Life Events, Social Identity and Values*

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Abstract

This paper explores how life events change values and social identity when both are endogenous, i.e. when individuals identify with a social group based on shared values. Life events may introduce new information that shifts a value central to their social identity, misaligning individuals with their current social group's values. Consequently, individuals may align with a new group, affecting previously unchanged values and creating spillover effects. Using cohort data, I find that life events, such as parenthood or sickness, significantly alter values and social identity. Overlooking the interdependence between values underestimates the extent to which life experiences affect individuals.

Keywords: Life Events; Social Identity; Values Dynamics; Cognitive Dissonance; Spillover Effects
JEL Codes: A13, D63, D91, Z10

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1 Introduction

The interplay between values and social identity is crucial to the social sciences, as it underlies the economic and political preferences that drive individuals' decisions in areas such as consumption, labor supply, and voting.[1] Although the literature has devoted attention to the formation of values, especially through intergenerational transmission, the dynamics of these constructs throughout the life cycle have yet to receive adequate attention.[2] This gap in the literature is particularly surprising, given that life experiences continuously introduce new information to individuals that may change their values and social identity.

In this paper, I show how life events can change values and social identity when both are considered endogenous. Individuals identify with a social group based on shared values. When a life event introduces new information, it can shift a value central to their social identity, resulting in a misalignment with the group's values. Consequently, individuals may realign with a new group, adjusting all their values, including those initially unaffected by the change, thereby creating spillover effects across values. This paper reveals a novel mechanism by which life experiences, whether economic or otherwise, can lastingly influence individuals' preferences, their social identity, and, consequently, their future economic decisions.

I introduce a novel mechanism to explain value dynamics based on endogenous social identity. Unlike most of the mechanisms identified in the literature, which predominantly occur in early life stages, this new mechanism allows for shocks to influence values throughout adulthood. Additionally, this paper is the first to document spillover effects across values by considering the multi-dimensionality of values that characterizes social identity as a cluster of values. Whereas previous studies on the dynamics of values have primarily focused on the evolution of single values (Piketty 1995, Mayda 2006, Fernández 2007, Alesina et al. 2018), this work argues that overlooking the interdependence between values may lead to underestimating the extent to which life experiences alter values.

[1] Values, such as conservatism and individualism, represent beliefs about what is important to individuals. Values differ from personality traits, which describe how individuals behave across time and situations. In contrast, values refer to what individuals consider important. For a discussion on the relationship between values, attitudes, beliefs, traits, and norms, see Schwartz (2012). Social identity is defined as the self-perception of being a member of a social group. For a review of the social identity theory, see Tajfel et al. (1979), Tajfel and Turner (2004), and Hogg (2012). For the role of social identity in consumption behavior, see Khamis et al. (2012) and Atkin et al. (2021); for its link to labor supply decisions, see Oh (2023); and for its influence on voting behavior, see Greene (1999), Greene (2004), Ben-Bassat and Dahan (2012), and Bursztyn et al. (2019).

[2] Previous research has extensively examined value formation through various mechanisms, including intergenerational transmission (Bisin and Verdier 2001, 2011, Montgomery 2010, Hiller and Baudin 2016, Alan et al. 2017, among others), the role of cultural values (Ichino and Maggi 2000, Fernández et al. 2004, Guiso et al. 2006, Fernández 2007, Giuliano 2007, Chen 2013, Alesina and Giuliano 2014), and norms (Fehr and Falk 2002, Bardi and Schwartz 2003, Tabellini 2008). Recent studies have focused on value development during childhood (Fehr et al. 2013, Doepke and Zilibotti 2017, Bašić et al. 2020).

I develop a model where the dynamics of values are disciplined by two anchoring forces: *time consistency* and *group consistency*. Time consistency implies a preference for one's current values to align closely with past values, introducing a degree of rigidity in how values evolve over time. Group consistency captures the alignment of an individual's values with those of her social identity, thereby favoring consistency with group values. Both forms of consistency derive from the concept of cognitive dissonance wherein individuals strive to mitigate the psychological discomfort associated with holding values that conflict with those of their past selves or their social identity.[3]

I begin by introducing a benchmark model featuring a single value dimension—conservatism versus progressivism—and two social identities: *rightists*, who lean more conservative, and *leftists*, who are more progressive. When social identity is endogenous, allowing the agent to choose her identity, she aligns with the group whose value is closest to hers.

Some life experiences can alter an agent's identity. A life-changing event is a shock that introduces new information (Malmendier 2021). Depending on the shock's direction, it can shift an agent's position on the conservatism–progressivism spectrum beyond the midpoint that separates the two groups. For example, consider an agent with progressive values who identifies with the leftists. If this agent undergoes a life-changing event that shifts their values towards conservatism, and if this informational shock is substantial enough, their progressivism may turn into conservatism. Consequently, the agent would now identify with the rightists and begin to align with the average level of conservatism within this new group.

I then introduce a second value dimension—individualism versus collectivism—while maintaining the two-group structure of rightists and leftists, with the former being more individualistic than the latter.[4] Consider the same agent with progressive and collectivist values, who identifies with the leftists. This agent undergoes a life-changing event similar to the previous scenario, resulting in an informational shock that increases her conservatism without affecting her collectivism. If this informational shock is large enough, she changes her social identity and becomes a rightist. Consequently, she realigns *all* her values, including her previously unaffected collectivism, to reduce the distance with those of her new group, and will converge to her new group's average values. This indirect impact on an initially unaffected value illustrates what I define as the *spillover effect* across values.

To test the model's predictions on the dynamics of values and social identity, I use data

[3] For the consequences of cognitive dissonance in Economics, see Akerlof and Dickens (1982), Konow (2000), and Bénabou and Tirole (2006), among others. Previous research has used the concept of cognitive dissonance, originally introduced by Festinger (1957) and McGuire (1960), to explore the belief–behavior relationship.

[4] I assume that the intensity of the interdependence between these two values is exogenous to the agent and mirrors the societal mapping of values; for the significance of cultural context in this mapping, see Roccas and Sagiv (2010).

from two British cohort studies which allow for the measurement of participants' values and observation of their political voting behavior across their twenties, thirties, forties, and fifties.[5] Furthermore, these data provide a full history from which life events can be used as informational shocks to values.

Measuring the values and social identity of individuals presents a significant challenge. For values, I use principal component analysis to demonstrate that variations in responses to a broad set of statements on attitudes can be effectively summarized by two dimensions: *conservatism* versus *progressivism*, and *collectivism* versus *individualism*. These dimensions align with the motivational types of values identified by Schwartz (1992, 2012).[6]

Regarding social identity, I use the political voting behavior of individuals during General Elections as a proxy. This approach reveals that the distribution of average voters aligns with the two-dimensional value space, consistent across different cohorts and time periods. For instance, voters of the Conservative Party generally exhibit more conservative and individualist values, while Labour Party voters tend to embrace more progressive and collectivist values.

I examine two life-changing events that serve as information shocks to values: i) having a girl as the first child (conditional upon having a child, thereby instead of a boy), and ii) having been diagnosed with cancer. These events are characterized as exogenous, meaning that prior values do not influence their occurrence, and non-reversible meaning that once experienced, these events cannot be undone. I estimate the causal effects of these life events on values and social identity in an instrumental variable (IV) setting.[7]

Lastly, I consider a Simultaneous Equations Model (SEM), which offers less restrictive assumptions for identifying spillover effects. In this setting, values are determined both jointly and by their past values. The key identification assumption here is that one value is not directly influenced by the lagged value of the other, an assumption that aligns with my theoretical framework. Using the SEM enables the estimation and decomposition of changes in values attributable to the information shock (direct effect) and those resulting from spillover effects across values (indirect effect due to the change in social identity).

[5]The National Child Development Study (NCDS58) follows a cohort born in England, Scotland, and Wales during a single week in March 1958; the British Cohort Study (BCS70) includes individuals born during a specific week in April 1970. These datasets have been widely used in research on income and social mobility in the fields of Economics and Sociology. For examples, see Blanden et al. (2007), Goldthorpe and Jackson (2007), García-Peñalosa et al. (2023), among others.

[6]The first dimension encompasses conservation versus openness to change, representing a preference for stability, security, tradition, and conformity as opposed to openness to new experiences related to self-direction and stimulation. The second dimension captures self-transcendence versus self-enhancement, contrasting values related to care and concern for others, such as universalism and benevolence, with those focused on self-interest and ambition, associated with achievement and power.

[7]I also examine a third life event, 'having ever been unemployed,' which may be endogenous and thus unsuitable for causal analysis. Nevertheless, this scenario sheds light on the relationship between values, social identity, and the experience of unemployment.

The main result of this paper is to demonstrate the pivotal role of social identity in the dynamics of values and show the presence of spillover effects across values, both theoretically and empirically. Moreover, this paper presents three specific results related to life-changing events.

First, the birth of a daughter as the first child tends to increase conservatism among parents, without affecting their collectivism. This shift is reflected in political voting behavior; parents experiencing this event are more likely to support right-wing parties over left-wing parties in subsequent General Elections. The trend is consistent for both mothers and fathers, with a more pronounced effect observed in mothers. An analysis of heterogeneity by education level indicates that parents with tertiary education who have a daughter as their first child exhibit increased progressivism, suggesting a desire for greater gender equality for their daughters. In contrast, parents with primary or secondary education lean more towards conservatism, valuing societal authority more, possibly due to concerns about their daughters' exposure to societal challenges.

Second, a cancer diagnosis leads to an increase in both conservatism and collectivism, as well as a higher likelihood of voting for right-wing parties over left-wing parties in subsequent General Elections. This shift likely stems from an increased dependency on others, whether for financial or social support, prompting a greater community focus. Consequently, individuals tend to elevate their values associated with living in a community—emphasizing stability, tradition, and conformity within that community.

Third, experiencing unemployment is correlated with increased progressivism and collectivism. While I am unable to directly estimate the causal impact of unemployment on values due to the endogeneity of values, I have quantified the potential magnitude of bias this endogeneity might introduce. Although this bias could lessen the observed magnitude, it does not alter the direction of the change in values. Further analysis, segmented by current employment status (whether employed or unemployed), reveals no significant differences, suggesting that the effects of this life-changing event on values are enduring.

My work is related to several strands of the literature. My approach draws inspiration from the literature on identity in economics (Akerlof and Kranton 2005, 2010, Bénabou and Tirole 2011, Kranton 2016, Atkin et al. 2021, Oh 2023). Previous research has demonstrated the influence of group membership on individual behavior (Charness et al. 2007, Sutter 2009, Shayo 2020). I contribute to this body of work by establishing a link between changes in values and shifts in endogenous social identity. Consequently, individuals determine their preferred social group affiliation by comparing their personal values with those prevalent within these groups. In the empirical section, I develop my strategy for identifying shifts in social identity

through the lens of political identity (Greene 1999, Greene 2004, Shayo 2009, Bonomi et al. 2021, Bursztyn et al. 2019).

This paper establishes a new connection between the social psychology literature and economics. Psychological determinants of economic behaviors have primarily been introduced via personality traits (Borghans et al. 2008, Almlund et al. 2011, Ferguson et al. 2011, Becker et al. 2012, Flinn et al. 2018, Todd and Zhang 2020). The *big-five* personality traits, known for their stability throughout the life cycle, are limited in explaining variations in individuals' decision-making processes (Terracciano et al. 2006, 2010, Cobb-Clark and Schurer 2012). My work introduces motivational types of values *à la* Schwartz (1992, 2012) as novel predictors of economic behaviors. These values are more susceptible to change than personality traits due to the influence of life experiences (Lönnqvist et al. 2011, Daniel et al. 2021). Nonetheless, personality traits and values are interconnected, as they provide complementary perspectives on the same subject: the individual (Caprara et al. 2009, Fischer and Boer 2015, Parks-Leduc et al. 2015).

I contribute to three distinct additional bodies of literature with my results on the consequences of life-changing events. First, I contribute to the literature examining the impact of a child's gender on parental attitudes. Washington (2008) finds that congressmen exhibit more progressive voting behaviors after having daughters. In contrast, my research reveals that parents tend to adopt more conservative views when their first child is a girl. I demonstrate that these findings are not contradictory; tertiary-educated parents indeed become more progressive upon having a daughter. This distinction suggests that Washington (2008) primarily reflects the outcomes for highly educated individuals at the upper end of the socioeconomic spectrum, such as congressmen, while my study captures the broader average effect. Grinza et al. (2017) argue that entry into parenthood prompts women to adopt more conservative views.[8] My findings enrich this discussion by showing that this conservative shift is notably pronounced when the child is a daughter and that the change in values is more significant for mothers than for fathers.

Second, this paper contributes to the literature examining the impact of cancer on employment. Peteet (2000) explores the link between cancer and the significance of work, highlighting how the loss of occupational identity can lead to anxiety and depression. Moran et al. (2011) find that cancer survivors are employed at lower rates and work fewer hours compared to their peers, a disparity that may stem from altered life goals and work capacity limitations (Short et al. 2005, 2008a,b, Bradley et al. 2002, 2005, among others). My study builds upon this body of work by identifying a mechanism through which cancer affects employment out-

[8] In a similar vein, Bolzendahl and Myers (2004) and Cunningham et al. (2005) found that becoming parents diminishes support for gender egalitarianism within families.

comes, specifically through changes in values.

Third, my findings offer a new perspective on the literature concerning unemployment scarring by suggesting an alternative explanation for this phenomenon. Unemployment has well-documented effects on well-being and health (Clark and Oswald 1994, Knabe et al. 2010, Nordt et al. 2015). The concept of scarring has traditionally focused on the erosion of human capital and firm-specific skills as primary factors influencing future employment prospects (Arulampalam et al. 2001, Clark et al. 2001, Gregg and Tominey 2005). My research suggests that experiencing unemployment reduces individualism. Consequently, if the likelihood of securing employment is positively correlated with individualist values, then my analysis could introduce a novel mechanism by which previous unemployment episodes impact future job opportunities through alterations in values.

The remainder of the paper is organized as follows. Section 2 presents the theoretical framework, detailing the dynamics of values and social identity, along with the spillover effects across values. Section 3 outlines the cohort data, explains the derivation of values from attitudes, illustrates the mapping of political parties within a two-dimensional value space, and identifies the life events serving as information shocks for the empirical analysis. Section 4 examines the impact of life events on values, investigates changes in social identity corresponding to shifts in values, and demonstrates the presence of spillover effects through the use of instrumental variable regressions. Section 5 details a simultaneous equations model for identifying spillover effects where information shocks simultaneously influence multiple values and discusses the interplay between values in the context of social psychology literature. Section 6 provides concluding remarks.

2 Theoretical Framework

2.1 Single-value model

Consider an agent represented by one value, namely conservatism (as opposed to progressivism). Let $a_t \in \mathbb{R}$ denote the degree of conservatism of the agent at time t. By convention, the average value in the reference population is normalized to zero, that is, the norm.[9] Thus, $a_t > 0$ ($a_t < 0$) means that the agent has more conservative (progressive) values.

The agent identifies with a social group $s \in \{1,2\}$ composed of either conservatives (i.e.,

[9]The reference population can be defined at several levels, such as the city, the region, the country, or more broadly, the shared culture. See Roccas and Sagiv (2010) for the importance of the cultural context in the value–behavior relation. See also Bisin and Verdier (2011) for a survey on the economics of cultural transmission and Rapport (2014) for a survey on cultural heterogeneity in cultural anthropology.

$s = 1$) or progressives (i.e., $s = 2$).[10] The average degree of conservatism in both groups is, respectively, $\bar{a}_1 < 0$ and $\bar{a}_2 > 0$. I assume that the population is sufficiently large to ensure the *anonymity* of the agent, meaning that any change in the agent's degree of conservatism does not affect $\bar{a}_1 < 0$ nor $\bar{a}_2 > 0$.

In any period t, the agent solves the following maximization program to determine her conservatism and social identity:

$$\max_{a_t, s_t} U_t(a_t, s_t) = -\eta_a \frac{[a_t - a_{t-1}]^2}{2} - \phi_a \frac{[a_t - \bar{a}(s_t)]^2}{2}, \tag{1}$$

where $\bar{a}(s_t) = \{\bar{a}_1, \bar{a}_2\}$ is the average value a within her group s and $(\eta_a, \phi_a) \in (\mathbb{R}^{\star}_{+})^2$ are parameters that account for the relative importance of the time and group consistency.[11]

The agent seeks to minimize two psychological costs, namely, the *time inconsistency* and the *group dissonance*. The former refers to the agent's preference for consistency between her values today and those from the previous time period.[12] The latter psychological cost indicates that the agent prefers to align her values closely with the norm of the group with which she identifies.[13]

The optimal level of conservatism (given the social identity) is determined by balancing time consistency and group consistency, resulting in a weighted average of the agent's conservatism in the previous period and the average conservatism within her group. This balance is captured by the first-order condition from the maximization program (1), stated as follows:

$$a_t(s_t) = \frac{\eta_a a_{t-1} + \phi_a \bar{a}(s_t)}{\eta_a + \phi_a}. \tag{2}$$

Therefore, the agent's optimal conservatism is influenced by the group with which she chooses to identify.

Suppose identity is exogenous and the agent cannot identify with another group. Let her initial level of conservatism be a_0 and the average level of conservatism in her group be $\bar{a}$. The

[10] Although only two social groups are considered, the model can be extended to n groups; see Appendix A for more details on the extension to more than two groups.

[11] These parameters are assumed to be homogeneous within the population, although they might differ across groups of individuals. The emergence of heterogeneity in the relative importance of each component would be an interesting area for future research, which is left for further investigation.

[12] The literature on social psychology shows that individuals tend to resist changes in their attitudes, beliefs, and values through mental processes such as cognitive inertia or belief perseverance, providing empirical support for this component in the agent's utility; see Kunda (1990) for a review of biased information processing through which people maintain their beliefs.

[13] The desire to avoid group dissonance—reflecting conformity warp in the social economics literature—suggests that individuals deviate from their optimal behavior to conform to group norms; see Burke and Peyton Young (2011) for a survey on the influence of social norms on individual behaviors in the context of norms.

dynamics of the agent's conservatism, a_t, derived from Equation (2), are given given by:

$$a_t = \bar{a} + \left(\frac{\eta_a}{\eta_a + \phi_a}\right)^t (a_0 - \bar{a}). \tag{3}$$

It is straightforward to demonstrate that she converges towards the average conservatism of the group, i.e., $\lim_{t\to+\infty} a_t = \bar{a}$, at a convergence rate:

$$\mu \equiv \lim_{t\to+\infty} \frac{|a_{t+1} - \bar{a}|}{|a_t - \bar{a}|} = \frac{\eta_a}{\eta_a + \phi_a} < 1.$$

This leads to Proposition 1. The proof is provided in Appendix A.

Proposition 1 (Value Convergence) *For any individual in group s, $\lim_{t\to+\infty} a_t = \bar{a}(s)$, and the speed of convergence is positively dependent on the relative weight of the group consistency (with respect to the time consistency), i.e., $\partial\mu/\partial(\phi_a/\eta_a) > 0$.*

Suppose the agent can now freely choose her social identity.[14] She compares her indirect utilities from both groups to determine her preferred group. The agent weakly prefers her current group to the other as long as her indirect utility in this group is greater than or equal to that in the other group. Using the utility function from the maximization problem defined in Equation (1) and the optimal level of conservatism from Equation (2), I obtain

$$U_t(2) - U_t(1) = -\gamma_a \left([\bar{a}_2 - a_{t-1}]^2 - [a_{t-1} - \bar{a}_1]^2 \right), \tag{4}$$

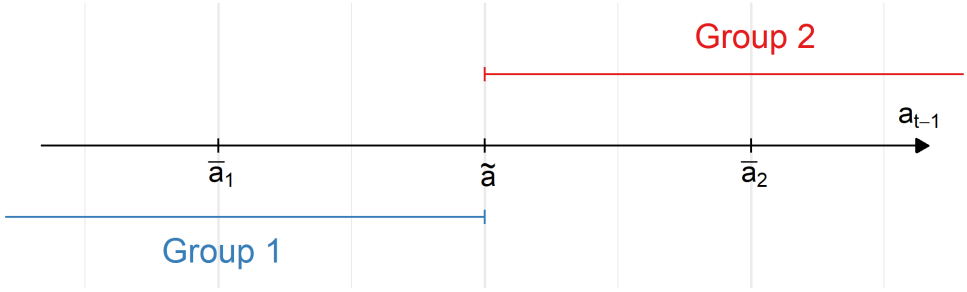
where $\gamma_a \equiv \frac{\eta_a \phi_a}{2(\eta_a + \phi_a)} > 0$.

Let $\tilde{a}$ denote the *indifference value*, defined as the threshold value at time $t-1$ such that the agent is indifferent between both social identities in period t, i.e., $U_t(2) - U_t(1) = 0$. Using Equation (4), the indifference value is $\tilde{a} = \hat{a}$, where $\hat{a} \equiv (\bar{a}_1 + \bar{a}_2)/2$ is the *midpoint value*. The midpoint value represents the halfway mark between the average values of both groups and signifies the boundary between the two social identities. The agent's anonymity ensures that this boundary is exogenously determined.

Figure 1 illustrates the concept of indifference value and social identity in the single-value model. In the single-value model, the agent's preference for belonging to either group 1 or 2 is dictated by whether her previous period's value, a_{t-1}, is lower or greater than the midpoint value, $\hat{a}$. Without any shocks affecting her level of conservatism, the agent tends toward

[14] The model does not account for any uncertainty in the ability to identify with a group or any direct costs associated with such identification. Nevertheless, group consistency reflects the psychological, and thus indirect, cost of changing groups.

Figure 1: Indifference Values and Social Identity in the Single-Value Model



Notes: This figure depicts the indifference value $\tilde{a}_{t-1}$, defined as the threshold value a at time $t-1$ making the agent indifferent between the two groups. In the single-value model, this corresponds to the midpoint value $\hat{a}$, the average of the two groups' average values. If the agent's value a in the previous period is lower (greater) than $\tilde{a}$, she prefers to identify with group 1 (group 2).

a steady-state conservatism aligned with her group's average conservatism, as described by Equation (3). Yet, what happens when there is a shock?

If an information shock, such as a significant life event, which will be discussed later in this paper, is sufficiently large, it may lead the agent to identify with the other group.[15] Suppose the agent identifies with group 1 in period $t-1$, that is, with the progressives, and experiences a shock $\Delta a_{t-1} > 0$ at the end of that period, resulting in her conservatism being adjusted to $a'_{t-1} \equiv a_{t-1} + \Delta a_{t-1}$. If this shock pushes her conservatism beyond the indifference value, which is characterized by the midpoint value, i.e., $a'_{t-1} > \tilde{a}$, she now prefers to identify with group 2, namely, the conservatives.

This leads to Proposition 2. For any agent, there always exists an information shock such that she prefers to identify with the other group. Proof in Appendix A.

Proposition 2 (Shock Existence) *For any individual,* $\exists \Delta a_{t-1}$ *such that* $|\Delta a_{t-1}| > |\tilde{a}_{t-1} - a_{t-1}|$ *and* $U_t(s_t) > U_t(s_{t-1})$ *with* $s_t \neq s_{t-1}$.

To summarize, the single-value model yields two main results. First, any individual converges to the average value within her group in the long run. The time required for convergence is influenced by two factors: the rate of convergence and the distance from the group-average value. On the one hand, a higher ratio of η_a/ϕ_a increases the psychological cost of time inconsistency relative to group dissonance, thus accelerating convergence. On the other hand, a greater initial deviation from the group-average value extends the time to convergence.

Second, it is always possible to find a shock that causes an individual to start identifying with the opposite group. Such a shock must satisfy two criteria: its direction must be towards

[15] According to constructivist psychology, a shock to values entails an event that exposes the agent to new information through an experience (Levitt et al. 2004). This event challenges the agent by questioning her sense of independence, her emotions, and her self-awareness, thereby affecting all her perceptions of the meaning of life (i.e., values).

the average value of the other group, and its magnitude must be large enough. The required magnitude of the shock depends on the value distance between the two groups and the individual's current value. The larger the value distance, the stronger the shock must be. When the individual's current value is at a steady state, the necessary shock magnitude is determined by the midpoint distance. Conversely, the closer the agent's current value is to the midpoint value, the smaller the required shock.

2.2 Two-value model

To explore the dynamics in scenarios where two values are considered instead of one, I consider an agent characterized by two values. Let $a_t \in \mathbb{R}$ represent conservatism, as opposed to progressivism, akin to the single-value model, and let $b_t \in \mathbb{R}$ denote collectivism, in contrast to individualism. The utility function retains an additively separable structure but now incorporates collectivism alongside conservatism. The agent's maximization program is redefined as:

$$\begin{aligned}\max_{a_t,b_t,s_t} U_t(a_t,b_t,s_t) = &-\eta_a \frac{\left[a_t - a_{t-1}\right]^2}{2} - \phi_a \frac{\left[a_t - \bar{a}(s_t)\right]^2}{2} \\ &-\eta_b \frac{\left[b_t - b_{t-1}\right]^2}{2} - \phi_b \frac{\left[b_t - \bar{b}(s_t)\right]^2}{2},\end{aligned} \tag{5}$$

where $\bar{a}(s_t) = \{\bar{a}_1, \bar{a}_2\}$ and $\bar{b}(s_t) = \{\bar{b}_1, \bar{b}_2\}$ are the group averages for conservatism and collectivism, respectively, and $(\eta_a, \phi_a, \eta_b, \phi_b) \in (\mathbb{R}_+^\star)^4$ are parameters indicating the relative importance of each component of the utility function.

The agent seeks to mitigate the same psychological costs as before, namely, time inconsistency and group dissonance, but now across two values instead of one. The optimal values (conditional on the group) remain analogous to those in the single-value model, equating to the weighted average between the agent's past value and the group's average value:

$$a_t(s_t) = \frac{\eta_a a_{t-1} + \phi_a \bar{a}(s_t)}{\eta_a + \phi_a}, \qquad \text{and} \qquad b_t(s_t) = \frac{\eta_b b_{t-1} + \phi_b \bar{b}(s_t)}{\eta_b + \phi_b}.$$

Consequently, the dynamics of the values mirror those described by Equation (3), and Proposition 1 remains applicable. Despite the introduction of an additional value, the fundamental characteristics relative to the single-value model do not change.

The distinction in the model arises from the *interdependence* between the two values, conservatism and collectivism. There are still two groups, labeled 1 and 2, with their average values respectively denoted by $(\bar{a}_1, \bar{b}_1)$ and $(\bar{a}_2, \bar{b}_2)$. Given that values are standardized across

the population, this standardization implies that $\bar{a}_1$ and $\bar{a}_2$ possess opposite signs, as do $\bar{b}_1$ and $\bar{b}_2$. By convention, the average value of a in both groups is set such that $\bar{a}_1 < 0 < \bar{a}_2$, indicating that the first group is more progressive, while the second group leans more towards conservatism.

The interdependence between the two values is reflected through the sign of $\bar{b}_2$ (or equivalently, $\bar{b}_1$). If $\bar{b}_2 > 0$, it indicates a positive correlation between conservatism and collectivism within the population. Reciprocally, this implies a correlation between progressivism and individualism as well. Otherwise, if $\bar{b}_2 < 0$, there is a negative correlation between conservatism and collectivism, implying that conservatives tend to be individualists, while progressives are more likely to be collectivists. This correlation between values across groups plays a critical role in influencing the agent's indifference values, which are pivotal in her decision to identify with one group over the other.

Let $(\tilde{a}, \tilde{b})$ denote the indifference values at which the agent is indifferent between both groups, i.e., $U_t(2) - U_t(1) = 0$. Solving this equation reveals the relationship between the two indifference values:

$$\tilde{a} = \hat{a} - \frac{1}{\gamma} \frac{\bar{b}_2 - \bar{b}_1}{\bar{a}_2 - \bar{a}_1} \left(\tilde{b} - \hat{b} \right), \tag{6}$$

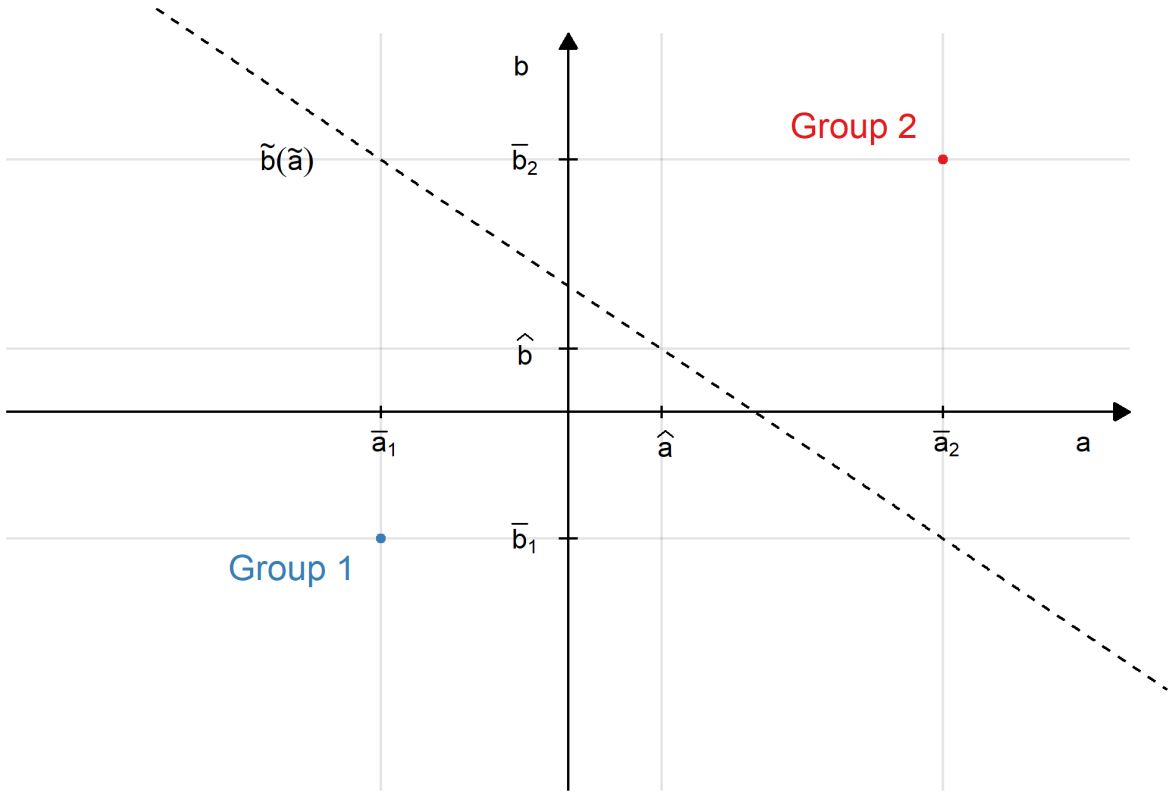
where $\gamma \equiv \gamma_a / \gamma_b > 0$ and $\bar{a}_2 - \bar{a}_1 > 0$ by definition. When both values are orthogonal, i.e. $\bar{b}_2 - \bar{b}_1 = 0$, the indifference value $\tilde{a}$ reverts to that of the single-value model, namely, the midpoint value $\tilde{a} = \hat{a}$.

Figure 2 presents the relationship between the indifference values derived from Equation (6) within the two-dimensional space. For the sake of simplicity, I assume that both values are positively correlated across groups, implying $\bar{b}_2 - \bar{b}_1 > 0$. The results would be symmetrical if the values were negatively correlated. The dashed line depicts the set of indifference values, guiding the agent's choice of social identity between the two groups. Agents positioned to the left (right) of this line exhibit a preference for identifying with group 1 (group 2) and will, over time, converge towards the average values of their chosen group.

The interdependence between values introduces a distortion to the indifference value, influenced by the polarization of both groups within the two-dimensional space. To illustrate this, consider an agent from group 1 in her steady state, with $a_{t-1} = \bar{a}_1$ and $b_{t-1} = \bar{b}_1$. An information shock affects her value a at the end of period $t-1$, resulting in $a'_{t-1} = \bar{a}_1 + \Delta a_{t-1}$. In period t, the agent must decide whether to continue identifying with her current group or switch to the other group, with her optimal values contingent upon this decision. If she chooses to remain with her current group, her indirect utility is given by:

$$U_t(1) = -\gamma_a \left(\Delta a_{t-1} \right)^2. \tag{7}$$

Figure 2: Indifference Values and Social Identity in the Two-Value Model



Notes: This figure displays the set of values (represented by the dashed line) at which the agent is indifferent between identifying with either group. The x-axis represents conservatism, and the y-axis represents collectivism. The points $(\bar{a}_1, \bar{b}_1)$ and $(\bar{a}_2, \bar{b}_2)$ correspond to the average values within groups 1 and 2, respectively. An agent located to the left (right) side of the dashed line identifies with group 1 (group 2).

Conversely, if she chooses to identify with the other group, her indirect utility becomes:

$$U_t(2) = -\gamma_a \left[\bar{a}_2 - \bar{a}_1 - \Delta a_{t-1}\right]^2 - \gamma_b \left[\bar{b}_2 - \bar{b}_1\right]^2. \tag{8}$$

The agent decides to change her group *if and only if* the information shock shifts her value a'_{t-1} beyond the indifference threshold $\tilde{a}$. In this example, the indifference threshold is determined using Equations (7) and (8), yielding:

$$\tilde{a} = \hat{a} + \frac{1}{2\gamma} \frac{\left(\bar{b}_2 - \bar{b}_1\right)^2}{\bar{a}_2 - \bar{a}_1}. \tag{9}$$

This equation shows that the conservatism making the agent indifferent between the two groups is affected by the degree of interdependence, reflecting the polarization in collectivism relative to conservatism between the groups. Equation (9) defines the indifference value $\tilde{a}$ as a

deviation from the midpoint value observed in the single-value model. This deviation results from the level of interdependence between values; the larger the disparity $\bar{b}_2 - \bar{b}_1$ relative to $\bar{a}_2 - \bar{a}_1$, the more significant the distortion.

Proposition 2 holds when incorporating an additional interdependent value, such as collectivism, indicating that it is always possible to identify a sufficiently large shock that leads the agent to prefer identifying with the alternate group.

The inclusion of an interdependent value gives rise to Proposition 3. Proof in Appendix A.

Proposition 3 (Value Relevance) *If a value poorly discriminates groups, relative to another value, becomes less significant in an individual's choice of social identity.*

When the discrepancy in average collectivism between groups is significantly large, i.e., $|\bar{b}_2 - \bar{b}_1| \gg \bar{a}_2 - \bar{a}_1$, it suggests that polarization in collectivism outweighs conservatism in defining group distinctions. Consequently, conservatism becomes a less determinative factor in the agent's social identity choice than collectivism. In such cases, only a substantial shock in conservatism is likely to induce the agent to switch groups. This is attributed to the overwhelming psychological cost associated with group dissonance in collectivism, which is not easily compensated by factors other than alignment with the current group identity—unless influenced by a significant information shock.

2.3 Predictions of the model

The theoretical framework describes the dynamics of interdependent values and social identity, yielding several predictions.

Proposition 1 suggests that, in the absence of information shocks, any agent's values will converge towards those of her group.

Proposition 2 shows that for any agent, a sufficiently large information shock can always be found, compelling the agent to identify with the opposite group. A corollary to this proposition acknowledges that smaller shocks may only have a temporary effect, as they do not lead to a change in group identification, hence social identity.

Propositions 1 and 2 remain applicable when the agent embodies two values that exhibit correlation—hence are interdependent—across groups.

Proposition 3 posits that the values which most distinctly separate the groups become pivotal in an individual's choice of social identity.

The theoretical framework highlights a critical issue: the inadequacy of considering only a single value at a time. The trade-off in the agent's identity consistency is significantly influenced by the degree of interdependence between values across groups. Consequently, overlooking this interdependence may lead to an underappreciation of the group's influence on

value dynamics. Therefore, the more pronounced the correlation of values across groups, the more substantial the shock required for an agent to identify with a new group.

Furthermore, I derive Proposition 4 that states the existence of spillover effects across values. Proof in Appendix A.

Proposition 4 (Spillover Effect) *Given* $\bar{v_1} - \bar{v_2} \neq 0 \; \forall v = \{a, b\}$*, for any individual,* $\exists \Delta a_{t-1}$ *such that* $|\Delta a_{t-1}| > |\tilde{a}_{t-1} - a_{t-1}|$ *and* $U_t(s_t) > U_t(s_{t-1})$*, with* $s_t \neq s_{t-1}$*, which implies that* $\lim_{t \to +\infty} v_t = \bar{v}(s_t)$.

The interpretation of the proposition is as follows: When two values are interdependent, there is invariably an information shock on one value—consider conservatism, for instance—that can be sufficiently large to prompt the agent to achieve a higher level of utility by identifying with the other group in the subsequent period. Consequently, both values converge towards the average values of that new group over the long term.

In scenarios where an information shock—stemming from a life-changing event, for example—affects conservatism significantly, the individual will identify with a different group, thereby altering both of her values. Even though the second value, such as collectivism, may not be directly impacted by the shock, the life-changing event indirectly influences this value as well, through the spillover effect.

3 Data

3.1 Sample

I use two mature British cohort studies: the National Child Development Study (NCDS58), comprising individuals born in the same week of March 1958, and the British Cohort Study (BCS70), which includes those born in the same week of April 1970.[16] Members of these cohorts were born in England, Scotland, and Wales.

Participants from both cohorts underwent several interviews at different life stages. I categorize four life stages according to the decades: twenties, thirties, forties, and fifties. For the BCS70 cohort, period 1 corresponds to the interview at age 26, period 2 to the interview at age 30, and period 3 to the interview at age 42. For the NCDS58 cohort, the periods begin with period 2 for the interview at age 33, followed by period 3 at age 42, and period 4 at age 50.

One of the main challenges with cohort studies is attrition, as cohort members may not participate in every interview. Consequently, some individuals are missing from certain in-

[16] These cohort data have been widely used in research related to income and social mobility in Economics and Sociology; see, for example, Blanden et al. (2007), Goldthorpe and Jackson (2007), García-Peñalosa et al. (2023), among others.

Table 1: Number of Cohort Members and Response Rates by Periods

	BCS70	NCDS58
Initial	19,006 (100%)	17,885 (100%)
Period 1	9,003 (47.4%)	
Period 2	11,261 (59.2%)	11,469 (64.1%)
Period 3	9,841 (51.8%)	11,419 (63.8%)
Period 4		9,790 (54.7%)
All	6,115 (32.2%)	8,107 (45.3%)

Notes: Response rates are shown in parentheses. The last row indicates the number of cohort members who have participated in all periods.

terviews or are lost from the study altogether. Table 1 displays the response rates by period. Period 2 exhibits the highest response rate, with 64.1% for the NCDS58 cohort and 59.2% for the BCS70 cohort. Notably, the interview for BCS70 cohort members at age 30, which corresponds to Period 2, was conducted simultaneously with the Period 3 interview for NCDS58 cohort members at age 42, both occurring in the year 2000.

3.2 Conservatism and Collectivism

From these interviews, I derive values based on individuals' responses to various statements about their attitudes.[17] During each interview, cohort members respond to statements using a 5-level scale: strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree. I assign them a score for each statement ranging from -2 to 2, corresponding to their chosen response.

These statements encompass five attitudes (listed alphabetically): Authority (A), Inequality Aversion (IA), Morale (MOR), Political Cynicism (PC), and Work Ethic (WE).[18] Below are some examples of the statements corresponding to these attitudes:[19]

For each individual, I calculate her standardized score for each of the five attitudes across every period, following a two-step process. I start by determining the average score within each attitude category (A, IA, MOR, PC, WE) for every individual at each period. Thus, each individual receives a specific score for each attitude in every period. Then, I standardize these

[17] In social psychology, an attitude towards an object—such as a statement—encompasses emotions, beliefs, and behaviors directed at that particular object.

[18] These five attitudes were selected because they are consistently available across all interviews for both cohorts. The number of statements varies by cohort and period, and the cohorts do not necessarily have the same set of statements. An exception is when the BCS70 cohort is at age 30 and the NCDS58 cohort is at age 42, as the interviews had identical questionnaires in 2000. See Table B.1 in Appendix B for detailed information on the availability of statements at each interview.

[19] A comprehensive list of statements is available in Tables B.2 to B.4 in Appendix B.

(A2) *For some crimes the death penalty is the most appropriate sentence*

(IA6) *Government should redistribute income from the better off to those who are less well off*

(MOR3) *Couples who have children should not separate*

(PC1) *None of the political parties would do anything to benefit me*

(WE1) *Having almost any job is better than being unemployed*

scores at both the cohort and period levels, enabling adjustment for macro events that could shift the entire distribution of attitudes. Through this standardization process, each individual is aligned with her cohort and, for each period, possesses a standardized score in each attitude that is comparative to the cohort norm for that specific period.

Conservatism and collectivism scores are derived from these attitude scores using Principal Component Analysis (PCA). PCA enhances the interpretability of the data while minimizing information loss. By concentrating on the first two components, which are orthogonal due to PCA's construction, these can be understood as the principal values distinguishing individuals' attitudes.

Subsequent principal components serve, to some extent, as residuals. While they could potentially be included in the analysis, Proposition 3 underscores that for a value to significantly impact social identity, it must effectively differentiate between groups. The first two principal components alone account for over 50% of the variance explained in attitudes (refer to Figure 3), diminishing the importance of the discriminatory capability of the remaining components.

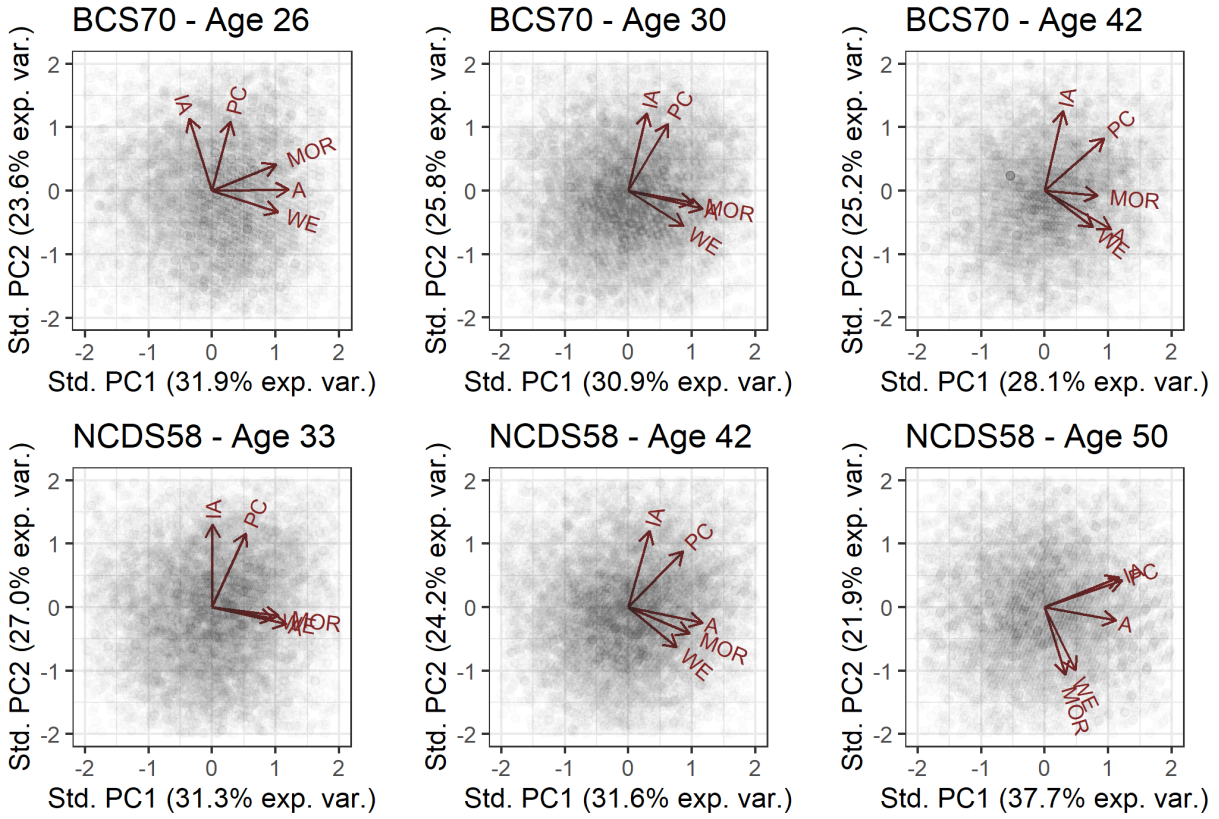
PCA is conducted at both the cohort and period levels. Figure 3 shows the eigenvectors for the first two principal components. The relationship among attitudes appears to be relatively consistent across cohorts and periods. These first two principal components account for over 50% of the variance in attitudes, demonstrating their substantial explanatory power.

I interpret the two dimensions as representing conservatism, contrasted with progressivism, and collectivism, set against individualism.[20]

The direction of vectors along the x-axis reveals attitudes emblematic of conservatism, which embodies a preference for stability, security, tradition, and conformity. In the data, these are manifested through attitudes towards Authority (A), Morale (MOR), and Work Ethic (WE). Conservatism (as opposed to progressivism) is the primary dimension differentiating

[20]These dimensions align with the two-dimensional structure of universal motivational types of values, as delineated by Schwartz in his foundational work (Schwartz (1992), Schwartz (2012))—refer to Figure C.1 in Appendix C. In Schwartz (1992), these dimensions are termed conservation (versus openness to change) and self-transcendence (versus self-enhancement), respectively.

Figure 3: Eigenvectors of the First Two Principal Components



Notes: This figure displays the eigenvectors of the first two principal components, with each panel representing a cohort and their age at the interview. The x-axis (Std. PC1) denotes the first principal component, while the y-axis (Std. PC2) refers to the second principal component. Faded points represent individual cohort members in this two-dimensional space. Further details on the eigenvectors are provided in Tables C.1 and C.2 for the BCS70 and NCDS58 cohorts, respectively. The attitudes are Authority (A), Inequality Aversion (IA), Morale (MOR), Political Cynicism (PC), and Work Ethic (WE).

individuals.

The y-axis vector directions highlight attitudes indicative of collectivism, emphasizing care and concern for others, aligned with universalism and benevolence. This dimension is represented in the data by attitudes towards Inequality Aversion (IA), Political Cynicism (PC), and Work Ethic (WE), pinpointing collectivism (as opposed to individualism) as the secondary, yet significant, discriminatory dimension among individuals.

Cohort members are assigned a Conservatism score ($Cons$) and a Collectivism score ($Coll$) for each period. These scores are calculated through a projection of the first two principal components based on attitudes across all individuals in each period. By design, both scores are standardized at the cohort-period level and are orthogonal as a result of the PCA process.

The inherent orthogonality between Conservatism and Collectivism scores—achieved by construction—ensures that one score cannot explain the variation in the other. Consequently,

any observed spillover effect across values, as stated in Propositon 4, must be mediated through an intermediary, such as social identity, rather than occurring directly.

3.3 Groups Mapping using Political Vote at General Elections

Defining social groups is crucial for understanding the dynamics of values and social identity. Thus far, a group can be interpreted as comprising peers with whom the agent identifies in terms of values. One might consider these peers to be close individuals, such as relatives, neighbors, or colleagues, because we tend to share values with them. However, individuals often cannot easily sever all ties with these individuals due to direct costs. These direct costs obstruct the identification of changes in group membership by introducing noise through bonds. Therefore, I cannot rely solely on peers to define groups.

An alternative proxy for social identity is political voting behavior, as the latter is often determined by the former (Bonomi et al. 2021, Gethin et al. 2021). There is no direct cost associated with voting for one party over another in a General Election, conditional upon voting. Furthermore, political parties reflect aspects of individuals' values in that the agent decides to identify with one party over others when voting.

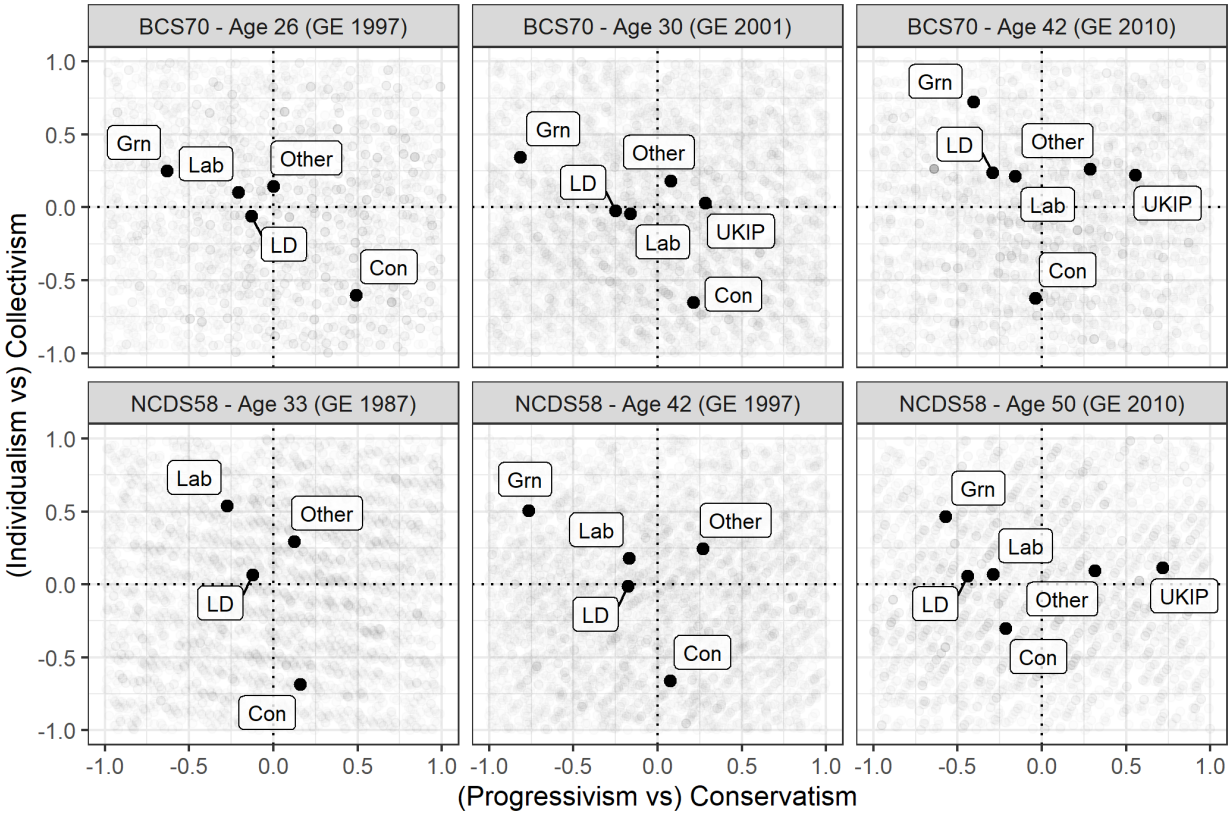
Figure 4 presents a mapping of the values of average voters for each main political party in the UK at the most recent General Election (GE); see Table D.1 in Appendix D for the vote shares in both cohorts. This figure illustrates the relationship between voting behavior and values for these cohorts, as well as the positioning of the voter bases of UK political parties.

1987 General Election. The bottom-left panel represents the mapping of values in the 1987 General Election, during which only the NCDS58 cohort voted at age 33. The positioning of the two main UK political parties is consistent: Labour voters are characterized as progressive and collectivist, whereas Conservative voters are seen as conservative and individualist. The Liberal Democrats serve as an intermediary between the Labour and Conservative parties.[21] The category 'Other' encompasses all other parties, blank votes, and abstentions.

1997 General Election. The top-left and bottom-middle panels correspond to the 1997 General Election, during which the Green Party emerged and attracted voters with progressive and collectivist values. The overall structure of values and voting patterns remains stable across cohorts.

[21] Note that the Liberal Democrats party was officially formed in 1988 through the merger of the SDP–Liberal Alliance, which participated in the 1987 General Election. For simplicity, this discussion refers to the SDP–Liberal Alliance in 1987 as the Liberal Democrats.

Figure 4: Average Values According to Political Vote



Notes: This figure presents the mapping of average scores in conservatism and collectivism according to political voting in General Elections (GE). Political parties are (in alphabetical order): Conservative (Con), Green (Grn), Labour (Lab), Liberal Democrat (LD), and UK Independence Party (UKIP). Other encompasses all other parties, blank votes, and abstentions.

2001 General Election. The top-middle panel shows the rise of the far-right party, UKIP, in the 2001 General Election. Given that the formation of political parties is endogenous, it is not surprising that UKIP emerged in a space previously lacking political representation, closely aligning with the 'Other' category, which includes smaller parties and abstentions.

2010 General Election. Both right panels display the political landscape of the 2010 General Election. The political preferences of the BCS70 cohort exhibit a wider distribution along the collectivism axis, whereas those of the older cohort show a broader spread on the conservatism axis. This disparity may also signify generational differences in value relevance, with the conservatism dimension holding more significance for the Boomer generation (as represented by the NCDS58), and the collectivism dimension being more pertinent to Generation X (as represented by the BCS70).

The relative positions of the political parties to one another remain consistent over time

and across cohorts within the two-dimensional values space. Therefore, I consider the political voting behavior of individuals as a significant proxy for their social identity in the remainder of the empirical analysis. This proxy helps in understanding how individuals begin to identify with other social groups following significant life events.

3.4 Life-Changing Events

I am interested in life-changing events that produce information shocks affecting the dynamics of values and social identity. The ideal scenario for establishing causality would involve an exogenous, irreversible life-changing event that generates an information shock on *only one* value, such as conservatism, without directly impacting collectivism.

The life events that must be considered require two properties: *exogeneity* and *non-reversibility*. Firstly, the life event must be exogenous, ensuring that values from the previous period do not influence the likelihood of the life event occurring. Secondly, the life event must be non-reversible to avoid the potential endogeneity of reversing the event, which could bias the estimation of an individual's values at the time of interviews.[22]

In this regard, I focus on two life events that satisfy both properties: *having ever had cancer* and *having a girl as a first child, conditional on having a baby.*

Having ever had cancer. The first life event, having ever had cancer, is exogenous in that neither conservatism nor collectivism influences the likelihood of contracting cancer—excluding individuals with lung cancer, as smoking behavior could be associated with values. It is also non-reversible, as the comparison is between individuals who have *ever* had cancer and those who have never had it. The focus is on the information shock resulting from the awareness of having cancer, rather than the illness *per se*, as one might have it without knowing or might recover from it.[23]

Having a girl as a first child. For the second life event, I focus on a subset comprising individuals who have at least one child, comparing those who had a girl as their first child with

[22] It is worth noting that life events causing temporary shocks are also of interest, particularly if such a shock leads to a change in social identity. In the absence of a reverse shock, both temporal and group consistencies would hinder the individual from reverting to their previous group's values. Thus, a sufficiently large temporary shock can have long-term implications for an individual's values.

[23] It should be noted that for the older cohort at age 50, there may be a bias in considering the effect of this life event on values. As individuals reach 50, they might expect their health to deteriorate in the coming years, possibly anticipating such a life event and adjusting their values accordingly. This anticipation could bias the estimate toward zero, as the control group—those who have not yet experienced cancer—might shift their values in anticipation, similar to those who have been diagnosed. Hence, for this cohort at this age, the approach is likely to yield a conservative estimate of the impact of having ever had cancer on values.

those who had a boy. This life event is exogenous to values, as the probabilities of a child's sex at birth are approximately fifty-fifty, given that sex-selective abortion is exceedingly rare in the UK.[24] Once the child is born, the event is non-reversible, as it has occurred and is permanent. I also exclude adopted children from the analysis because the child's sex may be chosen by the parents, thereby potentially reflecting their values and preferences (Dahl and Moretti 2008). Additionally, stillborn babies are excluded, as the opportunity for parents to socialize with the child is absent.[25]

I only focus on the first child as fertility decisions for following children might be linked to the sex of the eldest child and values, e.g. a preference for diversity in children's birth sex. Moreover, some parents may have a boy as their first child and a girl thereafter. Some changes in values may be specific to having a girl even though she is not the first baby. Thus, this is likely to produce a lower-bound estimate and also to reduce the statistical power of effects of this life event on values.

Having ever been unemployed. Lastly, I examine the impact of unemployment on values, as it represents a significant informational shock in individuals' lives. However, unemployment cannot be classified as a life event to derive causality because it fails to meet both required properties. Firstly, individuals often change their employment status, thereby continuously altering the effect of unemployment on values due to these changes. Secondly, the likelihood of being unemployed is endogenous to values such as conservatism and collectivism. For example, it could be posited that individuals with a strong work ethic, indicative of high conservatism and individualism, are less likely to be unemployed, as they are more reluctant to leave their jobs compared to those with a lower work ethic.

This life-changing event is included in the analysis to provide insights into the relationship between values, social identity, and unemployment within the empirical framework. However, any conclusions drawn from this aspect of the study should be approached with caution, as it is not possible to assert a causal relationship.

3.5 Variables and Summary Statistics

For the analysis, I consider three life events: having a girl as the first child, having ever been diagnosed with cancer, and having ever experienced unemployment. $GirlFirst$ is a dummy

[24] Dubuc and Coleman (2007) suggest that sex-selective abortion occurs among mothers born in India and residing in Great Britain. They demonstrate that sex ratios at birth for Asian groups in England and Wales have been slightly lower before 1990. While this phenomenon presents various social and economic implications, it does not statistically impact my findings, as these cases constitute a minority in the dataset.

[25] It is worth noting that this tragic event could itself be considered a significant life event with a profound impact on parents' values.

variable that is assigned a value of one if the first child's sex is female, and zero if male. $GotCancer$ is another dummy variable, taking the value of one if the individual has been diagnosed with cancer by the time of the interview. Similarly, $BeenUnemp$ is a dummy variable that equals one if the individual has experienced unemployment for at least one month by the time of the interview.[26]

I consider several socioeconomic characteristics as control variables in the analysis. Among these, I consider the sex at birth of the cohort members and their level of education, based on the highest academic qualification they have obtained. $Female$ is a dummy variable that is assigned a value of one if the cohort member was born female. Education levels are grouped into three categories representing primary, secondary, and tertiary education levels ($Educ$). Both control variables are significant determinants of values and social identity, such as conservatism and collectivism, and play a crucial role in understanding their dynamics in relation to life-changing events.

Table 2 presents the descriptive statistics for the NCDS58 and BCS70 cohorts, which contain 30,552 and 27,906 observations, respectively. Each cohort is observed over three periods, corresponding to three decades, with approximately a third of the observations in each decade. About half of the sample is female. The younger cohort (BCS70) tends to be more educated than the older cohort (NCDS58), with 20% of observations in the NCDS58 cohort having tertiary education, compared to 29% in the BCS70 cohort.

The table also provides summary statistics on the share of cohort members who experienced the specified life-changing events. The occurrence of having a girl as the first child is conditional on having a baby, leading to more NA (Not Applicable) values in the BCS70 cohort, indicating a greater number of observations that do not meet the condition of having a baby. This discrepancy is due to several factors. Firstly, the interview ages for the BCS70 cohort are 26, 30, and 42, which are younger compared to the NCDS58 cohort's interview ages of 33, 42, and 50, making it more likely for the former to not have children by the first interviews. Secondly, fertility rates have declined between the two cohorts. Among those who had a baby, approximately half had a girl, and the other half had a boy.

The incidence of having ever had cancer is a rare life event, affecting only 3% of the NCDS58 cohort and 1% of the BCS70 cohort. This difference is also explained by the varying interview ages between the cohorts. Lastly, experiencing unemployment at least once occurred in 34% of the NCDS58 cohort and 21% of the BCS70 cohort.

[26] Activity status is derived from the complete activity histories to the nearest month since cohort members turned 16 years old. These data are accessible for all cohort members up to the most recent interview in which they participated. For individuals absent in previous interviews, interviewers inquired about their activities during the missed period.

Table 2: Summary Statistics

	NCDS58 - N = 30,552					BCS70 - N = 27,906				
Variable	Mean	SD	Min	Max	NA	Mean	SD	Min	Max	NA
Period 1 - Twenties						0.31	0.46	0	1	0
Period 2 - Thirties	0.35	0.48	0	1	0	0.40	0.49	0	1	0
Period 3 - Forties	0.37	0.48	0	1	0	0.29	0.45	0	1	0
Period 4 - Fifties	0.28	0.45	0	1	0					
Female	0.51	0.50	0	1	0	0.53	0.50	0	1	0
Education - Primary	0.62	0.49	0	1	0	0.52	0.50	0	1	0
Education - Secondary	0.19	0.39	0	1	0	0.19	0.39	0	1	0
Education - Tertiary	0.20	0.40	0	1	0	0.29	0.46	0	1	0
Girl First	0.49	0.50	0	1	7199	0.48	0.50	0	1	14789
Got Cancer	0.03	0.16	0	1	0	0.01	0.12	0	1	0
Been Unemployed	0.34	0.48	0	1	0	0.21	0.41	0	1	0

Notes: This table provides descriptive statistics of the variables used in the study. Values and attitudes are not included in this table as they are standardized. Period variables are dummy variables indicating the decade in which individuals are interviewed. Female is a dummy variable assigned a value of one if the cohort member's sex at birth is female. Education variables are categorized as dummy variables for primary, secondary, and tertiary education levels. GirlFirst is a dummy variable that is assigned a value of one if the first child's sex is female, and zero if male. GotCancer is a dummy variable indicating whether an individual has ever had cancer by the time of the interview. BeenUnemp is a dummy variable indicating whether an individual has ever been unemployed for at least one month by the time of the interview.

4 Empirical Evidence

4.1 Direct Effect of Life Events on Values

I estimate *independently* with OLS the effect of the life event $z \in Z = \{GirlFirst, GotCancer, BeenUnemp\}$ on value $v \in V = \{Cons, Coll\}$ for an individual i in period t with the following equation:

$$v_{it} = \alpha + \beta z_{it} + \eta v_{i,t-1} + X_i \delta + u_{it} \tag{10}$$

where X is a set of control variables including gender, education level, and period and cohort fixed effects.

The coefficients of interest are β and η. The former coefficient, β, indicates the direct impact of the life event on the value (either conservatism or collectivism) as it compares individuals for whom the life event occurred with those for whom it did not. The latter coefficient, η, measures the time consistency of individuals, as today's values for an individual are likely to be close to those of yesterday. Table 3 summarizes both coefficients (see Table E.1 in Appendix E for all the coefficients).

Both exogenous life events, $GirlFirst$ and $GotCancer$, lead to individuals becoming more

Table 3: Effect of Life Events on Values

	Linear regression - OLS					
	GirlFirst		GotCancer		BeenUnemp	
	(Cons)	(Coll)	(Cons)	(Coll)	(Cons)	(Coll)
Life event	0.03^{**}	0.00	0.09^{***}	0.02	0.02^{*}	0.18^{***}
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)
Value_{t-1}	0.54^{***}	0.49^{***}	0.56^{***}	0.50^{***}	0.56^{***}	0.49^{***}
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.37	0.26	0.39	0.27	0.39	0.27
Adj. R^2	0.37	0.26	0.39	0.27	0.39	0.27
Num. obs.	23354	23354	32885	32885	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables include gender, education (primary, secondary, tertiary), and cohort and period fixed effects. Male in the NCDS58 cohort in his forties with primary education as the reference group. GirlFirst, GotCancer, and BeenUnemp are the life events. In GirlFirst regressions, parents who have had a boy as a first child are the reference group. In GotCancer regressions, individuals who never had cancer are the reference group. In BeenUnemp, individuals who have never been unemployed are the reference group. Table E.1 in the appendix presents all the coefficients.

conservative without affecting collectivism. Individuals who had a girl as their first child are approximately 0.03 standard deviations (SD) more conservative than those who had a boy. Similarly, individuals who have ever had cancer are 0.09 SD more conservative. These life events do not directly impact collectivism. For the life event $BeenUnemp$, which is not exogenous, it is associated with a significantly higher level of collectivism, approximately 0.18 SD, and a slightly higher level of conservatism, about 0.02 SD, though this increase is significant at the 10% level.

Time consistency in conservatism is more important than in collectivism. Time consistency coefficients, η, lie around 0.55 SD for conservatism and around 0.49 SD for collectivism. This pattern indicates that conservative values are more correlated over periods than collectivist values. In terms of the theoretical framework, it provides evidence that time consistency is more important for conservatism relative to collectivism. This is consistent with the observation that conservatism is the first principal component and, hence, the most relevant to individuals' social identity.

Table 4: Effect of Values Change on Social Identity

	Multinomial logit - Dep. var.: Vote				
	(Con)	(Grn)	(Lab)	(LD)	(UKIP)
ΔCons_t	-0.06^{***}	-0.19^{***}	-0.17^{***}	-0.10^{***}	0.26^{***}
	(0.02)	(0.06)	(0.02)	(0.02)	(0.05)
ΔColl_t	-0.37^{***}	0.17^{***}	-0.14^{***}	-0.06^{**}	-0.01
	(0.02)	(0.06)	(0.02)	(0.02)	(0.05)
Cons_{t-1}	-0.03	-0.39^{***}	-0.23^{***}	-0.23^{***}	0.23^{***}
	(0.02)	(0.05)	(0.02)	(0.02)	(0.05)
Coll_{t-1}	-0.69^{***}	0.21^{***}	-0.05^{***}	-0.08^{***}	-0.03
	(0.02)	(0.06)	(0.02)	(0.02)	(0.06)
Vote_{t-1}	2.25^{***}	3.26^{***}	2.69^{***}	2.20^{***}	3.07^{***}
	(0.05)	(0.23)	(0.06)	(0.04)	(0.42)
Num. obs.	32885	32885	32885	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables include gender, education (primary, secondary, tertiary), and cohort and period fixed effects. Male in the NCDS58 cohort in his forties with primary education as the reference group. The baseline outcome of the multinomial logistic regression is the vote for Other (encompassing all other parties, blank votes, and abstentions). $Vote_{t-1}$ corresponds to the effect of having voted for the same party in the previous period.

4.2 Value Dynamics and Social Identity

I estimate the effect of a change in values on social identity, proxied by voting behavior for political parties. Let p_s denote the probability of voting for a political party $s \in \{Con, Grn, Lab, LD, UKIP\}$. I consider the $Other$ category (with probability p_O), which encompasses all other parties, blank votes, and abstentions, as the referent group. Thus, I estimate the probability of voting for these political parties using a multinomial logistic regression:

$$\log\left(\frac{p_s}{p_O}\right) = \pi_s + \phi_{1s}\Delta Cons_t + \phi_{2s}\Delta Coll_t + \eta_{1s}Cons_{t-1} + \eta_{2s}Coll_{t-1} + \gamma_s X, \tag{11}$$

where $\Delta v_t \equiv v_t - v_{t-1}$ represents the changes in conservatism and collectivism, conditional on individuals' values in the previous period, i.e., $Cons_{t-1}$ and $Coll_{t-1}$, and also conditional on the political party for which the individual voted in the previous general election. This latter variable is included in the control variables X, along with gender, education, and cohort and period fixed effects. Table 4 summarizes the coefficients.[27]

[27] These coefficients provide the log odds of voting for the political party s relative to the baseline outcome (voting for $Other$). To obtain the effect of a change in a value on the odds of voting for one party with respect to another one, one needs to take the exponential of the difference between both coefficients.

An increase in conservatism raises the probability that individuals vote for more right-wing parties and, hence, identify with more conservative social groups. A 1-SD increase in conservatism raises the odds of voting for the Conservative Party relative to the Labour Party by 12%, and it increases the odds of voting for UKIP relative to the Conservative Party by 37%.[28]

An increase in collectivism raises the probability that individuals vote for more left-wing parties, and, hence, identify with more progressive and collectivist groups. A 1-SD increase in collectivism raises the odds of voting for the Labour Party relative to its historical rival by 26%.[29]

4.3 Spillover Effects Across Values

I test for the existence of spillover effects across values. The ideal setting would use an exogenous and non-reversible life-changing event that directly affects one value but not the other. Thus, if spillover effects exist, one would observe a change in the latter value due to a change in the former one. However, one cannot rule out the possibility that the life-changing event may also indirectly affect the other value.

In pursuit of approximating this ideal setting as closely as possible, I assume that the information shock from the exogenous life event does not directly affect collectivism, i.e., $z \perp Coll$. This assumption is based on the results presented in Section 4.1 where there is no significant direct effect of the exogenous life events on collectivism. Later in the paper, I will consider a weaker assumption and demonstrate similar results in a Simultaneous Equation Model setting.

Under this identification assumption, I estimate IV regressions using two-stage least squares (2SLS). In the first stage, I instrument conservatism $Cons_{it}$ in period t with the life event z_{it} conditional on conservatism in the previous period $Cons_{i,t-1}$ and individual characteristics. In the second stage, I regress collectivism $Coll_{it}$ in period t on the predicted conservatism $\widehat{Cons}_{it}$ conditional on $Coll_{t-1}$ and the same set of individual characteristics. The specification can be written as:

$$Cons_{it} = \alpha_1 + \beta_1 \times z_{it} + \eta_1 \times Cons_{i,t-1} + X_i\delta_1 + u_{1it}, \tag{12}$$

$$Coll_{it} = \alpha_2 + \beta_2 \times \widehat{Cons}_{it} + \eta_2 \times Coll_{i,t-1} + X_i\delta_2 + u_{2it}, \tag{13}$$

where $\widehat{Cons}$ are the predicted $Cons$ and X are control variables including gender, the level of education, and period and cohort fixed effects. Table 5 summarizes the coefficients for the IV

[28] These figures are obtained by taking the exponential of the difference between both associated coefficients, respectively, $\exp(-0.06-(-0.17)) = 1.12$ and $\exp(0.26-(-0.06)) = 0.73$.

[29] This figure is obtained with the following computation: $\exp(-0.14-(-0.37)) = 1.26$.

Table 5: IV Estimate of the Effect of Life Events on Values

	IV regression - 2SLS			
	GirlFirst		GotCancer	
	(Cons)	(Coll)	(Cons)	(Coll)
Life event	0.03^{**}		0.09^{***}	
	(0.01)		(0.03)	
$\widehat{\text{Cons}}_t$		-0.32^{***}		-0.34^{***}
		(0.01)		(0.01)
Value_{t-1}	0.54^{***}	0.48^{***}	0.56^{***}	0.49^{***}
	(0.01)	(0.01)	(0.00)	(0.00)
R^2	0.37	0.30	0.39	0.31
Adj. R^2	0.37	0.30	0.39	0.31
Num. obs.	23354	23354	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables include gender, education (primary, secondary, tertiary), and cohort and period fixed effects. Male in the NCDS58 cohort in his forties with primary education as the reference group. GirlFirst and GotCancer are the life events. In GirlFirst regressions, parents who have had a boy as a first child are the reference group. In GotCancer regressions, individuals who never had a cancer are the reference group. Table E.2 in the appendix presents all the coefficients.

regressions (see Table E.2 in Appendix E for all the coefficients).

In both first-stage regressions, the effect of the life event as an information shock on conservatism is positive and significant. Having a girl instead of a boy as a first child increases conservatism by 0.03 SD, while having ever had cancer raises conservatism by 0.09 SD.

In both second-stage regressions, the spillover effect is negative and significant. For the first life event, a 1-SD increase in conservatism decreases collectivism by 0.32 SD; similarly, an increase of the same magnitude for the second life event reduces collectivism by 0.34 SD. As collectivism decreases, it means that individualism increases.

Both exogenous and irreversible life events show that changes in conservatism spill over into collectivism. Within my theoretical framework, I propose that this spillover effect is driven by changes in social identity. To test this mechanism, I estimate a second-stage IV multinomial logistic regression to assess the probability of voting for a political party, where the first stage is given by Equation 12. Thus, the second stage is as follows:

$$\log\left(\frac{p_s}{p_O}\right) = \pi'_s + \beta_s \times \widehat{Cons}_{it} + \gamma_s X, \tag{14}$$

where $\widehat{Cons}$ are the predicted values of conservatism from the first-stage IV regression, and X

Table 6: IV Estimate of the Effect of Life Events on Social Identity

	IV regression - GirlFirst - Multinomial logit - Dep. var.: Vote				
	(Con)	(Grn)	(Lab)	(LD)	(UKIP)
$\widehat{\text{Cons}}_t$	0.01	-0.85^{***}	-0.27^{***}	-0.34^{***}	0.18^{*}
	(0.03)	(0.10)	(0.03)	(0.04)	(0.09)
Vote_{t-1}	2.56^{***}	3.75^{***}	2.73^{***}	2.19^{***}	3.25^{***}
	(0.05)	(0.31)	(0.08)	(0.05)	(0.49)
Num. obs.	23354	23354	23354	23354	23354
	IV regression - GotCancer - Multinomial logit - Dep. var.: Vote				
	(Con)	(Grn)	(Lab)	(LD)	(UKIP)
$\widehat{\text{Cons}}_t$	0.08^{***}	-0.67^{***}	-0.24^{***}	-0.32^{***}	0.19^{**}
	(0.03)	(0.07)	(0.02)	(0.03)	(0.07)
Vote_{t-1}	2.56^{***}	3.31^{***}	2.71^{***}	2.21^{***}	3.06^{***}
	(0.04)	(0.23)	(0.06)	(0.04)	(0.42)
Num. obs.	32885	32885	32885	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables include gender, education (primary, secondary, tertiary), and cohort and period fixed effects. Male in the NCDS58 cohort in his forties with primary education as the reference group. GirlFirst and GotCancer are the life events. In GirlFirst regressions, parents who have had a boy as a first child are the reference group. In GotCancer regressions, individuals who never had cancer are the reference group. The baseline outcome of the multinomial logistic regression is the vote for Other (encompassing all other parties, blank votes, and abstention). $Vote_{t-1}$ corresponds to the effect of having voted for the same party in the previous period. Table E.3 and E.4 in the appendix present all the coefficients for both life events.

includes control variables such as the vote in the previous general election, gender, education, and cohort and period fixed effects.

Table 6 summarizes the coefficients for the second-stage IV multinomial logistic regression (see Tables E.3 and E.4 in Appendix E for all the coefficients for both life events). The top panel presents the estimates of the relative probabilities of voting for each political party, with conservative values instrumented by the $GirlFirst$ life event. The bottom panel provides the same estimates but with conservative values instrumented by the $GotCancer$ life event.

The coefficients are fairly similar across both life events, indicating their comparable effects on the probabilities of voting for one political party over another. A notable exception is observed in the coefficient of interest within the Conservative column (Con), which is positive but not significant for the $GirlFirst$ life event, whereas it becomes significant for the $GotCancer$ life event.

The observed changes in voting behavior, attributable to changes in values influenced by

life-changing events, are consistent with the positioning of political parties within the two-dimensional value space illustrated in Figure 4. This consistency provides empirical evidence supporting social identity as the underlying mechanism for the observed spillover effects.

To summarize, both exogenous and irreversible life-changing events show that spillover effects contribute to a third of the information shock. These findings further reveal that an increase in conservatism leads to an increase in individualism (i.e., a decrease in collectivism). The observed changes in voting behavior, following life-changing events, align with the positioning of political parties within the two-dimensional value space, supporting social identity as the driving mechanism. However, the identification of these effects relies on the assumption that the information shock, associated with the life event, does not directly influence collectivism, i.e., $Coll \perp z$. This assumption may be overly restrictive for such life events. In the next section, a weaker assumption is introduced, using a simultaneous equation model.

5 Simultaneous Equations Model

The identification of the spillover effect, as discussed in the previous section, hinges on the exclusion restriction, which posits that the information shock, arising from a life event, impacts only conservatism. This assumption might be considered overly stringent.

In this section, I use a simultaneous equations model, which accommodates less restrictive assumptions for identification. First, I present the empirical specification and its underlying identification assumption. Second, I decompose the total effect into the direct effect of the life-changing event on values and the indirect effect attributable to spillover effects. Third, I discuss the regularities in the patterns of the spillover effects and establish connections with the social psychology literature.

5.1 Empirical Specification

I consider a Simultaneous Equations Model (SEM) in which conservatism and collectivism are jointly determined, influenced by their respective values in the previous period, and related to individual characteristics. Each observation consists of an individual i observed in period t. With two values involved, the structural form of the SEM can be represented in matrix notation as:

$$V_{i,t}\Gamma = z_{i,t}\Theta + V_{i,t-1}H + X_iB + U_{i,t} \tag{15}$$

where $V_{i,t} = \begin{bmatrix} Cons_t & Coll_t \end{bmatrix}$ is the matrix of dependent values in period t, z is a vector indicating the occurrence of a life-changing event, X includes individual characteristics such as

gender, level of education, and cohort and period fixed effects, and U represents the matrix of error terms.

The coefficient matrices are defined as follows:

$$\Gamma = \begin{pmatrix} 1 & -\gamma_2^1 \\ -\gamma_1^2 & 1 \end{pmatrix}, \quad \Theta = \begin{pmatrix} \theta_1 \\ \theta_2 \end{pmatrix}, \quad H = \begin{pmatrix} \eta_1 & 0 \\ 0 & \eta_2 \end{pmatrix},$$

where Γ describes the interrelation between values, Θ quantifies the direct impact of the life event on each value, H describes the time consistency of values, and B pertains to the coefficients associated with X.

Multiplying Equation (15) by Γ^{-1} leads to the reduced form of the SEM such as:

$$V_{i,t} = z_{i,t}\Phi + V_{i,t-1}\Psi + X_i\Pi + \epsilon_{i,t}, \tag{16}$$

where $\Phi = \Theta\Gamma^{-1}$, $\Psi = H\Gamma^{-1}$, $\Pi = B\Gamma^{-1}$, and $\epsilon = U\Gamma^{-1}$.

Identification. In this SEM, the identification assumption posits that one value is not *directly* influenced by the lag of the other value, that is, $Coll_t \perp Cons_{t-1}$ and $Cons_t \perp Coll_{t-1}$.[30] This assumption aligns with the theoretical framework wherein values are assumed to adjust over time to maintain consistent values. It implies that any change in $Coll_{t-1}$ may influence $Cons_t$, but this influence occurs only through $Cons_{t-1}$.

The *rank condition* is satisfied for both equations because the number of excluded endogenous variables in the reduced form (either $Cons_t$ or $Coll_t$) matches the number of excluded exogenous variables in the structural form (either $Coll_{t-1}$ or $Cons_{t-1}$). This ensures that the SEM can be identified.

In addition, the *order condition* is also satisfied for both equations, as the number of excluded exogenous variables ($Cons_{t-1}$ and $Coll_{t-1}$) is also equal to the number of included endogenous variables ($Cons_t$ and $Coll_t$). Thus, the SEM is exactly identified.

This identification strategy is less restrictive compared to the assumption discussed in Section 4.3 and consistent with the theoretical framework in Section 2.

Estimation. I estimate the SEM with 2SLS by instrumenting the endogenous variables in each equation with all exogenous variables from both equations. In the first step, I estimate the reduced form as described in Equation (16) and obtain the predicted values for conservatism and collectivism, i.e. $\widehat{Cons}_t$ and $\widehat{Coll}_t$.

[30] In Equations (15) and 16, the exclusion restriction corresponds to the zeros in the H matrix.

In the second step, I estimate the structural form, where the endogenous variables are replaced with the predictions obtained from the first step. The system of equations estimated is as follows:

$$\widetilde{V}_{i,t}\Gamma = z_{i,t}\Theta + V_{i,t-1}H + X_iB + U_{i,t}$$

where $\widetilde{V}_{i,t} = \begin{bmatrix} v_t & -\hat{v}_t \end{bmatrix}$ in which v_t is the dependent value and $-\hat{v}_t$ is the predictions of the endogenous value from the first step estimate. The 2SLS estimates of the SEM for all life events, which are analyzed below, are presented in Appendix E.

5.2 Decomposing the Effect on Values

One of the advantages of the SEM is that one can decompose the effect of life-changing events into the sum of a direct effect, which is the impact of the information shock on values, and an indirect effect, capturing the alignment of values with the (new) social identity, that is, the spillover effect.

From the reduced form, I decompose the total effect of the life event z on value $v \in V = \{v, -v\}$, where v is the value of interest and $-v$ the other value, as follows:

$$\phi_v = \underbrace{\tilde{\gamma}_v^v \times \theta_v}_{\text{Direct effect}} + \underbrace{\tilde{\gamma}_v^{-v} \times \theta_{-v}}_{\text{Indirect effect}}, \tag{17}$$

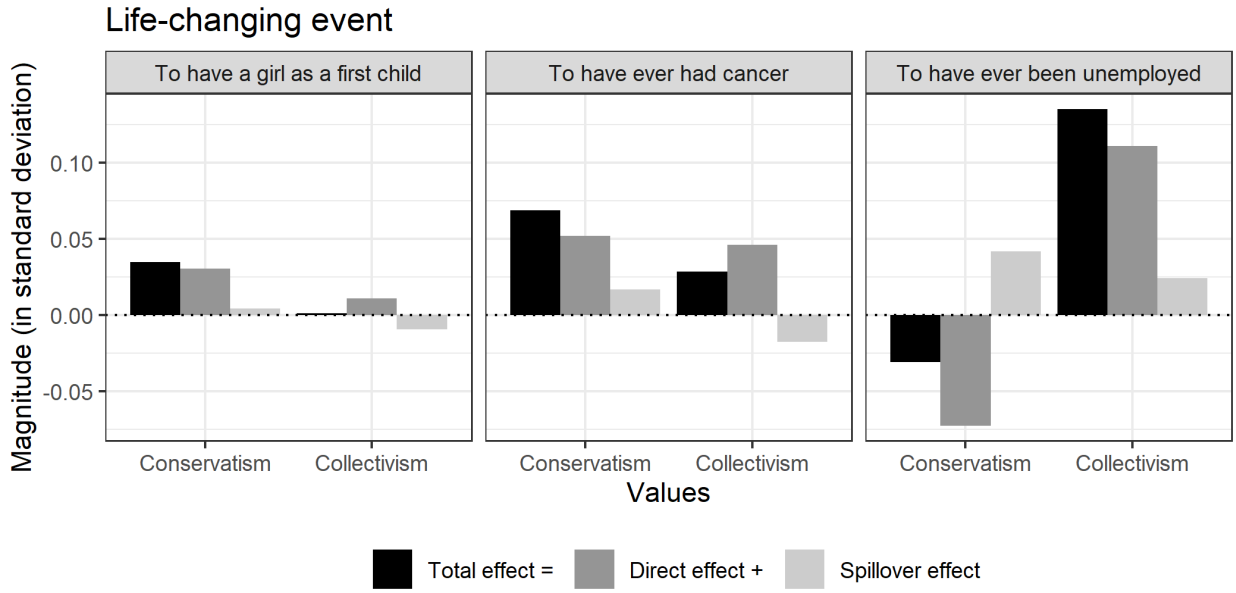
where ϕ_v is the total effect of the life event z on value v, $\tilde{\gamma}_v^v$ is the element on the diagonal of Γ^{-1} associated to the value v, $\tilde{\gamma}_v^{-v}$ is the off-diagonal element of Γ^{-1} on the same column, while θ_v and θ_{-v} are respectively the information shocks associated to the life event z on values v and $-v$ from the structural form in Equation (15).

Figure 5 presents the decomposition of the total effect of each life-changing event on values between the information shock (direct effect) and the spillover effect (indirect effect). I describe the results by life-changing events.

Girl First. Collectivism remains unchanged when an individual has a girl as their first child, rather than a boy, while conservatism increases. Having a girl as a first child *directly* increases conservatism by 0.03 SD and collectivism by 0.01 SD. As this life event increases conservatism, it *indirectly* increases individualism, thereby nullifying the direct increase in collectivism. Furthermore, this *direct* increase in collectivism also spills over and *indirectly* increases conservatism. This indirect channel amplifies the total change in conservatism by 14% (0.004 SD).

Exploration of heterogeneity among parents affected by this life event reveals two additional insights (refer Figures E.1 and E.2 in Appendix E).

Figure 5: Decomposition of the Effect of Life-Changing Events on Values



Notes: This figure presents the decomposition of the total effect of each life-changing event on both values, Conservatism and Collectivism. The magnitude of effects is expressed in standard deviation. Decompositions are respectively derived from Tables E.8, E.9 and E.10.

First, the direct effects for both mothers and fathers are aligned (increased conservatism and collectivism), yet they are more pronounced for mothers. For fathers, the negative spillover effect on collectivism counteracts the positive information shock, leading to an increase in individualism.

Second, an analysis segmented by parents' education level indicates that those with secondary education are the most affected. The impact of having a girl as a first child on parents with tertiary education tends towards more progressive values. This finding aligns with the results of Washington (2008), demonstrating that congresspersons, predominantly highly educated men, adopt more progressive voting behaviors after having daughters.

These results imply that parents with tertiary education lean towards progressivism upon having a daughter as their first child, motivated by a desire for greater gender equality for her. In contrast, parents with primary or secondary education tend to shift towards conservatism, prioritizing societal authority due to concerns about their daughters' increased exposure. This contrasts with the focus on gender equality observed among highly educated parents.

Got Cancer. Both conservatism and collectivism increase when an individual has ever had cancer. This life-changing event directly increases both conservatism and collectivism by 0.05 SD. The increase in collectivism spills over conservatism and increases the latter by 0.02 SD,

which represents almost a fourth of the total effect on conservatism. Meanwhile, the direct increase in collectivism is partially offset by the fact individualism rises by 0.02 SD as a spillover, which corresponds to 38% of the direct effect. Thus, without spillovers, the increase in collectivism would have been 38% larger.

Concerns may arise regarding the NCDS58 cohort at age 50, as they are likely to anticipate sickness, thus changing their values before the life event occurs. Excluding the NCDS58 cohort at age 50 provides very similar results with respect to the full sample, whereas considering exclusively this cohort at that age shows that the direct effect on conservatism is four times larger with respect to the baseline specification (see Figure E.3 in Appendix E). Interestingly, the direct effect on collectivism is much closer to zero. Thus, those who have had cancer at age 50 are not different from those who have not had one. Such an effect may be due to the anticipation of the sickness of the whole cohort at that age as they will rely more on others, hence, they increase their collectivism. Nonetheless, the total effect on collectivism is positive—about 0.1 SD—which is mostly due to the positive spillover effect on collectivism. I also provide these estimates by focusing only on individuals who have never had cancer in the previous period (see Figure E.4 in Appendix E). Although the direct effect on collectivism is larger, qualitative results hold.

Been Unemployed. Having ever been unemployed is associated with higher progressivism and collectivism. Focusing on the third panel, those who have ever been unemployed experience a direct decline in conservatism, i.e., an increase in progressivism, by 0.07 SD and a direct increase in collectivism by 0.11 SD. The increase in progressivism spills over into collectivism and increases it by 0.02 SD, that is, 22%. Meanwhile, the increase in collectivism spills over into conservatism, which offsets half of the direct increase in progressivism. As a result, the increase in conservatism is dampened by the spillover effect whereas collectivism increases substantively.[31]

Concerns may arise regarding the current employment status being the driving factor for the effect of having ever been unemployed on values. I estimate the SEM using two subsamples (see Figure E.5 in Appendix E). First, I remove unemployed individuals at the time of the interview, and then, I remove those who are out-of-work (unemployed and inactive). Both estimates do not differ with respect to the full sample.

[31] In the extension of the theoretical framework in Appendix F, I show that there is a bias when measuring the effect of an endogenous life event—such as unemployment—on values and I derive its expression. The bias does not affect the relative shares of the total effect that are due to the direct and spillover effects, nor the sign of the latter. However, the bias may affect the magnitude of the effect. In an extreme case of endogeneity of unemployment to values, the magnitudes have to be multiplied by a factor of 2/5, whereas feasible scenarios are likely to lie within a scale factor ranging from 1 (no endogeneity) to 2/3.

5.3 The Dynamics of Spillover Effects

In the SEM, the spillover effects appear through Γ^{-1} and are the same regardless of the life event considered. For instance, in the case of the $GirlFirst$ life event, I have:

$$\Gamma = \begin{pmatrix} 1 & 0.39 \\ -0.31 & 1 \end{pmatrix} \implies \Gamma^{-1} = \begin{pmatrix} 0.89 & -0.35 \\ 0.28 & 0.89 \end{pmatrix}.$$

For both other life events, the coefficients in the matrices Γ are very similar, indicating that spillover effects are not dependent on the specific life event but are inherent.[32] Therefore, the effect of the life event Z on values is determined from the matrix product of $\Theta = \begin{pmatrix} \theta_{Cons} & \theta_{Coll} \end{pmatrix}$ and the propagation matrix Γ^{-1}, which accounts for both direct and spillover effects.

Considering the effect of the life event on both values as a homogeneous system of first-order linear differential equations yields:

$$\begin{aligned} \phi_{Cons} &= 0.89 \times \theta_{Cons} + 0.28 \times \theta_{Coll}, \\ \phi_{Coll} &= -0.35 \times \theta_{Cons} + 0.89 \times \theta_{Coll}, \end{aligned}$$

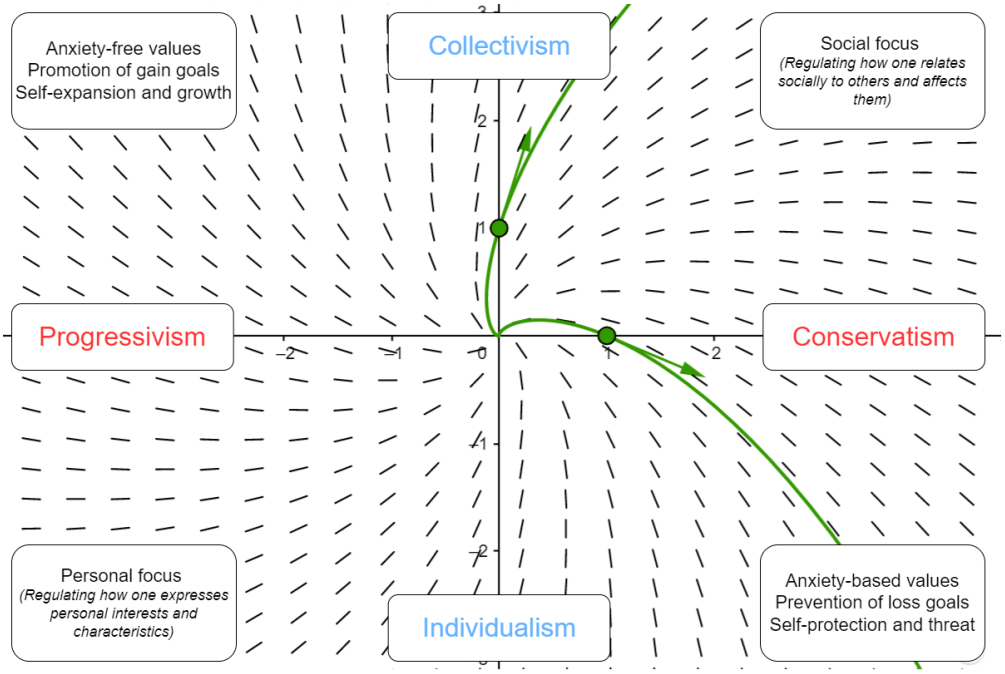
where θ_{Cons} and θ_{Coll} are the magnitudes of both information shocks from Θ, while ϕ_{Cons} and ϕ_{Coll} correspond to the net effects on values from Φ. Solving this system results in complex eigenvalues with positive real parts, due to the diagonal coefficients in Γ being equal to one and the off-diagonal coefficients having opposite signs.

Figure 6 illustrates the phase plane of this system. Both points are set to 1 on both axes; hence, the arrows depict the change in values resulting from a 1-SD increase on either the x-axis or the y-axis, at is, in conservatism or collectivism. An increase in conservatism has a negative spillover effect on collectivism, whereas an increase in collectivism has a positive spillover effect on conservatism. Therefore, the relationship between values is *not reciprocal*, due to the spiral pattern observed in the system of first-order linear differential equations derived from the propagation matrix Γ^{-1}.

The social psychology literature offers dynamic principles that shed light on the spiral pattern observed in value changes. These principles are aligned with the dynamic foundations of shifts in values and are represented by the four corners of the figure (see Schwartz 2012 for more details). For example, a simultaneous increase in both conservatism and collectivism, moving towards the top-right corner, signifies a shift towards a *social focus*, that is, a preference for living within a community and reinforcing the stability, tradition, and conformity to

[32] See Tables E.6 and E.7 in the appendix, from which the Γ matrix can be derived. For the $GotCancer$ life event, $\Gamma = \begin{pmatrix} 1 & 0.37 \\ -0.34 & 1 \end{pmatrix}$. For the $BeenUnemp$ life event, $\Gamma = \begin{pmatrix} 1 & 0.37 \\ -0.33 & 1 \end{pmatrix}$.

Figure 6: The Dynamics of Spillover Effects Across Values



Notes: This figure presents the phase plane of the homogeneous system of first-order linear differential equations that describes the relationship between conservatism (versus progressivism) and collectivism (versus individualism) values. Green arrows decompose the direct effect and the indirect effect, i.e., spillover effect, due to a one standard deviation increase in each value.

that community. In contrast, a decrease in these values, moving towards the bottom-left corner, indicates a shift towards a *personal focus*, where there is a preference for individual autonomy and a resistance to being constrained by community rules. Looking at the other corners, an increase in individualism along with conservatism, moving towards the bottom-right corner, reflects a change in values towards those who are self-protective, dealing with anxiety and fear of losing goals. Conversely, the top-left corner represents values that are self-expansive and free from anxiety.

Exploring the spiral pattern of spillover effects through the perspective of dynamic changes in values, as understood through social psychology, offers multiple insights into how life events influence individuals' values, as depicted in Figure 5. First, for both the girl-first and got-cancer life events, an increase in conservatism leads to a spillover in individualism, as these events are associated with anxiety and, consequently, self-protective values. Simultaneously, an initial increase in collectivist values enhances conservatism through a positive spillover, fostering a social focus, that is, greater reliance on the community and its norms. For the been-unemployed life event, an initial rise in progressivism signals an embrace of anxiety-free values, diminishing the relevance of unemployment fears compared to those never unemployed, thus avoiding losses. This increase in anxiety-free values positively influences collectivism.

The direct effect on collectivism is positive, as the individual had leaned more on the community during unemployment, thus augmenting social focus and, consequently, conservative values.

6 Conclusion

Extensive literature has explored the effects of life experiences, such as parenthood, illness, or unemployment, on values while assuming that these values are independent, thus overlooking the indirect consequences of changes in one value on other values. In this paper, I demonstrate that values are interdependent, as they are central to individuals' social identity. My results suggest that the interdependence between values, rooted in social identity, plays a significant role in the dynamics of values. This interdependence arises from individuals' desire to maintain consistency with the values prevalent in the social group with which they identify. Therefore, I reveal that overlooking this mechanism underestimates the extent to which life events can influence individuals' values and social identity.

The empirical analysis shows the model's predictions align with the observed data. By using exogenous life-changing events, such as the gender of the first child at birth, I find that both values and social identity (proxied by political voting behavior) undergo changes following these life events. Additionally, this paper introduces a novel methodology for identifying values based on statements regarding attitudes, using principal component analysis.

This paper highlights a topic that has been largely overlooked in economic studies: the impact of life events on values and social identity. Given that values form the foundation of agents' preferences, which in turn can account for disparities in economic outcomes, I propose that incorporating the dynamics of values into future work could elucidate how observed differences among individuals may stem from varied experiences with life events.

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Appendices

A Model details

This appendix presents the details of the theoretical framework.

Proof of Proposition 1. The value converges as $\lim_{t\to+\infty} a_t = a^\star$ since $(\eta_a, \phi_a) \in (\mathbb{R}_+^\star)^2$. The rate of convergence $\eta_a/(\eta_a+\phi_a)$ is a decreasing in ϕ_a/η_a. The smaller the rate of convergence, the faster the speed of convergence. Therefore, the speed of convergence is an increasing function of the relative weight of the group consistency with respect to the time consistency in the utility function. ■

Proof of Proposition 2. $\forall s \in \{1,2\}, \forall a_t \in \mathbb{R},\ \exists |\Delta a_t| > |\Delta \tilde{a}_t|$ such that $\lim_{t\to+\infty} a_{t+1} = a^\star(-s_t)$ ■

Proof of Proposition 3. Starting with the expression of the indifference value $\tilde{a}$ from equation (9), it is straightforward to show that $\frac{\partial^2 \tilde{a}}{\partial(\bar{b}_2-\bar{b}_1)^2} > 0$. In this example, $\tilde{a}$ is a convex function of $\bar{b}_2 - \bar{b}_1$. Thus, the greater the gap between both groups in value b with respect to value a, the greater the information shock in value a has to be so that the agent identifies with the other group. Therefore, the less relevant is this latter value in its choice of social identity. ■

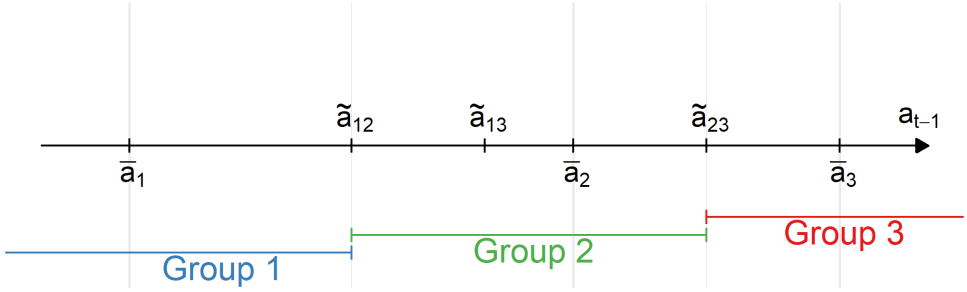
Proof of Proposition 4. If $\bar{b} - \underline{b} \neq 0$, then $\exists \Delta a_{t-1}$ such that $|a'_{t-1}| > |\tilde{a}_{t-1}|$ which implies that the individual identifies to the other group in period t. Therefore, both values a_t and b_t converge toward those of the other group. ■

Theoretical framework with three groups. One may ask to which extent the results hold with more than two groups. So, suppose that instead of having two groups in the reference population, we introduce a third group between both groups. I refer to the former groups as s_A and s_C instead of $\bar{s}$ and $\underline{s}$, while s_B is the new group.

Starting with the single-value model, the ranking is as follows $a_A < a_B < a_C$. Reproducing figure 1 but with three groups leads to figure A.1. Introducing an additional group does not change the indifference value between two groups—which remains the midpoint value. Propositions 1 and 2 hold in the three-group model.

Consider the two-value model by introducing the second value b. Assume the following ranking $a_C < a_B < a_A$ and $b_C < b_B < b_A$, which means that values are positively correlated across groups. I use the simplest case as an example, but other types of ranking are possible. Suppose the setup of section 2 with respect to the agent. She belongs to the group with the lowest value a, hence, s_A. It is still possible to derive the expression of the indifference value

Figure A.1: Indifference value and group membership (with three groups)



Notes: This figure is an extension of figure 1 when there are three groups instead of two in the single value model. The figure presents the indifference values $\tilde{a}_{ij}$ which are defined as the threshold values a in $t-1$ such that the agent is indifferent between two groups. When the value a in previous period lie in the area of one group, the agent prefers to identify to this group.

between the groups A and $j \in \{B, C\}$ from equation (9), namely,

$$\tilde{a}_{Aj} = \hat{a}_{Aj} + \frac{1}{2\gamma} \frac{(b_j - b_A)^2}{a_j - a_A}, \tag{18}$$

where $\hat{a}_{Aj}$ is the midpoint value between those of both groups A and j. Since $a_j - a_A > 0$, it means that the second term of (18) is positive. As a result, the indifference value $\tilde{a}$ is greater than the midpoint value. Both frontiers are pushed further right with respect to the single-value model in figure A.1.

Under those conditions, it is still always possible to find an information shock such that the agent changes her group. Therefore, both propositions 3 and 4 hold. Although spillover effects still exist, their magnitudes are different with respect to the case with the two groups. Information shocks that move a'_{t-1} between $\tilde{a}_{AB}$ and $\tilde{a}_{BC}$ generate smaller spillover effects—with respect to the two-group model—as the agent identifies to the group s_B; while shocks that move a'_{t-1} beyond $\tilde{a}_{BC}$ generate larger spillover effects.

B Statement details

This appendix presents the details of statements according to attitudes and their availability in interviews. Table B.1 presents the number of available statements at each interview. Tables B.2, B.3 and B.4 present the details of statement by attitudes.

Table B.1: Number of available statements at each interview

	BCS70			NCDS58		
Attitude	26	30	42	33	42	50
Authority	4	6	3	6	6	3
Anti-Racism		5	2	5	5	3
Children		4	2	2	4	
Environment		3	2	3	3	3
Inequality Aversion	1	7	5	7	7	3
Info. Techno.		4			4	
Learning		4			4	
Morale	3	6	3	6	6	3
Political Cynicism	3	3	3	3	3	3
Work Ethic	2	3	3	3	3	3
Working Mother		5	2		5	

Notes: This table presents the number of available statements in each attitudes at each age for the NCDS58 and BCS70 cohorts. Details on statements are reported in Tables B.2, B.3 and B.4.

Table B.2: Statements details by attitudes - Part 1/3

Variable	Question	Rev
Authority (A)		
A1	The law should be obeyed, even if a particular law is wrong?	
A2	For some crimes the death penalty is the most appropriate sentence?	
A3	Censorship of films and magazines is necessary to uphold moral standards?	
A4	People who break the law should be given stiffer sentences?	
A5	Young people today don't have enough respect for traditional British values?	
A6	Schools should teach children to obey authority?	
Anti-Racism (AR)		
AR1	It is alright for people from different races to get married?	
AR2	I would not mind if a family from another race moved in next door to me?	
AR3	I would not mind if my child went to a school where half the children were of another race?	
AR4	I would not mind working with people from other races?	
AR5	I would not want a person from another race to be my boss?	X
Children (C)		
C1	Unless you have children you'll be lonely when you get old?	
C2	People can have a fulfilling life without having children?	X
C3	Having children seriously interferes with the freedom of their parents?	X
C4	People who never have children are missing an important part of life?	
Environment (E)		
E1	Problems in the environment are not as serious as people claim?	X
E2	We should tackle problems in the environment even if this means slower economic growth?	
E3	Preserving the environment is more important than any other political issue today?	

Notes: The *Rev* column indicates whether the scale has been reversed in the analysis to make it consistent with the other questions.

Table B.3: Statements details by attitudes - Part 2/3

Variable	Question	Rev
Inequality Aversion (IA)		
IA1	Big business benefits owners at the expense of the workers?	
IA2	Private schools should be abolished?	
IA3	Management will always try to get the better of employees if it gets the chance?	
IA4	The time has come for everyone to arrange their own private health care and stop relying on the NHS?	X
IA5	Ordinary working people do not get their fair share of the nation's wealth?	
IA6	Government should redistribute income from the better off to those who are less well off?	
IA7	There is one law for the rich and one for the poor?	
Information Technology (IT)		
IT1	Computers at work are destroying people's skills?	X
IT2	Computers enrich the lives of those who use them?	
IT3	Every family should have a computer?	
IT4	Learning to use a computer is more trouble than it's worth?	X
Learning (L)		
L1	You are more likely to get a better job if you do some learning, training or education?	
L2	For getting jobs, knowing the right people is more important than the qualifications?	X
L3	Learning about new things boosts your confidence?	
L4	The effort of getting qualifications is more trouble than it's worth?	X
Morale (MOR)		
MOR1	Divorce is too easy to get these days?	
MOR2	Married people are generally happier than unmarried people?	
MOR3	Couples who have children should not separate?	
MOR4	Marriage is for life?	
MOR5	All women should have the right to choose an abortion if they wish?	X
MOR6	It is alright for people to have children without being married?	X

Notes: The *Rev* column indicates whether the scale has been reversed in the analysis to make it consistent with the other questions.

Table B.4: Statements details by attitudes - Part 3/3

Variable	Question	Rev
Political Cynicism (PC)		
PC1	None of the political parties would do anything to benefit me?	
PC2	It does not really make much difference which political party is in power in Britain?	
PC3	Politicians are mainly in politics for their own benefit and not for the benefit of the community?	
Work-Ethic (WE)		
WE1	Having almost any job is better than being unemployed?	
WE2	If I didn't like a job I'd pack it in, even if there was no other job to go to?	X
WE3	Once you've got a job it's important to hang on to it even if you don't really like it?	
Working Mother (WM)		
WM1	A pre-school child is likely to suffer if his or her mother works?	X
WM2	All in all, family life suffers when the mother has a full time job?	X
WM3	Children benefit if their mother has a job outside the home?	
WM4	A mother and her family will all be happier if she goes out to work?	
WM5	A father's job is to earn money; a mother's job is to look after the home and family?	X

Notes: The *Rev* column indicates whether the scale has been reversed in the analysis to make it consistent with the other questions.

C Principal component analysis

This appendix presents the principal components eigenvectors from the Principal Component Analysis (PCA) in section 3. Table C.1 presents the eigenvectors for the BCS70 cohort, while table C.2 displays those for the NCDS58 cohort.

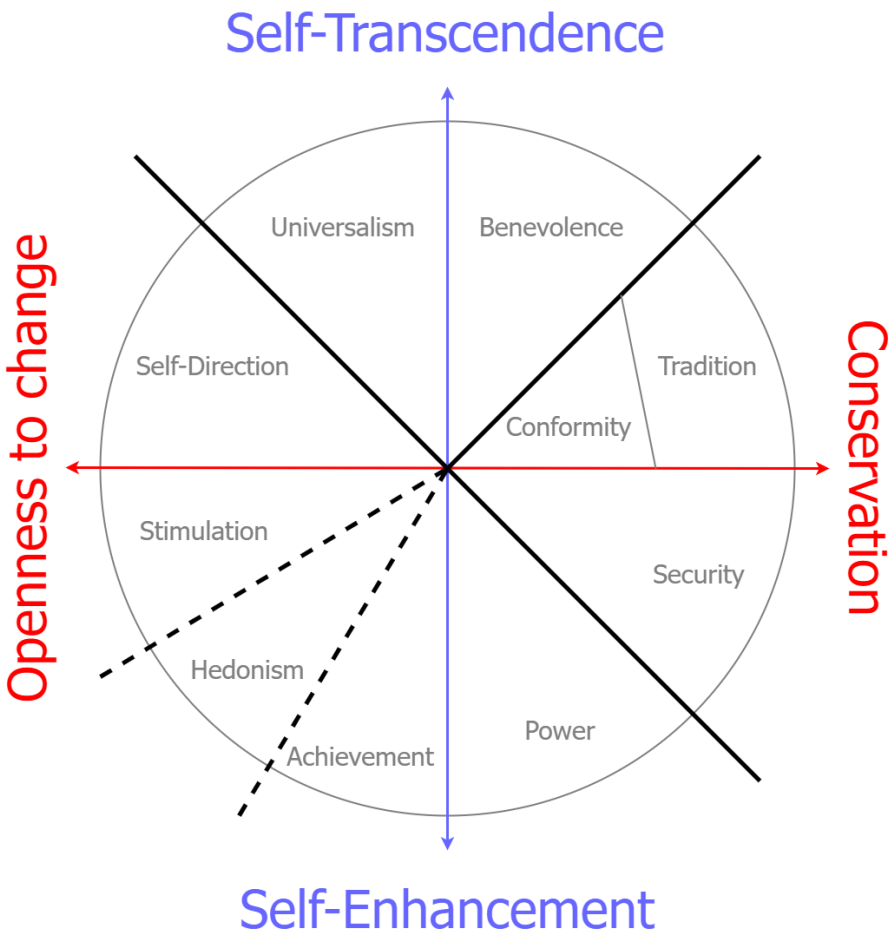
Table C.1: Principal components eigenvectors for the BCS70 cohort

	PC1	PC2	PC3	PC4	PC5
Age 26					
Authority	0.622	0.011	0.136	-0.146	-0.757
Inequality Aversion	-0.182	0.686	-0.533	0.348	-0.303
Morale	0.521	0.244	-0.453	-0.513	0.449
Political Cynicism	0.149	0.656	0.695	0.065	0.245
Work Ethic	0.535	-0.200	-0.093	0.769	0.272
Standard deviation	1.262	1.087	0.929	0.866	0.783
Proportion of Variance	0.319	0.236	0.173	0.150	0.123
Cumulative Proportion	0.319	0.555	0.727	0.877	1.000
Age 30					
Authority	0.614	-0.162	-0.050	0.281	-0.718
Inequality Aversion	0.153	0.702	0.013	-0.638	-0.278
Morale	0.534	-0.109	-0.678	-0.202	0.450
Political Cynicism	0.326	0.605	0.221	0.592	0.359
Work Ethic	0.456	-0.321	0.699	-0.351	0.276
Standard deviation	1.243	1.137	0.918	0.827	0.797
Proportion of Variance	0.309	0.259	0.169	0.137	0.127
Cumulative Proportion	0.309	0.568	0.736	0.873	1.000
Age 42					
Authority	0.570	-0.360	-0.004	-0.519	-0.526
Inequality Aversion	0.172	0.722	0.172	0.280	-0.584
Morale	0.462	-0.048	-0.749	0.466	0.079
Political Cynicism	0.517	0.474	0.122	-0.368	0.598
Work Ethic	0.406	-0.350	0.628	0.548	0.135
Standard deviation	1.184	1.124	0.968	0.882	0.787
Proportion of Variance	0.281	0.253	0.187	0.156	0.124
Cumulative Proportion	0.281	0.533	0.721	0.876	1.000

Table C.2: Principal components eigenvectors for the NCDS58 cohort

	PC1	PC2	PC3	PC4	PC5
Age 33					
Authority	0.607	-0.150	0.155	-0.546	0.535
Inequality Aversion	0.006	0.730	-0.072	0.353	0.580
Morale	0.548	-0.077	0.551	0.591	-0.201
Political Cynicism	0.276	0.654	0.053	-0.414	-0.567
Work Ethic	0.504	-0.102	-0.815	0.237	-0.122
Standard deviation	1.250	1.162	0.901	0.851	0.741
Proportion of Variance	0.313	0.270	0.162	0.145	0.110
Cumulative Proportion	0.313	0.583	0.745	0.890	1.000
Age 42					
Authority	0.605	-0.141	-0.156	0.369	0.674
Inequality Aversion	0.173	0.713	0.178	-0.559	0.342
Morale	0.500	-0.245	-0.542	-0.534	-0.333
Political Cynicism	0.446	0.521	0.038	0.480	-0.546
Work Ethic	0.395	-0.375	0.805	-0.187	-0.144
Standard deviation	1.258	1.101	0.916	0.875	0.775
Proportion of Variance	0.317	0.242	0.168	0.153	0.120
Cumulative Proportion	0.317	0.559	0.727	0.880	1.000
Age 50					
Authority	0.531	-0.134	0.063	-0.816	-0.173
Inequality Aversion	0.554	0.296	-0.075	0.441	-0.637
Morale	0.157	-0.663	-0.716	0.152	0.018
Political Cynicism	0.578	0.264	-0.063	0.170	0.750
Work Ethic	0.229	-0.620	0.689	0.296	0.033
Standard deviation	1.373	1.046	0.945	0.804	0.694
Proportion of Variance	0.377	0.219	0.179	0.129	0.096
Cumulative Proportion	0.377	0.596	0.775	0.904	1.000

Figure C.1: Two-dimensional structure of universal motivational types of values



Notes: This figure reproduces the two-dimensional structure of motivational types of values from Schwartz (1992, 2012).

D Data details

This appendix presents the details of the data. Table D.1 shows the shares of vote in general elections in both cohorts.

Table D.1: Shares of vote in general elections in both cohorts

		Proportion of total (in percent)					
		Other	Con	Grn	Lab	LD	UKIP
BCS70	Age 26 (GE 1997)	45.5	15.6	0.5	30.8	7.6	
BCS70	Age 30 (GE 2001)	51.6	13.0	1.0	25.8	7.8	0.8
BCS70	Age 42 (GE 2010)	30.4	28.8	1.7	23.1	14.3	1.7
NCDS58	Age 33 (GE 1987)	27.6	34.0		26.8	11.6	
NCDS58	Age 42 (GE 1997)	27.6	21.5	0.6	40.5	9.8	
NCDS58	Age 50 (GE 2010)	43.2	22.9	1.1	19.0	10.8	3.0

Notes: This table presents the vote proportions (in percentage) for both cohorts at different ages according to the closest General Election (GE). Political parties are (in alphabetical order): Conservative (Con), Green (Grn), Labour (Lab), Liberal Democrat (LD), and UK Independence Party (UKIP). Other encompasses all other parties, blank votes, and abstention.

E Estimates

This appendix presents additional regression tables of the paper. Table E.1 presents the long-version table of the regression table 3 in the paper. Table E.2 presents the IV estimate of the spillover effects. Tables E.3 and E.4 correspond to the IV estimate of the group membership. Table E.5, E.6, and E.7 present the details of the 2SLS estimates of the SEM for, respectively, the girl-first, got-cancer, and been-unemployed life event. Tables E.8, E.9, and E.10 summarize the decomposition of the total effect from the SEM for, respectively, the girl-first, got-cancer, and been-unemployed life event. Figure E.1 summarizes the decomposition of the total effect of girl-first life event by parent. Figure E.2 summarizes the decomposition of the total effect of girl-first life event by education level. Figure E.5 summarizes the decomposition of the total effect of been-unemployed life event according to the current activity status.

Table E.1: Effect of life events on values

	Linear regression - OLS					
	GirlFirst		GotCancer		BeenUnemp	
	(Cons)	(Coll)	(Cons)	(Coll)	(Cons)	(Coll)
Intercept	0.32^{***}	-0.15^{***}	0.27^{***}	-0.07^{***}	0.26^{***}	-0.11^{***}
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Female	-0.19^{***}	0.07^{***}	-0.17^{***}	0.02	-0.17^{***}	0.03^{***}
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Educ. Secondary	-0.29^{***}	-0.04^{**}	-0.28^{***}	-0.03^{**}	-0.28^{***}	-0.03^{**}
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Educ. Tertiary	-0.52^{***}	-0.04^{**}	-0.50^{***}	-0.03^{**}	-0.50^{***}	-0.03^{***}
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Life event	0.03^{**}	0.00	0.09^{***}	0.02	0.02^{*}	0.18^{***}
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)
Value_{t-1}	0.54^{***}	0.49^{***}	0.56^{***}	0.50^{***}	0.56^{***}	0.49^{***}
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.37	0.26	0.39	0.27	0.39	0.27
Adj. R^2	0.37	0.26	0.39	0.27	0.39	0.27
Num. obs.	23354	23354	32885	32885	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Male in the NCDS cohort in his forties with primary education as the reference group. GirlFirst and GotCancer are the life events. In GirlFirst regressions, parents who have had a boy as a first child are the reference group. In GotCancer regressions, individuals who never had a cancer are the reference group. In BeenUnemp, individuals who have never been unemployed are the reference group. Table 3 in the paper summarizes the coefficients.

Table E.2: IV Estimate of the spillover effect

	IV regression - 2SLS			
	GirlFirst		GotCancer	
	(Cons)	(Coll)	(Cons)	(Coll)
Intercept	0.32^{***}	0.07^{***}	0.27^{***}	0.10^{***}
	(0.02)	(0.02)	(0.01)	(0.01)
Female	-0.19^{***}	-0.02^{**}	-0.17^{***}	-0.06^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
Educ. Secondary	-0.29^{***}	-0.18^{***}	-0.28^{***}	-0.19^{***}
	(0.02)	(0.02)	(0.01)	(0.01)
Educ. Tertiary	-0.52^{***}	-0.33^{***}	-0.50^{***}	-0.36^{***}
	(0.02)	(0.02)	(0.01)	(0.01)
Life event	0.03^{**}		0.09^{***}	
	(0.01)		(0.03)	
$\widehat{\text{Cons}}_t$		-0.32^{***}		-0.34^{***}
		(0.01)		(0.01)
Value_{t-1}	0.54^{***}	0.48^{***}	0.56^{***}	0.49^{***}
	(0.01)	(0.01)	(0.00)	(0.00)
R^2	0.37	0.30	0.39	0.31
Adj. R^2	0.37	0.30	0.39	0.31
Num. obs.	23354	23354	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables include gender, education (primary, secondary, tertiary), cohort fixed effects and period fixed effects. Male in the NCDS cohort in his forties with primary education as the reference group. GirlFirst and GotCancer are the life events. In GirlFirst regressions, parents who have had a boy as a first child are the reference group. In GotCancer regressions, individuals who never had a cancer are the reference group. Table 5 in the paper summarizes the coefficients.

Table E.3: IV Estimate of the group membership (GirlFirst)

	IV regression - GirlFirst - Multinomial logit - Dep. var.: Vote				
	(Con)	(Grn)	(Lab)	(LD)	(UKIP)
Intercept	-1.41^{***}	-3.58^{***}	-1.10^{***}	-1.98^{***}	-5.08
	(0.04)	(0.14)	(0.04)	(0.05)	(3.22)
Female	-0.15^{***}	0.04	-0.04	-0.02	-0.27^{**}
	(0.04)	(0.15)	(0.04)	(0.05)	(0.12)
Educ. Secondary	0.56^{***}	0.35^{*}	0.09^{*}	0.55^{***}	0.08
	(0.05)	(0.20)	(0.05)	(0.07)	(0.16)
Educ. Tertiary	0.78^{***}	0.62^{***}	0.36^{***}	0.94^{***}	-0.22
	(0.06)	(0.19)	(0.06)	(0.07)	(0.20)
$\widehat{\text{Cons}}_t$	0.01	-0.85^{***}	-0.27^{***}	-0.34^{***}	0.18^{*}
	(0.03)	(0.10)	(0.03)	(0.04)	(0.09)
Con Vote$_{t-1}$	2.56^{***}	0.13	0.46^{***}	0.91^{***}	1.27^{***}
	(0.05)	(0.27)	(0.06)	(0.08)	(0.18)
Grn Vote$_{t-1}$	0.63^{*}	3.75^{***}	0.77^{**}	1.59^{***}	0.49
	(0.33)	(0.31)	(0.35)	(0.31)	(1.03)
Lab Vote$_{t-1}$	0.50^{***}	0.81^{***}	2.19^{***}	1.01^{***}	1.14^{***}
	(0.06)	(0.18)	(0.05)	(0.07)	(0.15)
LD Vote$_{t-1}$	1.06^{***}	1.02^{***}	1.08^{***}	2.73^{***}	1.71^{***}
	(0.08)	(0.25)	(0.08)	(0.08)	(0.20)
UKIP Vote$_{t-1}$	1.57^{***}	1.46	-0.02	1.21^{**}	3.25^{***}
	(0.38)	(1.06)	(0.66)	(0.50)	(0.49)
Num. obs.	23354	23354	23354	23354	23354

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables include gender, education (primary, secondary, tertiary), cohort fixed effects and period fixed effects. Male in the NCDS cohort in his forties with primary education as the reference group. GirlFirst and GotCancer are the life events. Parents who have had a boy as a first child are the reference group. The baseline outcome of the multinomial logistic regression is the vote for Other (encompassing all other parties, blank votes and abstention). Vote$_{t-1}$ corresponds to the effect of having voted for the corresponding party in the previous period. Table 6 in the paper summarizes the coefficients.

Table E.4: IV Estimate of the group membership (GotCancer)

	IV regression - GotCancer - Multinomial logit - Dep. var.: Vote				
	(Con)	(Grn)	(Lab)	(LD)	(UKIP)
Intercept	-1.43^{***}	-3.47^{***}	-1.19^{***}	-1.97^{***}	-5.49
	(0.03)	(0.10)	(0.03)	(0.04)	(11.53)
Female	-0.09^{***}	0.08	0.03	0.06	-0.28^{***}
	(0.03)	(0.11)	(0.03)	(0.04)	(0.10)
Educ. Secondary	0.58^{***}	0.23	0.09^{**}	0.50^{***}	0.06
	(0.04)	(0.16)	(0.04)	(0.06)	(0.13)
Educ. Tertiary	0.74^{***}	0.65^{***}	0.36^{***}	0.88^{***}	-0.22
	(0.05)	(0.14)	(0.04)	(0.06)	(0.16)
$\widehat{\text{Cons}}_t$	0.08^{***}	-0.67^{***}	-0.24^{***}	-0.32^{***}	0.19^{**}
	(0.03)	(0.07)	(0.02)	(0.03)	(0.07)
Con Vote$_{t-1}$	2.56^{***}	0.09	0.47^{***}	0.82^{***}	1.22^{***}
	(0.04)	(0.21)	(0.05)	(0.07)	(0.15)
Grn Vote$_{t-1}$	0.29	3.31^{***}	0.36	1.24^{***}	1.28^{***}
	(0.25)	(0.23)	(0.27)	(0.23)	(0.48)
Lab Vote$_{t-1}$	0.41^{***}	0.73^{***}	2.21^{***}	0.99^{***}	0.87^{***}
	(0.05)	(0.14)	(0.04)	(0.06)	(0.13)
LD Vote$_{t-1}$	1.00^{***}	1.17^{***}	1.11^{***}	2.71^{***}	1.54^{***}
	(0.07)	(0.18)	(0.06)	(0.06)	(0.16)
UKIP Vote$_{t-1}$	1.46^{***}	1.60^{**}	-0.03	1.28^{***}	3.06^{***}
	(0.32)	(0.77)	(0.57)	(0.41)	(0.42)
Num. obs.	32885	32885	32885	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables include gender, education (primary, secondary, tertiary), cohort fixed effects and period fixed effects. Male in the NCDS cohort in his forties with primary education as the reference group. GirlFirst and GotCancer are the life events. Individuals who never had a cancer are the reference group. The baseline outcome of the multinomial logistic regression is the vote for Other (encompassing all other parties, blank votes and abstention). Vote$_{t-1}$ corresponds to the effect of having voted for the corresponding party in the previous period. Table 6 in the paper summarizes the coefficients.

Table E.5: SEM Estimate of the spillover effects (GirlFirst)

	2SLS regression			
	Reduced form (Stage 1)		Structural form (Stage 2)	
	(Cons)	(Coll)	(Cons)	(Coll)
GirlFirst	0.03^{***}	0.00	0.03^{***}	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Cons_{t-1}	0.55^{***}	-0.17^{***}	0.62^{***}	
	(0.01)	(0.01)	(0.01)	
Coll_{t-1}	0.19^{***}	0.48^{***}		0.54^{***}
	(0.01)	(0.01)		(0.01)
$\widehat{\text{Cons}}_t$				-0.31^{***}
				(0.01)
$\widehat{\text{Coll}}_t$			0.39^{***}	
			(0.01)	
R^2	0.40	0.30	0.40	0.30
Adj. R^2	0.40	0.30	0.40	0.30
Num. obs.	23354	23354	23354	23354

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables in all regressions include cohort, period, gender and education.

Table E.6: SEM Estimate of the spillover effects (GotCancer)

	2SLS regression			
	Reduced form (Stage 1)		Structural form (Stage 2)	
	(Cons)	(Coll)	(Cons)	(Coll)
GotCancer	0.07^{**}	0.03	0.06^{*}	0.05^{*}
	(0.03)	(0.03)	(0.03)	(0.03)
Cons_{t-1}	0.57^{***}	-0.19^{***}	0.64^{***}	
	(0.00)	(0.00)	(0.00)	
Coll_{t-1}	0.18^{***}	0.49^{***}		0.55^{***}
	(0.00)	(0.00)		(0.00)
$\widehat{\text{Cons}}_t$				-0.34^{***}
				(0.01)
$\widehat{\text{Coll}}_t$			0.37^{***}	
			(0.01)	
R^2	0.42	0.31	0.42	0.31
Adj. R^2	0.42	0.31	0.42	0.31
Num. obs.	32885	32885	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables in all regressions include cohort, period, gender and education.

Table E.7: SEM Estimate of the spillover effects (BeenUnemp)

	2SLS regression			
	Reduced form (Stage 1)		Structural form (Stage 2)	
	(Cons)	(Coll)	(Cons)	(Coll)
BeenUnemp	-0.03^{***}	0.14^{***}	-0.08^{***}	0.12^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
Cons_{t-1}	0.57^{***}	-0.19^{***}	0.64^{***}	
	(0.00)	(0.00)	(0.00)	
Coll_{t-1}	0.18^{***}	0.48^{***}		0.54^{***}
	(0.00)	(0.00)		(0.00)
$\widehat{\text{Cons}}_t$				-0.33^{***}
				(0.01)
$\widehat{\text{Coll}}_t$			0.37^{***}	
			(0.01)	
R^2	0.42	0.31	0.42	0.31
Adj. R^2	0.42	0.31	0.42	0.31
Num. obs.	32885	32885	32885	32885

Notes: $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Standard errors between parentheses. Control variables in all regressions include cohort, period, gender and education.

Table E.8: Decomposition of the effect of GirlFirst on values

	Direct and indirect effects		Total effect
Value (v)	$\tilde{\gamma}_v^{Cons} \times \theta_{Cons}$	$\tilde{\gamma}_v^{Coll} \times \theta_{Coll}$	ϕ_v
Conservatism ($Cons$)	**0.030**	0.004	0.035
	(100.0)	(13.9)	(113.9)
Collectivism ($Coll$)	-0.010	**0.011**	0.001
	(-88.2)	**(100.0)**	(11.8)

Notes: Magnitudes in standard deviations. Direct effects in bold. Relative share with respect to the direct effect in percent between parentheses.

Table E.9: Decomposition of the effect of GotCancer on values

	Direct and indirect effects		Total effect
Value (v)	$\tilde{\gamma}_v^{Cons} \times \theta_{Cons}$	$\tilde{\gamma}_v^{Coll} \times \theta_{Coll}$	ϕ_v
Conservatism ($Cons$)	**0.052**	0.017	0.069
	(100.0)	(32.5)	(132.5)
Collectivism ($Coll$)	-0.018	**0.046**	0.029
	(-38.1)	**(100.0)**	(61.9)

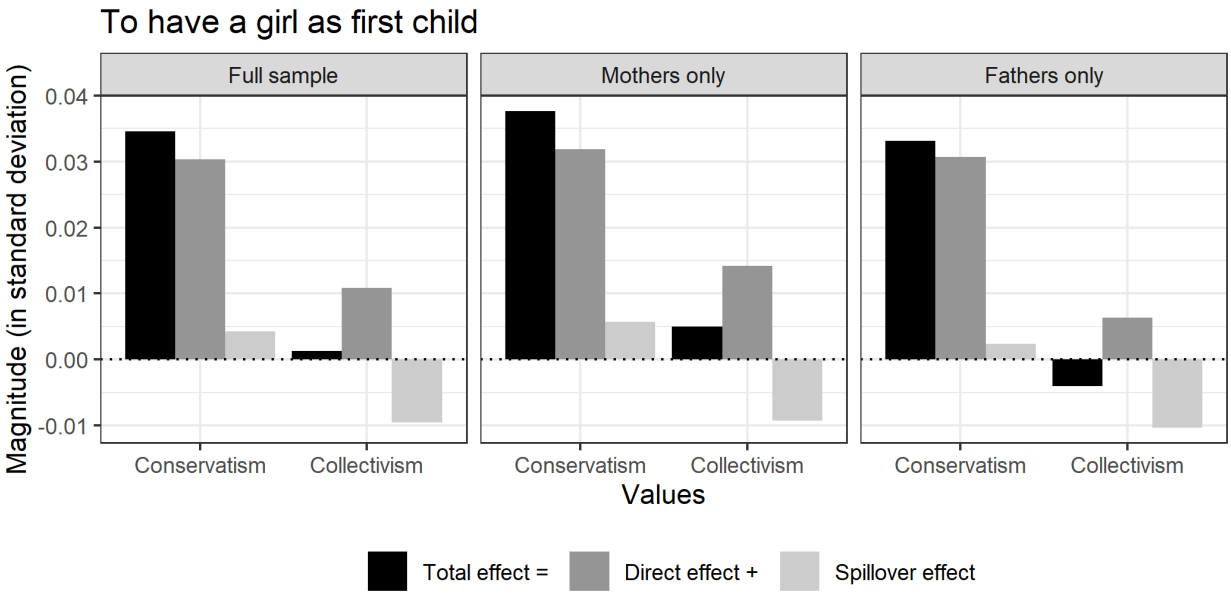
Notes: Magnitudes in standard deviations. Direct effects in bold. Relative share with respect to the direct effect in percent between parentheses.

Table E.10: Decomposition of the effect of BeenUnemp on values

	Direct and indirect effects		Total effect
Value (v)	$\tilde{\gamma}_v^{Cons} \times \theta_{Cons}$	$\tilde{\gamma}_v^{Coll} \times \theta_{Coll}$	ϕ_v
Conservatism ($Cons$)	**-0.073**	0.042	-0.031
	(100.0)	(-57.2)	(42.8)
Collectivism ($Coll$)	0.024	**0.111**	0.135
	(21.7)	**(100.0)**	(121.7)

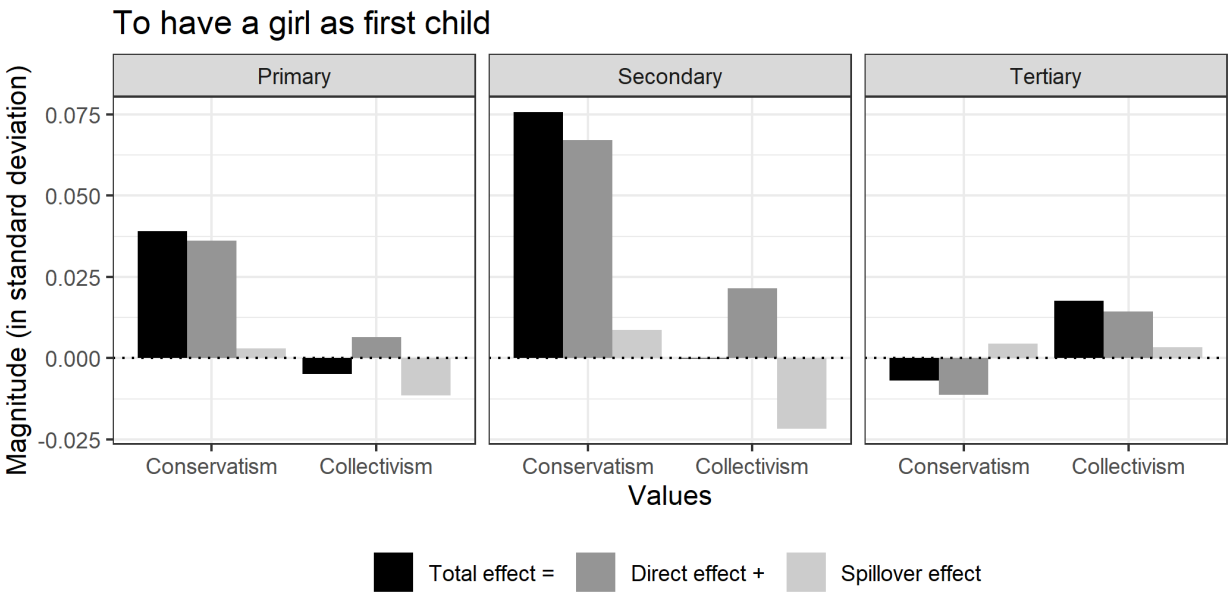
Notes: Magnitudes in standard deviations. Direct effects in bold. Relative share with respect to the direct effect in percent between parentheses.

Figure E.1: Decomposition of the effect of GirlFirst by parent



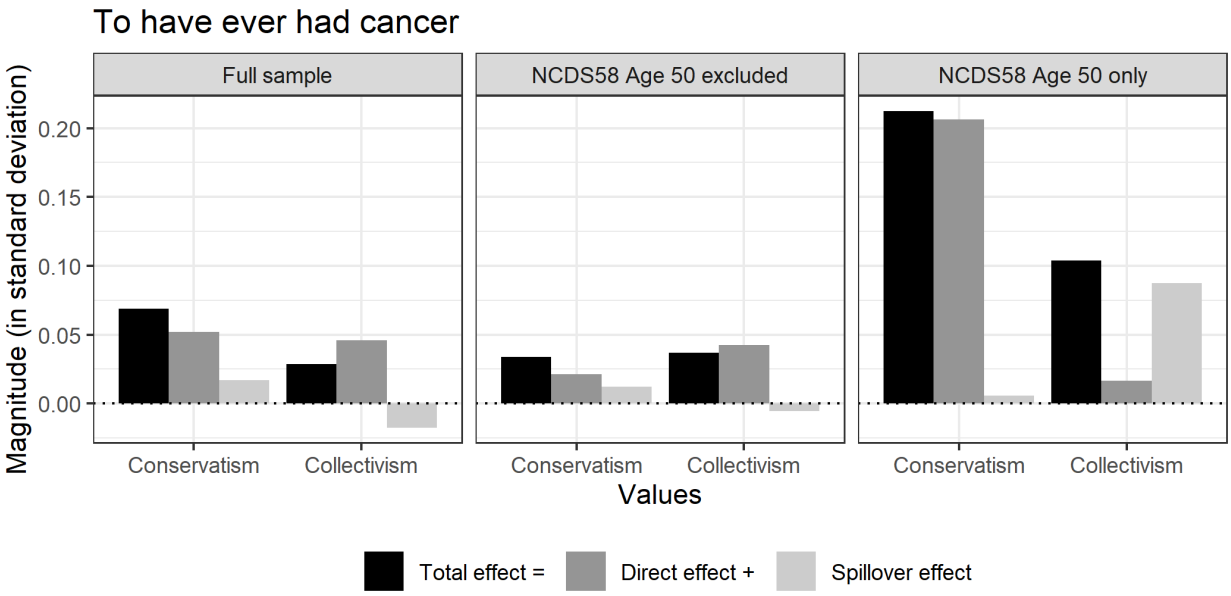
Notes: This figure presents the decomposition of the total effect of the girl-first life event on both values, Conservation and Collectivism, according to the parent. The magnitude of each effect is expressed in standard deviation.

Figure E.2: Decomposition of the effect of GirlFirst by education



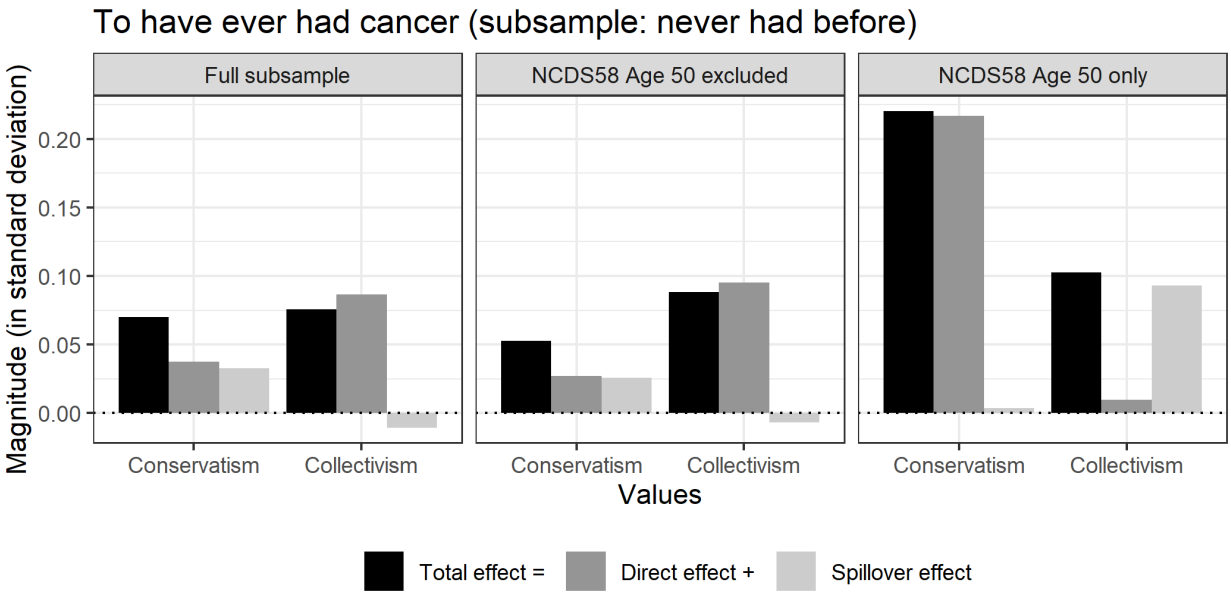
Notes: This figure presents the decomposition of the total effect of the girl-first life event on both values, Conservation and Collectivism, according to education. The magnitude of each effect is expressed in standard deviation.

Figure E.3: Decomposition of the effect of GotCancer with and without the NCDS58 Age 50



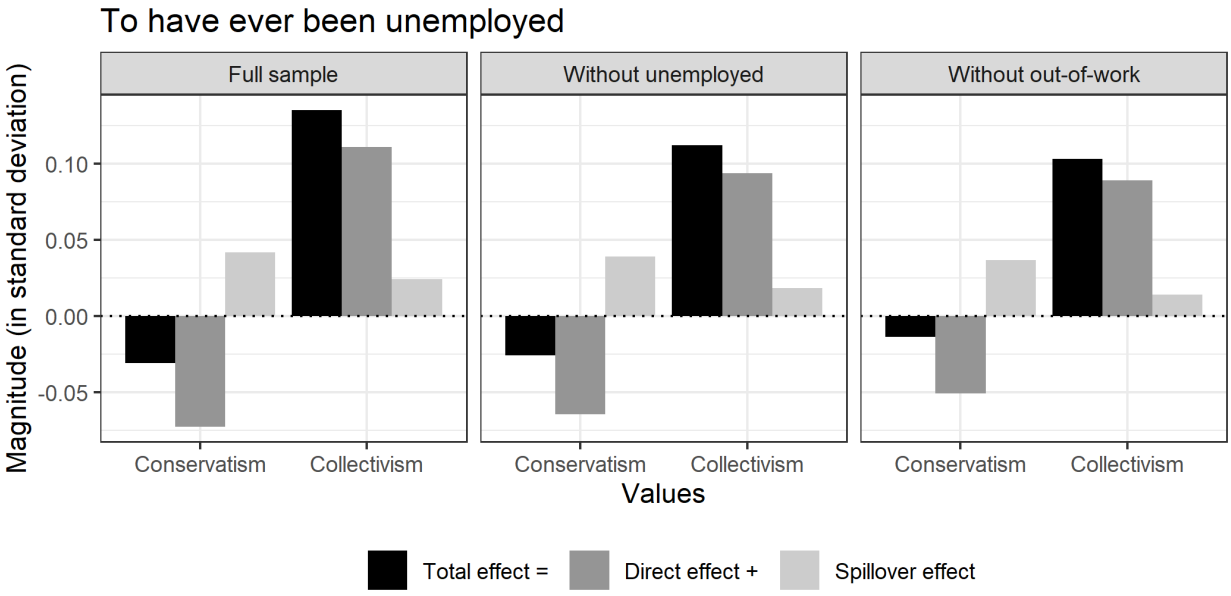
Notes: This figure presents the decomposition of the total effect of the got-cancer life event on both values, Conservation and Collectivism, for the NCDS58 cohort at age 50 only and without them. The magnitude of each effect is expressed in standard deviation.

Figure E.4: Decomposition of the effect of GotCancer for those who never have had cancer before



Notes: This figure presents the decomposition of the total effect of the got-cancer life event on both values, Conservation and Collectivism, for the NCDS58 cohort at age 50 only and without them. The magnitude of each effect is expressed in standard deviation.

Figure E.5: Decomposition of the effect of BeenUnemp by current activity status



Notes: This figure presents the decomposition of the total effect of the been-unemployed life event on both values, Conservation and Collectivism, according to the current activity status. The magnitude of each effect is expressed in standard deviation.

F Extension of the theoretical framework

To quantify the effect of life events on values, we compare two individuals based on their life trajectories and values using the theoretical framework presented in Section 2. Suppose there exist two individuals i and j that are identical except in their initial value a_0, with $a_0^j > a_0^i$. Both individuals belong to the group s_1. Let $\pi_t = \pi(a_t)$ be the probability that a life event occurs which is endogenous to the value a.

Suppose the information shock Δa_0—due to the life event—has the same magnitude for both individuals and would be sufficiently large such that both individuals would identify to the other group. The expected values a_1 and b_1 for the individual j are

$$\mathbb{E}(a_1^j) = \frac{\eta_a a_0^j + \phi_a \bar{a}_1}{\eta_a + \phi_a} + \pi(a_0^j)\left[\frac{\eta_a \Delta a_0 + \phi_a(\bar{a}_2 - \bar{a}_1)}{\eta_a + \phi_a}\right], \tag{19}$$

$$\mathbb{E}(b_1^j) = \frac{\eta_b b_0^j + \phi_b \bar{b}_1}{\eta_b + \phi_b} + \pi(a_0^j)\frac{\phi_b(\bar{b}_2 - \bar{b}_1)}{\eta_b + \phi_b}, \tag{20}$$

where $\mathbb{E}$ is the expectation operator. It is straightforward to show that these values are symmetrical for the individual i. Hence, the biases due to the endogeneity of values can be written as

$$\mathbb{E}(a_1^j) - a_1^j = \pi(a_0^j) \times \Delta A, \tag{21}$$

$$\mathbb{E}(b_1^j) - b_1^j = \pi(a_0^j) \times \Delta B, \tag{22}$$

where $\Delta A \equiv \frac{\eta_a \Delta a_0 + \phi_a(\bar{a}_2 - \bar{a}_1)}{\eta_a + \phi_a}$ is the direct effect of the life changing event on value a, and $\Delta B \equiv \frac{\phi_b(\bar{b}_2 - \bar{b}_1)}{\eta_b + \phi_b}$ is the spillover effect of the life event on value b.

Let $\Delta\mathbb{E}v_t$ be the difference in expected value v_t with respect to the true difference between both individuals, namely,

$$\Delta\mathbb{E}v_t \equiv \mathbb{E}(v_t^j) - \mathbb{E}(v_t^i) - (v_t^j - v_t^i) \tag{23}$$

Thus,

$$\Delta\mathbb{E}a_1 = \left[\pi(a_0^j) - \pi(a_0^i)\right] \times \Delta A, \tag{24}$$

$$\Delta\mathbb{E}b_1 = \left[\pi(a_0^j) - \pi(a_0^i)\right] \times \Delta B, \tag{25}$$

When the probability that the life event occurs is exogenous to values, i.e. $\pi(a_0^j) = \pi(a_0^i)$, there is no bias when estimating the difference between both individuals. However, in many cases such as unemployment, this probability is likely to be endogenous, i.e. $\pi(a_0^j) \neq \pi(a_0^i)$, which leads to a bias when gauging the effect of a life event on values.

Table F.1: Endogeneity bias

	$\beta_a = \log(2)$						
a_0^j	-2	-1	-0.5	0	0.5	1	2
a_0^i	2	1	0.5	0	-0.5	-1	-2
$\pi(a_0^j)$	0.2	0.33	0.41	0.5	0.59	0.66	0.8
$\pi(a_0^i)$	0.8	0.66	0.59	0.5	0.41	0.33	0.2
$\Delta\pi$	-0.6	-0.33	-0.17	0	0.17	0.33	0.6

Notes: This table presents the magnitude of the endogeneity bias due to the difference in initial value a between two individuals. $\pi(a_0, \beta_a)$ corresponds to the probability derived from the binomial logistic function and $\Delta\pi$ to the difference in probabilities between both individuals.

The magnitude of the bias depends on two components: the difference in terms of probabilities that captures the degree of endogeneity of the life event with respect to values; and the magnitude of either the direct effect or the spillover effect. Although the endogeneity issue affects the magnitude of the total effect, it does not change the relative shares of the direct and spillover effects because it is a scale factor of the total effect.

In order to evaluate the magnitude of the bias, I assume that the probability $\pi(a_t)$ is an increasing function of a_t. The individual j is more likely to face the life event since $a_0^j > a_0^i$. For simplicity, let assume a binomial logistic function such that

$$\pi(a_0, \beta_a) = \frac{e^{\beta_a a_0}}{1 + e^{\beta_a a_0}}. \tag{26}$$

Note that the intercept has been omitted. Suppose a large endogeneity, namely, that the advantage in terms of the probability that the life event occurs given by a higher value a has an odd-ratio about 2, which means that an individual with a one-standard-deviation increase in a_0 would be two times more likely that the life event occurs. As β_a corresponds to the log-odd ratio, it implies that $\beta_a = \log(2)$.

Table F.1 summarizes the size of the bias according to the gap in initial values between both individuals. Since $|\Delta\pi| < 1$, it implies that the endogeneity bias does not change the sign of the direct and indirect effects. The (2, -2) and (-2, 2) scenarii are extreme cases in which there is a high degree of polarization in terms of values such that both groups have respectively 2 and -2 standard deviations on average while the average value in the population remains 0. Even in those extreme cases, both the direct and spillover effects can be biased by at the most a scale factor of plus or minus 0.6.