | Post-Industrial Socioeconomic Change and the Rise of New Social Risks

After World War II, the male breadwinner family model predominated in most Western European countries. In this model, social risks for family members were primarily centred on the adult male's capacity to earn a living wage via the market. When his capacity was low—in old age, or in the exceptional circumstances of sickness, injury, or job loss—robust pension, incapacity, and unemployment benefits provided compensation for lost income. For some groups like widows, whose risks were not channelled through a male breadwinner, other direct allocations existed.

The most consequential socioeconomic changes since that time trace their origin to the political economy transition in the 1970s, when the postwar 'golden era of welfare capitalism' gave way to post-industrialism, marking the start of a process of gradual liberalisation (Streeck and Thelen 2005; Thelen 2014). Core changes included the mass entry of women into the labour force, family structures becoming more heterogeneous, and population ageing (Ferragina et al. 2022); the decline of low-skilled manual jobs; and the rise of short-term contracts, greater volatility, and competition in the labour market (Clasen and Clegg 2007).

These changes transformed family structures and work patterns, thus shifting predominant social risks. The mass entry of women into the labour force gave rise to dual-earner couples, who often experience difficulty reconciling work and family life (Daly and Lewis 2000; Lewis 1992). Among dual-earner couples, there may be an increased risk of job loss and poverty when two salaries are necessary for a family to maintain a decent standard of living, and when care solutions for dependent family members such as children are not readily available. Meanwhile, growing heterogeneity of family structures and population ageing contributed to an increased care burden for groups such as single parents and those with elderly relatives, again making reconciling work and family obligations difficult. The elderly may also face an increased risk of poverty with longer life expectancies and a longer part of the life course when work is not possible.

Labour markets witnessed the decline of manual work and the rise of employment casualization as the shrinking industrial sector gave way to the growing service sector. These developments contributed to a growth in unemployment and poverty risk especially among low-skilled, manual workers, and were particularly consequential in places where wages are primarily determined via market mechanisms like Switzerland (Bonoli 2007, 499).

The change in predominant risk profiles can be understood as the rise of 'new social risks' (Bonoli 2005, 2007; Taylor-Gooby 2004). While these new social risks affect a larger proportion of the population than the so-called 'old social risks' whose prevalence peaked after World War II, they also tend to cluster among certain sociodemographic groups, including young people and the elderly, women, and low-skilled workers (Armingeon

and Bonoli 2007; Bonoli 2005; Huber and Stephens 2007; Taylor-Gooby 2004). I contend that it may also be appropriate to view exposure to old and new social risks from a generational perspective. While cohorts born before and during World War II grew up and spent at least part of their working lives in the postwar era where old social risks were prevalent, their children and grandchildren have spent much of their lives in a context of new social risks. This suggests that there has been a shift in the risk exposure across generations that came of age in the latter half of the 20th century. Some evidence for this has been put forward, for example with the rise of employment volatility in newer cohorts' career trajectories (Lersch et al. 2020).

The postwar welfare state was able to guarantee a decent standard of living by decommodifying segments of the population that could not rely on the market for sufficient income. However, transfer-oriented policies designed in the postwar era often provide inadequate protection against new social risks for several reasons. Employment volatility may mean that income earned on the labour market cannot guarantee economic security, and contributory-based policies may exclude people in unstable employment due to high eligibility requirements. Additionally, care obligations have increased beyond the scope of current services offered by the welfare state, and individuals' needs have become more heterogeneous and therefore difficult to target effectively.

To cope with these changes, many welfare states have, to a greater or lesser extent, expanded active labour market policies and childcare as part of an employment-oriented model that is meant to provide a greater capacity to maintain economic self-sufficiency (Dingeldey 2007; Ferragina 2022; Jessop 1993). For example, family policy reforms have aimed to increase individual choice (Van Winkle 2020) as the male breadwinner model gave way to dual-earning couples, single parenthood and increasing care obligations (Daly 2011; Esping-Andersen 2009; Lewis 1992; Trappe et al. 2015). These employment-oriented policies may more effectively cover new social risks (Taylor-Gooby 2004).

Exposure to social risks is associated with greater support for redistribution, often for measures that most appropriately cover those risks (e.g., Rehm 2009; Rehm et al. 2012). This study applies this logic to determine whether social risk exposure among the family during the formative years may influence policy preferences later in life. This provides the basis for the first hypothesis:

**H1.** *Exposure to either old or new social risks in the household during the formative years will be associated with higher support for welfare spending at the time of surveying.*

Following this, I contend that the type of social risk to which individuals are exposed during the formative years may differentiate welfare spending support patterns based on the type of policy that best covers the type of social risk experienced. This leads to the second hypothesis:

**H2.** *Exposure to old social risks in the household during the formative years will be correlated with support for transfer-oriented policies at the time of surveying; exposure to new social risks in the household during the formative years will be correlated with support for employment-oriented policies at the time of surveying.*

Given that exposure to social risks may change across generations born and raised since postindustrialisation (e.g., Lersch et al. 2020), these hypotheses can be situated in an aggregate perspective to understand how evolving predominant risk exposure may be correlated with a long-run shift in policy preferences. This leads to the third hypothesis:

**H3.** *An increasing predominance of new social risks over birth cohorts will be associated with an intergenerational increase in spending support for employment-oriented policies.*

If such a shift occurs, generational replacement may provide popular legitimacy to welfare state adaptation in the postindustrial era, raising the political stakes of adopting new social risk policies.

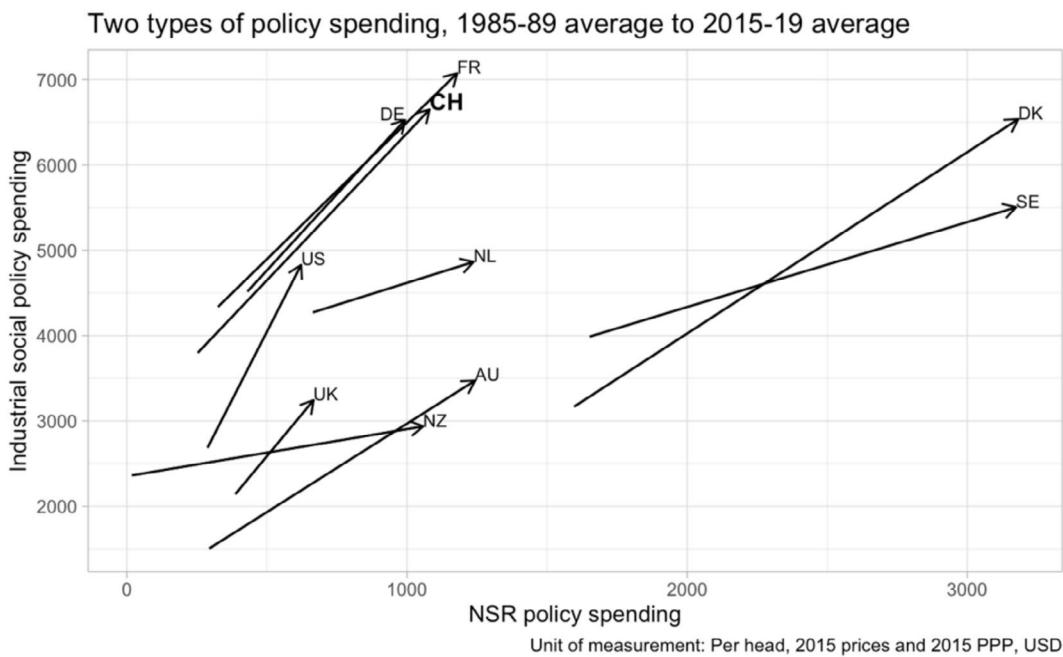
## 2.2 | Case Selection

Social policies adapt to cover changing social risks, meaning that it may be difficult to fully disentangle the role that family conditions play on setting people's welfare state expectations from institutional and political arrangements' influence. For example, if an individual develops high support for childcare in the formative years, this could be due to family experiences with difficulty reconciling work and family life, the presence and expectation of robust family policies from the state, or even political discourse promoting generous public childcare solutions.

This study focuses primarily on the role of family conditions because this may be the strongest socialisation agent for individuals' political opinions (Hyman 1959; Inglehart 1977), and in doing so, it also controls for the policy context during the formative years when data are available. In addition to this, it relies on the fact that the incremental and less extensive adaptation of the Swiss welfare state may amplify the material consequences of being exposed to new social risks.

Conservative welfare states have historically offered suitable entitlements to protect the male breadwinner and his family (Bleses and Seeleib-Kaiser 2004; Bonoli 2007), and have been characterised by incremental policy change since the post-industrial turn (Clegg 2007; Palier 2010). Switzerland is perhaps the clearest example of a latecomer in adopting policies that address new social risks in Western Europe (Armingeon 2001; Häusermann 2010). Social policy change in recent decades has tended to involve the federal consolidation of contributory, transfer-based policies geared towards insuring families that fit the male breadwinner model (Armingeon 2001). While there have been recent efforts to expand activation policies, government expenditure in these domains is often considered to be insufficient to meet demand. For example, as of 2024 access to public childcare is not universal, leading many families to rely on private and informal care. This makes Switzerland one of the most expensive countries in the world for childcare (OECD 2020).

The slow adaptation of the Swiss welfare state suggests that while it offered adequate protection against old social risks in the postwar era, this may be less the case for Swiss people exposed to new social risks. This may contribute to the rise of 'outsider generations' raised since the post-industrial turn in



**FIGURE 1** | Trajectories of spending on policies covering old social risks (y-axis) and new social risks (x-axis) across 10 countries and three decades.

conservative welfare regimes, whose social needs are insufficiently covered by current policies (Chauvel and Schröder 2014; see also Emmenegger et al. 2012; Rueda 2005, 2007).

To illustrate where Switzerland's coverage of risks stands in a comparative perspective, Figure 1 plots the trajectory of spending per capita on social policies that address old social risks (y-axis) and new social risks (x-axis) from the 1980s to the 2010s in 10 countries (OECD 2024a; Bonoli 2007). Social policies that address old risks are defined as cash benefits for old age and survivors (primarily pensions), all spending on incapacity, and cash benefits for unemployment. New social risk policies include services for old age and survivors (e.g., institutionalised care), family services (primarily early childhood education and care), active labour market policies, and social assistance (Huber and Stephens 2007). Although this division is imperfect, it gives general comparative insight into welfare adaptation strategies. All countries have increased their level of per capita spending since the late 1980s, with the Scandinavian countries leading the way in covering new social risks. Switzerland, meanwhile, aligns closely with other conservative welfare regimes in augmenting its spending efforts primarily on policies designed to cover old social risks.

### 3 | Data and Methods

The study relies on data from the Swiss Household Panel (SHP), an annual survey based on a random sample of private households that has been collecting data at the household and individual level since 1999. It is the only nationally representative panel survey that has collected preferences for spending in different welfare domains (in 2011, 2014, and 2017). I analyse a balanced panel of 5385 individuals across three waves, for 16,155 observations.<sup>1</sup>

The analyses proceed in two steps. To address the first and second hypotheses, I examine the extent to which family social

risks during respondents' formative years influence spending preferences when they are surveyed later in life. For the third hypothesis, I look for evidence that early-life family social risks have changed over the long run, and that this change is associated with a shift in spending preferences across successive cohorts.

### 3.1 | Variables of Interest

A battery of questions measures spending preferences: 'The government spends money in different sectors. Could you please tell me, for the following sectors, if you wish the government would spend more, less or the same amount?' The sectors analysed in this study include retirement, unemployment benefits, subsidisation of childcare, and social aid.<sup>2</sup> Possible responses are ordered 'more,' 'the same,' and 'less.' I assign the value -1 to a desire for less spending, 0 to the neutral response, and 1 to a desire for more spending.

Within individuals, past influences on current spending preferences may be numerous. The study takes the perspective put forward in the political socialisation literature that the family will be the most important factor (Hyman 1959). It uses retrospective life-history data gathered about the people with whom respondents lived at the age of 15, which is collected from all respondents either as part of their initial intake interview or during the first survey wave in which they are at least 20 years old, if they joined the panel before turning 20.

The information is used to construct an indicator of exposure to old social risks, new social risks, both, and neither at the household level during the formative years. The definitions of old and new social risks are derived primarily from Bonoli (2005) and Huber and Stephens (2007). Old social risk exposure revolves around instances of traditional family structures where at least

one adult is incapable of working to maintain a decent standard of living for the family, and of non-traditional family structures whose risk profiles are not directly related to postindustrial socioeconomic change such as widows. New social risk exposure deals primarily with households that may struggle to balance work and family life—for example, dual-earner couples with children, single parents—that experience unemployment or irregular employment in a service sector job, or that may have high care obligations.<sup>3</sup> While previous research does not explicitly understand old and new risk exposure as reliant upon household composition, many core concepts—for example, single parenthood, male breadwinner unemployment—suggest that these risks are primarily channelled through the household.<sup>4</sup> Table 1 breaks down how respondents are grouped.

These variables refer to only one point (15 years of age) during a span of several formative years that occur around early adulthood, but the simplification helps to determine at what moment in time respondents experienced their stated conditions, and the age of 15 is usually considered the reference for the formative years (Grasso 2014). Although recall inaccuracies are likely to occur in retrospective data, it is reliable for life-course research (Berney and Blane 1997; Dex 1995; Elder and Giele 2009).

In addition to family conditions, some analyses also control for labour force and policy factors at the national level when respondents were 15 years old because institutional arrangements may influence individuals' welfare preferences (e.g., Mau 2003; Rothstein 1998).<sup>5</sup> Namely, when modelling spending preferences for unemployment benefits and childcare,<sup>6</sup> certain analyses use as predictors the unemployment rate and the female labour force participation rate, as well as the national prevalence of spending on unemployment benefits and family policy when respondents were young. Data on the unemployment rate as a percentage of the labour force were gathered and assembled manually from ILO yearbooks (ILO 1946, 1955), while information on the female labour force participation rate as a percentage of the female population between 15 and 64 years old is available from the Comparative Family Policy Database (Gauthier 2011). Data on spending on unemployment benefits and family policy as percentages of GDP are gathered from the OECD's Social Expenditure Database (OECD 2024a).

I control for year of survey, as well as the indicator that captures respondents' concurrent household exposure to old social risks, new social risks, both, and neither (Table 1).<sup>7</sup> I also control for a linear and a quadratic effect for respondents' age in years, for sex (men, women), highest educational attainment,<sup>8</sup> and NUTS-3 geographical code.<sup>9</sup> Finally, I weight descriptive analyses with cross-sectional weights, as recommended by SHP guidelines (Antal and Rothenbuhler 2015).<sup>10</sup>

### 3.2 | Models

Modelling the linear effects of age, period, and cohort together is formally impossible (Mason and Fienberg 2012 [1985]; Mason et al. 1973), because they are perfectly collinear: once we know two of the terms, the third can be calculated. Nevertheless, all three temporal factors that will likely influence preferences. Researchers generally consider age to reflect self-interest

considerations across the life-course (Busemeyer et al. 2009). Period is usually taken as a proxy for the political and macroeconomic environment under which a survey wave is administered (Margalit 2013). Cohort represents the conditions in which individuals come of age that contribute to the development of durable political values.

Many solutions to the identification problem have been proposed, all of which involve 'breaking' the collinearity of the three terms (Fosse and Winship 2019; Grasso 2014). One of the simplest solutions is to suppress at least one term when there are strong justificatory grounds for believing that age, period, or cohort will not have a distinct correlation with the outcome variable. This is not likely to be the case when studying welfare spending preferences, which may develop over the life course, periods, and cohorts. Hence, I follow a technique pioneered by Farkas (1977) and Blossfeld (1986) that solves the identification problem by substituting one or more of the temporal terms with information that more directly captures the effect being studied. Rather than assuming that birth year can be used as a proxy for the circumstances under which individuals spend their formative years, I look for this information directly.

The first empirical step is to determine the extent to which early-life household conditions may influence spending preferences at the time of surveying, that is, once respondents have proceeded some way through the life course. The primary cohort substitute in this case is the respondent's risk profile at 15 years old. In certain model iterations, I also use national level time-series data on institutional arrangements about the unemployment and female labour force participation rate, as well as spending on unemployment benefits and family policies.

There is some variation in these measurements from 1 year to the next, and so I use the locally estimated scatterplot smoothing (LOESS) fit, a regression technique that provides estimates based on local subsets of the data to compile a smoothed curve across the range of birth years.

$$y_i = \beta_1(\text{risks@15})_i + \beta_x \mathbf{X}_i + \varepsilon_i$$

with  $\varepsilon_i \sim N(0, \sigma^2)$ .

The preferences  $y$  of each individual  $i$  are modelled as a function of risk exposure at the household level at 15 years old, as well as several control variables, including age and period, contained in the vector  $\mathbf{X}$  with their respective coefficients  $\beta$ , and respondent residual  $\varepsilon_i$ .

The second empirical step is to compare how attitudes develop across individuals born in different years to shed light on how long-run shifts in predominant social risks may influence evolutions in welfare state expectations. In this case, the primary cohort substitute is the prevalence of new social risks when individuals were 15 years old, measured as the weighted percent of respondents in each cohort living in new social risk households. The age-period-cohort models can be specified as:

$$y_i = \beta_1(\text{risk prevalence@15})_i + \beta_x \mathbf{X}_i + \varepsilon_i$$

with  $\varepsilon_i \sim N(0, \sigma^2)$ .

**TABLE 1** | Characteristics of respondents' household exposure to old and new social risks at 15 years old and at the time of surveying.

		15 Years old	Time of survey
Old social risk exposure	Sickness/disability or unemployment from a manual job	Living with father and mother; AND Father not in paid employment due to illness or disability; unemployment from a profession classified in ISCO08 groups <sup>a</sup> 6, 7, 8, 9, 0; retirement; or another reason	Living in a household with at least two adults in a relationship (married or unmarried) and $\geq 1$ child $< 18$ years old; AND One adult not in paid employment due (at least in part) to illness or disability; unemployment from a profession classified in ISCO08 groups <sup>a</sup> 6, 7, 8, 9, 0; retirement; or another reason
	Sickness/disability of the mother	Living with father and mother; AND Father in paid employment; AND Mother not in paid employment due to illness or disability, retirement, or another reason	Living in a household with at least two adults in a relationship (married or unmarried) and $\geq 1$ child $< 18$ years old; AND Female adult not in paid employment due (at least in part) to illness or disability; retirement; or another reason
	Widowhood	Living with either father or mother because the other parent is deceased	Ego is widowed
	Absent parents	Living with neither father nor mother	NA
New social risk exposure	Poverty in old age	NA	Living in a household with $\geq 1$ adult in old-age retirement; AND Equivalized household income <sup>b</sup> is in the lowest quartile of the sample; AND The reference person in the household, when considering the total of the household's income and expenses, reports that currently the household eats into its assets and savings, or gets into debts <sup>c</sup>
	Dual-earner household with children	Living with father and mother; AND Father in paid employment; AND Mother in paid employment	Living in a household with at least two adults in a relationship (married or unmarried) and $\geq 1$ child under 16; AND Two adults in paid employment
	Parental unemployment from a service sector job/irregular employment history	Living with father and mother; AND Father not in paid employment due to training, or unemployment from a profession classified in ISCO08 groups <sup>a</sup> 1, 2, 3, 4, 5	Living in a household with at least one active adult who experienced unemployment from a profession classified in ISCO08 groups <sup>a</sup> 1, 2, 3, 4, 5 at least twice in the 18 months preceding the survey
	Single parenthood	Living with either father or mother; AND The non-cohabitating parent is not deceased	Living in a household consisting of ego and $\geq 1$ child $< 18$ years old; AND Ego is not a widow(er)
Care obligations	Care obligations	Living in a household with another relative who is not the main income earner	Living in a household with $\geq 1$ adults and no children; AND $\geq 1$ adult not in paid employment due (at least in part) due to the fact that they are fulfilling care responsibilities

<sup>a</sup>ISCO08 1-digit groups: 1 = Managers; 2 = Professionals; 3 = Technicians and Associate professionals; 4 = Clerical support workers; 5 = Service and Sales workers; 6 = Skilled Agricultural, Forestry and Fishery Workers; 7 = Craft and Related Trades Workers; 8 = Plant and Machine Operators, and Assemblers; 9 = Elementary Occupations; 0 = Armed Forces Occupations.

<sup>b</sup>This is measured using the OECD modified scale for equivalised net household income; weights: 1st adult = 1, subsequent adults = 0.5, children = 0.3.

<sup>c</sup>Combining objective and subjective measurements of poverty in old age in Switzerland is recommended because saved contributions in the 2nd and 3rd pillars of the retirement system can be paid monthly or as a lump sum, making it difficult to measure poverty with objective income information alone (Guggisberg et al. 2013).

The preferences  $y$  of each individual  $i$  are modelled as a function of risk prevalence at 15 years old, as well as several predictor variables, including age and period, contained in the vector  $\mathbf{X}$  with their respective coefficients  $\beta$ , and respondent residual  $\epsilon_i$ .

Each empirical step estimates models for each of the four outcome variables, and I report additional models that include national contextual factors during the formative years as predictors.

## 4 | Results

### 4.1 | Social Risk and Contextual Developments

I begin by investigating how social risk exposure, as well as labour force and policy contexts, have changed over the long run. Figure 2 shows that the proportion of respondents exposed at the household level to old social risks in the formative years has declined from an average of 12% for people born in 1930 to 4% for people born in 1990. On the other hand, new social risk exposure increased steadily across people born before the 1970s from an average 35% to 53%, before plateauing and declining slightly among people born after 1980. This decline can be explained by a larger proportion of respondents born in the 1980s who grew up exposed to neither type of risk. Further analyses suggest that the trend towards greater exposure to new social risks during the formative years continues among people born after 1991.<sup>11</sup> The LOESS fit of the estimated percent of respondents in households exposed to new social risks across cohorts, represented by the dotted line in the righthand panel of Figure 2, will act as one cohort substitute in the age-period-cohort models.

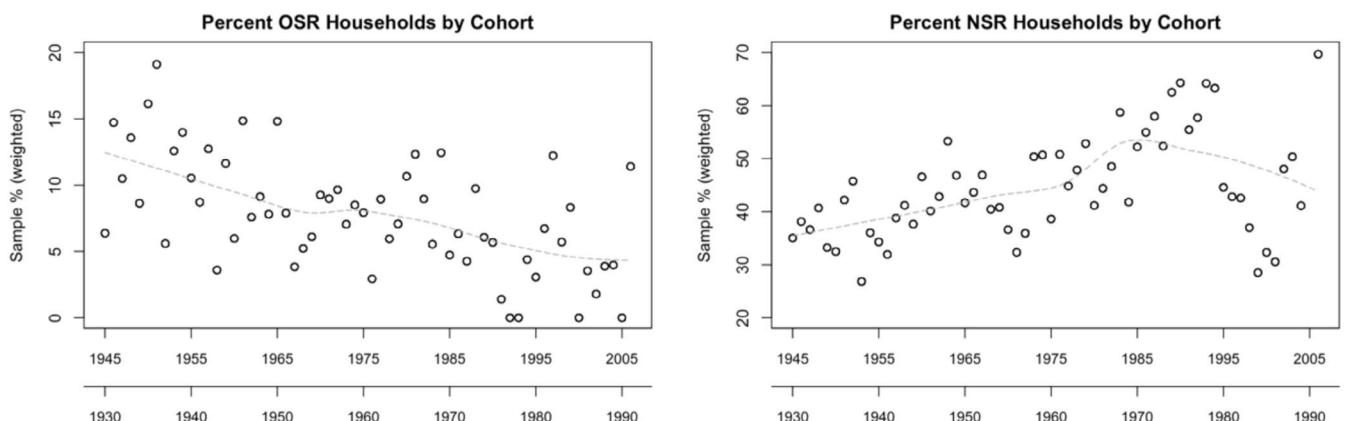
I then plot the unemployment and female labour force participation rate, as well as spending on unemployment benefits and family policies across birth cohorts. Figure 3 displays these time series data and shows that the unemployment rate remained high at the end of the Great Depression, before declining to 0% in the 1960s and early 1970s. Thereafter, it increased to around 4% up to the early 1990s. The female labour force participation rate has increased across birth years for which data are available, from 39% to 80%. Note that a break

in the data occurred in 1991 due to a measurement change, although this should not substantially bias the results due to the use of the LOESS fit as predictor. Both unemployment benefits and family policies spending increased as a proportion of GDP over the cohorts for which data are available. These spending increases appear to occur together with growing unemployment in the 1990s and a steady increase in female labour force participation, suggesting that the Swiss welfare state responded to changing labour market conditions, and that it did not remain 'frozen' (Esping-Andersen 1996).

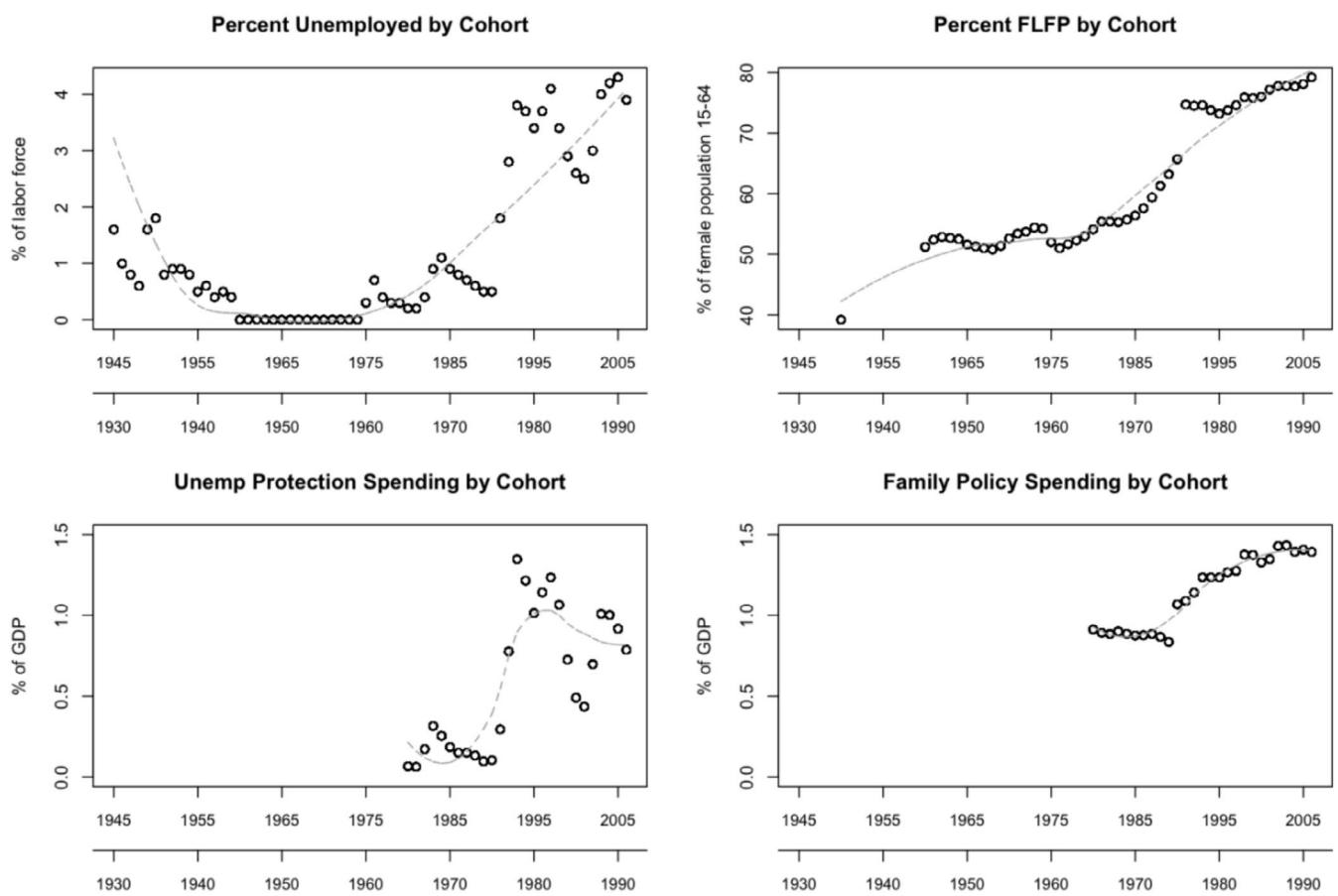
Overall, the patterns presented here suggest that cohorts born more recently spent their formative years disproportionately exposed to new social risks at the household level, and at the national level to a higher unemployment rate, to a high proportion of women in paid employment, and to somewhat higher spending on unemployment and family policies than those born and raised earlier.

### 4.2 | Welfare Spending Preferences

With these social risks and contextual developments outlined, the analyses turn to how socialisation during the formative years may correlate with spending preferences later in life.<sup>12</sup> Table 2 provides evidence that respondents' household characteristics at the age of 15 influence spending preferences. Compared to those who did not experience either type of social risk, exposure to old social risks is mildly associated with higher support for retirement, unemployment benefits, and childcare in some models, and exposure to new social risks is associated with higher support for childcare and for social aid, all else equal. Being categorised as exposed to both types of social risks at age 15, however, is not associated with any significant differences in support. The magnitude of most effect sizes for exposure to both types of social risks is similar to the other categories of this predictor variable, and the 95% confidence intervals are somewhat larger. This could suggest that exposure to both types of social risks does not produce statistically significant results because the low number of observations in this group ( $N=120$ , see Supporting Information S1: Table 2). These models also control for respondents' current household conditions, age, the year in which they



**FIGURE 2 |** Weighted sample percent of respondents exposed to old and new social risks at the household level at the age of 15 showing how predominant risk exposure has evolved over the long run. The dotted lines represent the LOESS fit. NB: The lower X-axis displays the year of birth, and the upper X-axis displays year of birth +15, or the year to which the respondent refers when answering the retrospective survey questions. The scatterplot begins at birth year 1930 due to the low number of observations of individuals born before then.



**FIGURE 3** | Labour market and policy conditions by year. The dotted lines represent the LOESS fit. *NB:* Data for FLFP before 1949 and from 1951 to 1959 are missing. Spending data are unavailable before 1980. The dotted lines represent the LOESS fit. The lower *X*-axis displays the year of birth, and the upper *X*-axis displays year of birth +15, or the year defined as the formative moment for a given birth cohort. *Source:* Gauthier 2011; ILO 1946, 1955; OECD 2024a, 2024b.

responded to the survey, and other sociodemographic characteristics, helping to ensure that confounding temporal and social group effects are reduced.

Several remarks can be made from these results. First, they present evidence that past risk exposure during the formative years influences attitudes later in respondents' lives, at the time of surveying. The family circumstances that respondents experienced early in life may be an important socialisation mechanism for developing durable expectations of the welfare state. More specifically, those exposed to either type of social risk appear to support higher spending than those who grew up in more secure households, suggesting that early-life exposure to old or new social risks is associated with higher support for welfare spending (Hacker and Rehm 2022). However, the type of social risk with which people come of age appears to condition the type of redistributive actions that they prefer as adults. People who grew up in a context of old social risks seem to be weakly more favourable to compensatory policies such as retirement and unemployment compared to those exposed to neither risk. The association between early-life exposure to new social risks and support for more childcare spending at the time of surveying is strong, suggesting that this type of risk exposure may be correlated with support for employment-oriented policies. Exposure to new social risks

at 15 years of age is also correlated with support for higher spending on social aid, a domain that may cover both old and new social risks. For those who did not grow up in a household that conformed to the male breadwinner model—for example, living with a widowed parent—social aid may have been an effective protection against poverty. It may also effectively cover new social risks when strict eligibility requirements exclude people from receiving other types of protection, or when demographic changes increase the risk of poverty for certain social groups such as the elderly (Huber and Stephens 2007).

These results taken together suggest that exposure to social risks in the household during the formative years is associated with higher support for welfare spending, leading Hypothesis H1 to be accepted. Additionally, there may be a differentiation in support patterns between people exposed to different types of risks at the age of 15, with old social risk exposure being correlated with support for compensatory policies and new social risk exposure being correlated with favourability for more childcare and social aid spending. This leads me to conditionally accept Hypothesis H2, with the caveat that the dichotomy between old social risk exposure and support for compensation, versus new social risk exposure and support for activation should be nuanced. This discussion is elaborated in the conclusion.

**TABLE 2** | The estimated effect of risk exposure at 15 years old on spending preferences later in life.

	Spending on							
	Retirement	Unemp. Bens.		Childcare		Social aid		
Risk type @ 15: Old (ref: Neither)	0.047*	0.048*	0.047*	0.021	0.050*	0.044	-0.071	0.015
	(0.019)	(0.019)	(0.020)	(0.034)	(0.025)	(0.026)	(0.044)	(0.023)
Risk type @ 15: New (ref: Neither)	0.012	0.018	0.017	0.008	0.065***	0.067***	0.083***	0.028*
	(0.010)	(0.010)	(0.010)	(0.015)	(0.013)	(0.013)	(0.019)	(0.012)
Risk type @ 15: Both (ref: Neither)	0.022	-0.027	-0.023	0.050	0.015	-0.043	-0.046	-0.067
	(0.053)	(0.054)	(0.054)	(0.108)	(0.069)	(0.072)	(0.140)	(0.064)
Unemployment rate @ 15 (% of labour force)			-0.022					
			(0.015)					
Spending on unemployment benefits @ 15 (% GDP)			-0.008					
			(0.041)					
FLFP @ 15 (% female population 15–64)						0.012***		
						(0.003)		
Spending on family policies @ 15 (% GDP)						0.386*		
						(0.160)		
<b>Controls not shown (see Appendix)</b>								
Constant	0.249***	-0.332***	-0.098	-0.361*	0.176	-1.043*	-1.473***	-0.170*
	(0.072)	(0.073)	(0.180)	(0.164)	(0.093)	(0.411)	(0.406)	(0.086)
Observations	12,955	12,955	12,830	5072	12,955	12,429	5072	12,955
R <sup>2</sup>	0.076	0.053	0.053	0.049	0.065	0.067	0.101	0.058
Adjusted R <sup>2</sup>	0.072	0.050	0.050	0.040	0.061	0.064	0.093	0.055

Note: NB: Controls for the household risk exposure at the time of surveying, the period effect (the year of surveying), age, age<sup>2</sup>, sex, highest educational attainment, and region of residence are not shown. Supporting Information S1: Table 4 presents the full results.

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

Beyond the family context, there is some evidence that female labour force participation and spending on family policies during the formative years may be associated with spending preferences at the time of surveying. Growing up with a higher proportion of women in the labour force and greater spending on family policies appears to be correlated with higher support for childcare, suggesting that socioeconomic change and policy adaptation may socialise individuals to desire greater state intervention in this welfare domain, creating positive feedback. Importantly, this seems to act as an additional socialisation source to early-life social risk exposure, suggesting that both family conditions and institutional arrangements may socialise welfare attitudes. Nevertheless, these results should be interpreted carefully, given the birth cohorts and number of observations that can be included in these models is restricted by lack of policy data for much of the postwar era.

Overall, these models suggest that people may not just consider their immediate circumstances when asked about their support for the welfare state, but may also be marked by their past conditions as they were coming of age. What consequences may this finding hold for intergenerational shifts in spending preferences? As cohorts born more recently grow up in a context of

prevalent new social risks, they may also increasingly support an activating policy framework, contributing to an intergenerational shift in welfare state expectations.

As mentioned, I use the predicted LOESS fit of the percent of respondents exposed to new social risks when respondents were 15 years old as predictors for support for spending. Table 3 presents the temporal results, and Supporting Information S1: Table 5 presents the full results. Although the direction of the effects appears to suggest that an increasing prevalence of new social risks in the population when respondents were 15 years old is associated with a mild increase in support for childcare spending and a decrease in support for other domains, these effects are only occasionally statistically significant.

This may be because the growth in predominance of new social risks across cohorts is not sufficiently robust to capture a definitive effect. Recall that new social risk exposure plateaued and declined among people born since the 1970s in the sample, suggesting that there may not be a strong differentiation in social risk exposure across generations. In other words, the prevalence of new social risk exposure is similar between people born in

**TABLE 3** | Age, period, and cohort substitute effects models.

	Spending on							
	Retirement		Unemp. Bens.		Childcare		Social aid	
New Social Risk Predicted Percent @ 15 (0-100)	-0.003*	-0.003	-0.003	-0.001	0.001	0.005*	0.008	-0.002
Unemployment rate @ 15 (% of labour force)			-0.019					
Spending on unemployment benefits @ 15 (% GDP)				-0.009				
FLFP @ 15 (% female population 15–64)						0.014***		
Spending on family policies @ 15 (% GDP)							0.380*	
Year: 2014 (ref: 2011)	0.029*	-0.093***	-0.090***	-0.076***	-0.051***	-0.083***	-0.075**	-0.140***
	(0.011)	(0.011)	(0.012)	(0.020)	(0.015)	(0.017)	(0.027)	(0.014)
Year: 2017 (ref: 2011)	0.072***	-0.086***	-0.081***	-0.091***	-0.072***	-0.131***	-0.121***	-0.088***
	(0.012)	(0.012)	(0.012)	(0.025)	(0.015)	(0.021)	(0.035)	(0.014)
Age	0.009***	0.017***	0.010	0.010	-0.003	0.014*	0.042*	0.009**
	(0.002)	(0.002)	(0.006)	(0.016)	(0.003)	(0.007)	(0.020)	(0.003)
Age <sup>2</sup>	-0.0001***	-0.0001***	-0.0001	-0.0001	0.00004	-0.00003	-0.001*	-0.0001
	(0.00002)	(0.00003)	(0.0001)	(0.0002)	(0.00003)	(0.00005)	(0.0002)	(0.00003)
<b>Controls not shown (see Appendix)</b>								
Constant	0.341***	-0.236**	-0.040	-0.314	0.231*	-1.360**	-1.402***	-0.108
	(0.083)	(0.084)	(0.180)	(0.167)	(0.108)	(0.443)	(0.405)	(0.100)
Observations	12,844	12,844	12,844	5086	12,844	12,443	5086	12,844
R <sup>2</sup>	0.076	0.052	0.053	0.049	0.063	0.065	0.096	0.058
Adjusted R <sup>2</sup>	0.073	0.049	0.049	0.041	0.060	0.062	0.089	0.055

Note: NB: Controls for sex, highest educational attainment, and region of residence are not shown. Supporting Information S1: Table 5 presents the full results.  
\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

1960 and 1990. Additional analyses (Supporting Information S1: Figure 1) show that new social risk exposure increased to the highest levels among people born in the mid-1990s and who fall outside the inclusion criteria of the sample. Future research that accounts for cohorts born more recently than 1991 may therefore be warranted. Nevertheless, the results presented here lead to the rejection of Hypothesis H3, that an increasing predominance of new social risks over birth cohorts will be associated with an intergenerational increase in spending support for employment-oriented policies.

Turning to the other temporal effects in these models, support levels for retirement appear to increase gradually over time, and to decrease for other spending domains (Table 3). A couple interpretations can be put forward for these period effects.

First, they may be attributable to a decrease in exposure to risks of poor outcomes like job loss or poverty after the 2008 global financial crisis and as the Swiss economy improved over the 2010s. Second, political narratives may also play a role, given the success of the far-right, Swiss People's Party in 2015. This could partially explain the decrease in spending support on domains that often benefit immigrants like unemployment and social aid, compared to Swiss citizens like retirement. Testing these interpretations is beyond the scope of this article, although I discuss the possible influence of political narratives over the long run in more detail in the conclusion.

Regarding age effects, support appears to take on an inverse-U shape across the life cycle for most spending domains and model iterations (Table 3). For example, support for retirement

is estimated to peak between 50 and 60 years old, which is perhaps unsurprising from a self-interest perspective as people are likely to support the policies that benefit them most at their point in the life cycle. Meanwhile, support for unemployment benefits and social aid are estimated to increase across much of the life course, not peaking until well after retirement age. This is surprising in the case of unemployment benefits, which could be expected to peak during the working years. I postulate that this may reflect cumulative exposure to unemployment risk over the career, so that people who worked for three or four decades may have been more likely to experience risk of job loss than those who recently joined the labor market. Finally, support for childcare is estimated to remain quite stable over the life course. This may reflect the fact that in the Swiss context where parents often rely on family for childcare solutions, both new parents and grandparents may be similarly supportive of robust childcare, leading estimated support to appear steady across the life course. Again, testing these interpretations extends beyond the scope of the article. The conclusion to be drawn here is that each temporal effect may be estimated more accurately when all three of the terms are appropriately included in the model.

## 5 | Conclusion

This study investigates the influence of early-life socialisation on adults' welfare attitudes, and seeks to understand whether intergenerational shifts in socialisation experiences may correspond to shifts in popular expectations of the welfare state. The analyses suggest that material conditions in the household during the formative, teenage years are associated with welfare spending preferences when people are older, and more specifically that growing up in a family that was exposed to old or new social risks may influence higher redistributive support when individuals are surveyed later in the life course. This remark suggests that past risk of relying on the welfare state for maintaining a decent standard of living may durably influence preferences for robust redistributive measures.

The analyses also provide evidence that experiences with old and new social risks are associated with favorability for compensatory and employment-oriented policies, respectively. More specifically, growing up in a household exposed to old social risks is associated with greater support for retirement, and in some models, unemployment benefits and childcare spending than growing up exposed to neither risk. Two interpretations for these patterns can be advanced. First, old social risk exposure involves direct experiences with parents who were unemployed or retired from a manual job, suggesting a direct material source of socialisation. Second, growing up in a context of old social risks could also create a context conducive to the development of concerns with income insecurity. In this case, high support for retirement and even childcare—due to high childcare costs in Switzerland—could reflect political learning from risk exposure, rather than direct, material socialisation.

The results present weak evidence that new social risk exposure in the formative years is correlated with support for higher spending on social aid, perhaps reflecting support for a safety net in a social policy context that does not cover new social risks

well. While social assistance can be understood as a welfare domain that may protect against poverty resulting from new social risk exposure (Huber and Stephens 2007), it is not explicitly an employment-oriented policy. The correlation between early-life new social risk exposure and support for childcare appears particularly strong. Spending the teenage years in a household with a single parent or where both parents were present and working may instill the need for more robust childcare, especially if these arrangements created difficulties for employed adults to reconcile work and family life. Taken together, these preference patterns may be appropriately understood as reflecting the welfare domains that best cover the type of risk to which the individual's family was exposed while they grew up. While this division can be broadly viewed as a distinction between compensatory and employment-oriented policy support, as reflected by hypothesis H2, these interpretations suggest a more nuanced story than a simple dichotomy.

The results find some evidence that an intergenerational shift in social risk exposure has been accompanied by a change in preferences in favour of greater childcare spending, although the effect is weak. This may be partially explained by the fact that the shift in social risk exposure across birth cohorts is not robust enough to lead to a clear intergenerational development in spending preferences. Nevertheless, future research should examine the possibility of intergenerational changes in redistributive preferences, especially given that cohorts not captured in the sample of this study and born later in the 1990s appear to have the highest rates of new social risk exposure. From a methodological perspective, the appropriate inclusion of age, period, and cohort effects can allow welfare attitudes researchers to more accurately identify each of the three temporal effects by reducing unobserved variable bias. The results presented in this study suggest that considering separate temporal effects in longitudinal studies of redistributive preferences is appropriate.

The study brings a few contributions to the social policy literature and to our understanding of individuals' welfare state expectations. First, the conditions under which people spend their formative years seem to matter for attitudes later in life, suggesting that socialisation is associated with durable preferences. The study also sheds light on which early-life conditions are important for attitudes later in the life course. While research on welfare attitudes have primarily emphasised policy frameworks as the mechanism through which individuals are socialised into normative conceptions of the welfare state (Svallfors 2007), political scientists have pointed to the family as the most important agent of socialisation into political values (Hyman 1959; Inglehart 1977, 1990). The results presented in this study suggest that the family composition as individuals come of age may be an overlooked source of durable welfare attitudes. This provides a temporal extension to the remark that concurrent social risk exposure is an important influence on preferences (Rehm 2009; Rehm et al. 2012). Finally, preferences also develop over time and across the life cycle, suggesting that age, period, and cohort all matter for welfare attitudes. While numerous studies have focused on the role that time and age play on attitude change, very few have paid serious attention to the influence of past conditions on current preferences. This study encourages a more complete temporal understanding of individuals' welfare state expectations in part because controlling for cohort draws

attention to the ways in which past social and economic contexts continue to influence contemporary attitudes.

The study also comes with some limitations. First, the operationalization of social risk exposure is empirically driven and dependent upon data availability, meaning that there may be some misalignments with previous definitions of old and new social risks. Future research may wish to look more closely at specific types of risk exposure during the formative years and their possible consequences for welfare attitudes later in life. For example, how has the rise of dual-earner and single parents influenced a generational shift in support for different kinds of family policy? Second, data on past conditions are incomplete and need to be selected carefully by the researcher when studying early-life socialisation effects. Data selection is theoretically justified based on past research—socialisation from the family (Hyman 1959; Inglehart 1977) and from the policy context (Mau 2003; Rothstein 1998)—and the results are confirmed by ensuring the conclusions drawn from different model iterations remain similar. Nevertheless, some models in this study are restricted by a lack of contextual information for people who experienced their formative years before the 1970s. Additionally, people born after 1991 were too young at the time of surveying to be included in the study. Further research should be conducted on these cohorts whose members spent their formative years in a period that some researchers identify as an era focused on activation and social investment (Hemerijck 2013; Morel et al. 2012), and which began in the 2000s in Switzerland (Häusermann 2010).

Switzerland may be a likely case to find attitudinal consequences of new social risk exposure because its welfare state has been slow to protect against it. Nonetheless, this remark should be situated in a comparative perspective. Sweden has been shown to maintain a bedrock of support for its welfare state (Svallfors 2011). To what extent may this be different in Switzerland? To expand this research agenda, scholars may focus on a cross-country comparison of attitudes (Ebbinghaus and Naumann 2017; Kumlin and Stadelmann-Steffen 2014) that can be used to understand whether different welfare state adaptation strategies may attenuate or exacerbate changes in support across generations. This can help distinguish the attitudinal consequences of the political economy pressures that have transformed labor markets, family structures, and predominant social risk exposure similarly across high-income countries, and the policy responses individual welfare states have taken to protect their populations against these changes.

The welfare state has a dual task of ensuring smooth economic functioning and political legitimization among the population (Offe 1984; see also Habermas 1975). Empirical investigations of long-run developments in expectations of the welfare state shed light on popular perceptions of the fulfilment of this dual task, which I contend is crucial now as governments have had to adapt social policy frameworks to changing socioeconomic structures since the postindustrial turn (Pierson 1994, 1998, 2001). Material needs early in life appear crucial for the formation of durable welfare expectations, suggesting that the legitimacy of the welfare state is reliant upon people's socialisation. From the aggregate level, any intergenerational developments in attitudes are consequential for legitimization processes because they suggest permanent change in popular expectations of the welfare state. This is

because newer cohorts grow up to replace older ones in a process of generational replacement. As a result, future research should continue to examine cohort changes in welfare attitudes in more detail to uncover how perceptions of the welfare state's role may evolve over the long term.

A generational perspective is a new frontier for social policy (Daly 2020), and further consideration of how individuals' formative years may durably influence their welfare attitudes is warranted. Doing so opens a new research agenda for shedding light on the attitudinal side of social change and welfare state adaptation over the long run. While we know much about the institutional shifts that have taken place since the post-industrial turn, the popular support patterns that can ease or challenge these changes in a democratic context remain understudied. Turning our focus back to this aspect highlighted in foundational texts in comparative social policy can help scholars complement their understanding of welfare state change in the long run.

## Funding

The author has nothing to report.

## Conflicts of Interest

The author declares no conflicts of interest.

## Data Availability Statement

The data that support the findings of this study are openly available in SWISSUbase at <https://doi.org/10.48573/pjmf-8s41>, reference number 932.

## Endnotes

<sup>1</sup> See the Appendix for replications of the main analyses on unbalanced panels.

<sup>2</sup> The link between early-life risk exposure and support for retirement spending may reflect a broader concern with income security rather than direct experience with old-age risks during the formative years. Individuals who grew up in households facing financial instability may generalise these experiences into support for policies that ensure stability later in life, including pensions. This may be a more indirect mechanism than for unemployment or childcare support, which may reflect more direct experiences with these risks in the household during the formative years. Nevertheless, the values on all four outcome variables provide a wide coverage of welfare spending domains and may be consistent with the idea that early exposure to social risks fosters durable expectations of the welfare state.

<sup>3</sup> This categorization of risk exposure is schematic and may contain some minor conceptual imprecisions. For example, care duties in a postindustrial context have generated increasing material and scheduling insecurities as dual-earner family arrangements and limited public care provision intersect. This suggests that care obligations may not entail the same degree of social risk across generations, and therefore that they may not reflect the same level of vulnerability across the entire sample. This possibility may not compromise the empirical results, but it suggests that they better reveal overall shifts in exposure patterns rather than the absolute intensity of any single risk.

<sup>4</sup> Because risk exposure is operationalized at the household level, having several dependent family members may raise the level of risk. Due to data limitations in the retrospective information, the categorization does not take the number of dependent individuals, such as the number of ego's siblings, in the household into account.

<sup>5</sup> Controlling for the influence of institutional arrangements at the regional level during the formative is not possible because the respondent's canton of residence at 15 years old is unavailable in the retrospective data. Although many welfare spending domains underwent nationalisation processes before the 1980s, this data limitation is unfortunate given cross-cantonal heterogeneity in universality of some policies like unemployment insurance following WWII.

<sup>6</sup> I limit these further analyses to these two outcome variables for two reasons. First, family and labor market protection policies have been at the core of welfare state change in recent decades (Ferragina 2022), suggesting that it is crucial to understand how intergenerational shifts in expectations for these two welfare domains may proceed. Second, time-series data to create macro contextual predictors that may influence individuals' attitudes towards specific spending domains during their formative years (e.g., the poverty rate for preferences for spending on social aid) are rarely available on a sufficiently long-term scale to capture a cross-cohort effect. This data limitation constrains the macro-level information that can be included in the models.

<sup>7</sup> Supporting Information S1: Appendix Table 1 provides information on the correlation between risk exposure at 15 and at the time of surveying.

<sup>8</sup> Educational attainment is categorised as 0. Incomplete compulsory school; 1. Compulsory school, elementary vocational training; 2. Domestic science course, 1 year school of commerce; 3. General training school; 4. Apprenticeship (CFC, EFZ); 5. Full-time vocational school; 6. Bachelor/maturity; 7. Vocational high school with master certificate, federal certificate; 8. Technical or vocational school; 9. Vocation high school ETS, HTL, etc.; 10. University, academic high school, HEP, PH, HES, FH.

<sup>9</sup> This is equivalent to the 26 cantons of Switzerland. I group residents of Appenzell Innerrhoden and Appenzell Ausserrhoden together, and of Nidwalden and Obwalden together due to a low number of respondents, yielding 24 geographical units.

<sup>10</sup> I do not control for parental or ego occupation because these are somewhat endogenous to the measure of social risks, which uses occupational categories for some groupings. For example, old social risks are primarily understood to affect people working in manual occupations that are predominant in an industrial labour market. However, I conduct robustness checks that include ego's occupation as a control (Supporting Information S1: Appendix Tables 6 and 7), and the results allow for nearly the same conclusions advanced in the main text.

<sup>11</sup> Specifically, they show that among the weighted sample of respondents born between 1992 and 1997 (the youngest birth year for which there is data), 67.3% were exposed to new social risks at the household level at 15 years old, and only one of these birth years (1993) averages less than 60% exposure to new social risks. To show the numbers of respondents included in these scatterplots, Supporting Information S1: Appendix Figure 1 visualises histograms of household risk exposure across all birth years for which there is data.

<sup>12</sup> The main text focuses primarily on presenting and interpreting temporal effects. Remaining regression results, notably sociodemographic differences in support, are presented and briefly discussed in the Appendix.

## References

Antal, E., and M. Rothenbuhler. 2015. "Weighting in the Swiss Household Panel Technical Report."

Armingeon, K. 2001. "Institutionalising the Swiss Welfare State." *West European Politics* 25: 145–168.

Armingeon, K., and G. Bonoli. 2007. *The Politics of Post-Industrial Welfare States: Adapting Post-War Social Policies to New Social Risks*. Routledge.

Berney, L. R., and D. B. Blane. 1997. "Collecting Retrospective Data: Accuracy of Recall After 50 Years Judged Against Historical Records." *Social Science & Medicine* 45, no. 10: 1519–1525. [https://doi.org/10.1016/S0277-9536\(97\)00088-9](https://doi.org/10.1016/S0277-9536(97)00088-9).

Bleses, P., and M. Seeleib-Kaiser. 2004. *The Dual Transformation of the German Welfare State*. Palgrave Macmillan.

Blossfeld, H. P. 1986. "Career Opportunities in the Federal Republic of Germany: A Dynamic Approach to the Study of Life-Course, Cohort, and Period Effects." *European Sociological Review* 2, no. 3: 208–225.

Bonoli, G. 2005. "The Politics of the New Social Policies: Providing Coverage Against New Social Risks in Mature Welfare States." *Policy & Politics* 33, no. 3: 431–449. <https://doi.org/10.1332/0305573054325765>.

Bonoli, G. 2007. "Time Matters: Postindustrialization, New Social Risks, and Welfare State Adaptation in Advanced Industrial Democracies." *Comparative Political Studies* 40, no. 5: 495–520. <https://doi.org/10.1177/0010414005285755>.

Brooks, C., and J. Manza. 2007. *Why Welfare States Persist: The Importance of Public Opinion in Democracies*. University of Chicago Press.

Busemeyer, M. R., A. Goerres, and S. Weschle. 2009. "Attitudes Towards Redistributive Spending in an Era of Demographic Ageing: The Rival Pressures From Age and Income in 14 OECD Countries." *Journal of European Social Policy* 19, no. 3: 195–212. <https://doi.org/10.1177/0958928709104736>.

Campbell, C. 2016. "The Formative Years, Economic Hardship, and Beliefs About the Government's Role in Lessening Poverty." *Social Problems* 63, no. 2: 244–265. <https://doi.org/10.1093/socpro/spw008>.

Castles, F. 2009 [1978]. *The Social Democratic Image of Society (Routledge Revivals): A Study of the Achievements and Origins of Scandinavian Social Democracy in Comparative Perspective*. Routledge.

Chauvel, L., and M. Schröder. 2014. "Generational Inequalities and Welfare Regimes." *Social Forces* 92, no. 4: 1259–1283. <https://doi.org/10.1093/sf/sot156>.

Clasen, J., and D. Clegg. 2007. "New Labour Market Risks and the Revision of Unemployment Protection Systems in Europe." In *The Politics of Post-Industrial Welfare States: Adapting Post-War Social Policies to New Social Risks*, edited by K. Armingeon and G. Bonoli. Routledge.

Clegg, D. 2007. "Continental Drift: On Unemployment Policy Change in Bismarckian Welfare States." *Social Policy & Administration* 41, no. 6: 597–617. <https://doi.org/10.1111/j.1467-9515.2007.00574.x>.

Daly, M. 2011. "What Adult Worker Model? A Critical Look at Recent Social Policy Reform in Europe From a Gender and Family Perspective." *Social Politics: International Studies in Gender, State & Society* 18, no. 1: 1–23.

Daly, M. 2020. "Generations, Age and Life Course: Towards an Integral Social Policy Framework of Analysis." *Contemporary Social Science* 15, no. 3: 291–301. <https://doi.org/10.1080/21582041.2018.1455107>.

Daly, M., and J. Lewis. 2000. "The Concept of Social Care and the Analysis of Contemporary Welfare States." *British Journal of Sociology* 51, no. 2: 281–298. <https://doi.org/10.1111/j.1468-4446.2000.00281.x>.

Dex, S. 1995. "The Reliability of Recall Data: A Literature Review." *Bulletin of Sociological Methodology/Bulletin de Méthodologie Sociologique* 49, no. 1: 58–89. <https://doi.org/10.1177/075910639504900105>.

Dingeldey, I. 2007. "Between Workfare and Enablement—The Different Paths to Transformation of the Welfare State: A Comparative Analysis of Activating Labour Market Policies." *European Journal of Political Research* 46, no. 6: 823–851. <https://doi.org/10.1111/j.1475-6765.2007.00712.x>.

Ebbinghaus, B. 2009. "Can Path Dependence Explain Institutional Change? Two Approaches Applied to Welfare State Reform." In *The Evolution of Path Dependence*, edited by L. Magnusson and J. Ottosson. Edward Elgar Publishing.

Ebbinghaus, B., and E. Naumann. 2017. *Welfare State Reforms Seen From Below: Comparing Public Attitudes and Organized Interests in Britain and Germany*. Springer.

Elder, G. H., and J. Z. Giele. 2009. *The Craft of Life Course Research*. Guilford Press.

Emmenegger, P., S. Häusermann, B. Palier, and M. Seeleib-Kaiser. 2012. *The Age of Dualization: The Changing Face of Inequality in Deindustrializing Societies*. Oxford University Press.

Esping-Andersen, G. 1985. *Politics Against Markets: The Social Democratic Road to Power*. Princeton University Press.

Esping-Andersen, G. 1990. *The Three Worlds of Welfare Capitalism*. Princeton University Press.

Esping-Andersen, G. 1996. *Welfare States in Transition: National Adaptations in Global Economies*. SAGE.

Esping-Andersen, G. 2009. *Incomplete Revolution: Adapting Welfare States to Women's New Roles*. Polity.

Farkas, G. 1977. "Cohort, Age, and Period Effects Upon the Employment of White Females: Evidence for 1957–1968." *Demography* 14, no. 1: 33–42. <https://doi.org/10.2307/2060453>.

Ferragina, E. 2022. "Welfare State Change as a Double Movement: Four Decades of Retrenchment and Expansion in Compensatory and Employment-Oriented Policies Across 21 High-Income Countries." *Social Policy & Administration* 56, no. 5: 705–725. <https://doi.org/10.1111/spol.12789>.

Ferragina, E., A. Arrigoni, and T. F. Spreckelsen. 2022. "The Rising Invisible Majority: Bringing Society Back Into International Political Economy." *Review of International Political Economy* 29, no. 1: 114–151.

Ferragina, E., and A. Zola. 2022. "The End of Austerity as Common Sense? An Experimental Analysis of Public Opinion Shifts and Class Dynamics During the Covid-19 Crisis." *New Political Economy* 27, no. 2: 329–346. <https://doi.org/10.1080/13563467.2021.1952560>.

Fosse, E., and C. Winship. 2019. "Analyzing Age-Period-Cohort Data: A Review and Critique." *Annual Review of Sociology* 45, no. 1: 467–492. <https://doi.org/10.1146/annurev-soc-073018-022616>.

Gauthier, A. H. 2011. "Comparative Family Policy Database, Version 3 [Computer File]." Netherlands Interdisciplinary Demographic Institute and Max Planck Institute for Demographic Research (Distributors). [www.demogr.mpg.de](http://www.demogr.mpg.de).

Grasso, M. T. 2014. "Age, Period and Cohort Analysis in a Comparative Context: Political Generations and Political Participation Repertoires in Western Europe." *Electoral Studies* 33: 63–76. <https://doi.org/10.1016/j.electstud.2013.06.003>.

Grasso, M. T., S. Farrall, E. Gray, C. Hay, and W. Jennings. 2019. "Thatcher's Children, Blair's Babies, Political Socialization and Trickle-Down Value Change: An Age, Period and Cohort Analysis." *British Journal of Political Science* 49, no. 1: 17–36. <https://doi.org/10.1017/S0007123416000375>.

Guggisberg, M., S. Häni, and S. Fleury. 2013. "Poverty Measurement in Switzerland." In *Economic and Social Situation of the Population*. Federal Statistical Office (FSO).

Habermas, J. 1975. *Legitimation Crisis*. Beacon Press.

Hacker, J. S., and P. Rehm. 2022. "Reducing Risk as Well as Inequality: Assessing the Welfare State's Insurance Effects." *British Journal of Political Science* 52, no. 1: 456–466. <https://doi.org/10.1017/S000712342000034>.

Häusermann, S. 2010. "Reform Opportunities in a Bismarckian Latecomer: Restructuring the Swiss Welfare State." In *A Long Goodbye to Bismarck?* edited by B. Palier. Amsterdam University Press.

Hemerijck, A. 2013. *Changing Welfare States*. Oxford University Press.

Huber, E., and J. D. Stephens. 2007. "Combating Old and New Social Risks." In *The Politics of Post-Industrial Welfare States: Adapting Post-War Social Policies to New Social Risks*, edited by K. Armingeon and G. Bonoli. Routledge.

Hyman, H. 1959. *Political Socialization: A Study in the Psychology of Political Behavior*. Free Press.

ILO. 1946. *Yearbook of Labour Statistics* (9). ILO.

ILO. 1955. *Yearbook of Labour Statistics* (15). ILO.

Inglehart, R. 1977. *The Silent Revolution: Changing Values and Political Styles Among Western Publics*. Princeton University Press.

Inglehart, R. 1990. *Culture Shift in Advanced Industrial Society*. Princeton University Press.

Iversen, T., and D. Soskice. 2001. "An Asset Theory of Social Policy Preferences." *American Political Science Review* 95, no. 4: 875–893.

Jessop, B. 1993. "Towards a Schumpeterian Welfare State? Preliminary Remarks on Post-Fordist Political Economy." *Studies in Political Economy* 40, no. 1: 7–39. <https://doi.org/10.1080/19187033.1993.11675409>.

Korpi, W. 1980. "Social Policy and Distributional Conflict in the Capitalist Democracies. A Preliminary Comparative Framework." *West European Politics* 3, no. 3: 296–316. <https://doi.org/10.1080/01402388008424288>.

Korpi, W. 1983. *The Democratic Class Struggle*. Routledge.

Krosnick, J. A., and D. F. Alwin. 1989. "Aging and Susceptibility to Attitude Change." *Journal of Personality and Social Psychology* 57, no. 3: 416–425. <https://doi.org/10.1037/0022-3514.57.3.416>.

Kumlin, S., and I. Stadelmann-Steffen. 2014. *How Welfare States Shape the Democratic Public: Policy Feedback, Participation, Voting, and Attitudes*. Edward Elgar Publishing.

Laenen, T. 2018. "Do Institutions Matter? The Interplay Between Income Benefit Design, Popular Perceptions, and the Social Legitimacy of Targeted Welfare." *Journal of European Social Policy* 28, no. 1: 4–17. <https://doi.org/10.1177/0958928718755777>.

Laenen, T., and B. Meuleman. 2017. "A Universal Rank Order of Deservingness? Geographical, Temporal and Social-Structural Comparisons." In *The Social Legitimacy of Targeted Welfare: Attitudes to Welfare Deservingness*, edited by W. van Oorschot, F. Roosma, B. Meuleman, and T. Reeskens. Edward Elgar Publishing.

Lersch, P. M., W. Schulz, and G. Leckie. 2020. "The Variability of Occupational Attainment: How Prestige Trajectories Diversified Within Birth Cohorts Over the Twentieth Century." *American Sociological Review* 85, no. 6: 1084–1116. <https://doi.org/10.1177/003122420966324>.

Lewis, J. 1992. "Gender and the Development of Welfare Regimes." *Journal of European Social Policy* 2, no. 3: 159–173. <https://doi.org/10.1177/095892879200200301>.

Mannheim, K. 1959 [1928]. "The Problem of Generations." In *Essays on the Sociology of Knowledge*. Routledge & K. Paul.

Margalit, Y. 2013. "Explaining Social Policy Preferences: Evidence From the Great Recession." *American Political Science Review* 107, no. 1: 80–103. <https://doi.org/10.1017/S0003055412000603>.

Mason, K. O., W. M. Mason, H. H. Winsborough, and W. K. Poole. 1973. "Some Methodological Issues in Cohort Analysis of Archival Data." *American Sociological Review* 38, no. 2: 242–258. <https://doi.org/10.2307/2094398>.

Mason, W. M., and S. Fienberg. 2012 [1985]. *Cohort Analysis in Social Research: Beyond the Identification Problem*. Springer Science & Business Media.

Mau, S. 2003. *The Moral Economy of Welfare States: Britain and Germany Compared*. Routledge. <https://doi.org/10.4324/9780203590614>.

Meltzer, A. H., and S. F. Richard. 1981. "A Rational Theory of the Size of Government." *Journal of Political Economy* 89, no. 5: 914–927.

Morel, N., B. Palier, and J. Palme. 2012. *Towards a Social Investment Welfare State? Ideas*. Policy Press.

Naumann, E., C. Buss, and J. Bähr. 2016. "How Unemployment Experience Affects Support for the Welfare State: A Real Panel Approach." *European Sociological Review* 32, no. 1: 81–92. <https://doi.org/10.1093/esr/jcv094>.

Neundorf, A., and S. Soroka. 2018. "The Origins of Redistributive Policy Preferences: Political Socialisation With and Without a Welfare State." *West European Politics* 41, no. 2: 400–427. <https://doi.org/10.1080/0140382.2017.1388666>.

OECD. 2020. "Is Childcare Affordable? Policy Brief on Employment, Labour and Social Affairs." OECD, Oe.Cd/Childcare-Brief-2020.

OECD. 2024a. "Social Expenditure Database (SOCX)—OECD." <https://www.oecd.org/social/expenditure.htm>.

OECD. 2024b. "Historical Population Data." [https://data-explorer.oecd.org/?lc=en&pg=0&snb=1&vw=tb&df\[ds\]=dsDisseminateFinalDMZ&df\[id\]=DSD\\_POPULATION%40DF\\_POP\\_HIST&df\[ag\]=OECD.ELS.SAE&df\[vs\]=&pd=1950%2C1950&dq=CHE..PS.F.&to\[TIME\\_PERIOD\]=false](https://data-explorer.oecd.org/?lc=en&pg=0&snb=1&vw=tb&df[ds]=dsDisseminateFinalDMZ&df[id]=DSD_POPULATION%40DF_POP_HIST&df[ag]=OECD.ELS.SAE&df[vs]=&pd=1950%2C1950&dq=CHE..PS.F.&to[TIME_PERIOD]=false).

Offe, C. 1984. *Contradictions of the Welfare State*. Routledge.

Orloff, A. S. 1993. "Gender and the Social Rights of Citizenship: The Comparative Analysis of Gender Relations and Welfare States." *American Sociological Review* 58, no. 3: 303–328. <https://doi.org/10.2307/2095903>.

Palier, B. 2010. *A Long Goodbye to Bismarck? The Politics of Welfare Reform in Continental Europe*. Amsterdam University Press. <https://library.oapen.org/handle/20.500.12657/34852>.

Pierson, P. 1994. *Dismantling the Welfare State?: Reagan*. Cambridge University Press.

Pierson, P. 1998. "Irresistible Forces, Immovable Objects: Post-Industrial Welfare States Confront Permanent Austerity." *Journal of European Public Policy* 5, no. 4: 539–560. <https://doi.org/10.1080/1350769880000011>.

Pierson, P., ed. 2001. *The New Politics of the Welfare State*. Oxford University Press.

Piven, F. F., and R. Cloward. 1971. *Regulating the Poor: The Functions of Public Welfare*. Vintage.

Piven, F. F., and R. Cloward. 1977. *Poor People's Movements: Why They Succeed*. Vintage.

Rehm, P. 2009. "Risks and Redistribution: An Individual-Level Analysis." *Comparative Political Studies* 42, no. 7: 855–881. <https://doi.org/10.1177/0010414008330595>.

Rehm, P., J. S. Hacker, and M. Schlesinger. 2012. "Insecure Alliances: Risk, Inequality, and Support for the Welfare State." *American Political Science Review* 106, no. 2: 386–406. <https://doi.org/10.1017/S0003055412000147>.

Rothstein, B. 1998. *Just Institutions Matter: The Moral and Political Logic of the Universal Welfare State*. Cambridge University Press.

Rueda, D. 2005. "Insider–Outsider Politics in Industrialized Democracies: The Challenge to Social Democratic Parties." *American Political Science Review* 99, no. 1: 61–74. <https://doi.org/10.1017/S000305540505149X>.

Rueda, D. 2007. *Social Democracy Inside Out: Partisanship and Labor Market Policy in Advanced Industrialized Democracies*. OUP Oxford.

Ryder, N. B. 1965. "The Cohort as a Concept in the Study of Social Change." *American Sociological Review* 30, no. 6: 843–861. <https://doi.org/10.2307/2090964>.

Shalev, M. 1983. "The Social Democratic Model and Beyond: Two Generations of Comparative Research on the Welfare State." *Comparative Social Research* 6, no. 3: 315–351.

Stephens, J. D. 1979. *The Transition From Capitalism to Socialism*. Macmillan. <https://doi.org/10.1007/978-1-349-16171-3>.

Streeck, W., and K. A. Thelen. 2005. *Beyond Continuity: Institutional Change in Advanced Political Economies*. Oxford University Press.

Svallfors, S. 1997. "Worlds of Welfare and Attitudes to Redistribution: A Comparison of Eight Western Nations." *European Sociological Review* 13, no. 3: 283–304. <https://doi.org/10.1093/oxfordjournals.esr.a018219>.

Svallfors, S., ed. 2007. *The Political Sociology of the Welfare State: Institutions, Social Cleavages, and Orientations*. Stanford University Press.

Svallfors, S. 2008. "The Generational Contract in Sweden: Age-Specific Attitudes to Age-Related Policies." *Policy & Politics* 36, no. 3: 381–396. <https://doi.org/10.1332/030557308X307720>.

Svallfors, S. 2010. "Policy Feedback, Generational Replacement, and Attitudes to State Intervention: Eastern and Western Germany, 1990–2006." *European Political Science Review* 2, no. 1: 119–135. <https://doi.org/10.1017/S1755773909990257>.

Svallfors, S. 2011. "A Bedrock of Support? Trends in Welfare State Attitudes in Sweden, 1981–2010." *Social Policy & Administration* 45, no. 7: 806–825. <https://doi.org/10.1111/j.1467-9515.2011.00796.x>.

Taylor-Gooby, P., ed. 2004. *New Risks: The Transformation of the European Welfare State*. OUP Oxford.

Thelen, K. 2014. *Varieties of Liberalization and the New Politics of Social Solidarity*. Cambridge University Press.

Trappe, H., M. Pollmann-Schult, and C. Schmitt. 2015. "The Rise and Decline of the Male Breadwinner Model: Institutional Underpinnings and Future Expectations." *European Sociological Review* 31, no. 2: 230–242. <https://doi.org/10.1093/esr/jcv015>.

van Oorschot, W. 2000. "Who Should Get What, and Why? On Deservingness Criteria and the Conditionality of Solidarity Among the Public." *Policy & Politics* 28, no. 1: 33–48. <https://doi.org/10.1332/0305573002500811>.

Van Winkle, Z. 2020. "Family Policies and Family Life Course Complexity Across 20th-Century Europe." *Journal of European Social Policy* 30, no. 3: 320–338. <https://doi.org/10.1177/0958928719880508>.

Zola, A., E. Naumann, and P. Marzec. 2025. "COVID-19 Labor Market Protection and Support for the Welfare State: Job Retention Versus Job Loss in Four European Countries." *Social Policy & Administration* 59, no. 5: 889–911. <https://doi.org/10.1111/spol.13090>.

## Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Appendix S1:** spol70040-sup-0001-AppendixS1.docx.