ORA *Full* Proposal Template
Call 2017/2018

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I. PROJECT IDENTIFICATION

Project Acronym: DICE
Project Title: The *D*evelopment of *I*nequalities in *C*hild *E*ducational Achievement: A Six Country Study
Main Applicant: Dr Elizabeth Washbrook (University of Bristol)

Main discipline for this proposal and other contributory disciplines, if applicable:

> Sociology, Demography, Education, Public Policy

Keywords (max. 8 separated by a semicolon ";")

> Child development; Socioeconomic inequality; Longitudinal trajectories; Cross-national comparisons

Please specify the date on which the project is intended to begin. Implementation of the research project must start within nine months of the date of the award letter.

Duration (24 to 36 months): 36 months   to begin on (date): 1 Jan 2019

Abstract (up to 1500 characters, spaces included):

> This project aims to advance our understanding of disparities in child development by parental socioeconomic status (SES). It leverages rich cohort and administrative data from six countries - France, Germany, Japan, Netherlands, the United Kingdom, and the United States – embedding them in a harmonized framework. The project moves beyond cross-sectional and single country snapshots by studying the question of how inequalities develop over time (ages 3 to 16), what factors may influence inequalities and how national context may strengthen or buffer these processes. Child development is conceptualised broadly, to include cognitive, social/emotional and health outcomes, recognizing the interplay of multiple spheres of development in childhood. The specific aims of the project are: 1) to provide new evidence on the extent and sources of inequalities in early childhood and at the start of school, in particular on the role of parenting/home environment and preschool; 2) to describe trajectories of child development, and identify factors such as parental involvement and parent-school interactions that reduce/increase inequalities as children move through primary school; and 3) to describe inequalities at the start of secondary school and analyze trajectories of development, and factors such as school type and tracking that reduce/increase inequalities, as children move through secondary school; allowing throughout for heterogeneous effects across the ability distribution.

II. FULL LIST OF PROJECT PARTICIPANTS

(Principal investigators: PIs, Co-Investigators: CIs, Team Members: TMs, in all contributing countries. For definitions see Call text section III.3 "Guidelines for Full Proposals")

For every single project participant, please fill in the tables below. Add lines as necessary and if relevant, please group participants in teams. In the "position" column, please specify the duration of the contract, if on a fixed-term contract)

France

Role	Name & First Name	Organisation	Laboratory or Unit[1]	Email Address	Average time spent on project in hours per week	Position (*Emploi actuel et statut : CDD, CDI…*)
PI	Solaz, Anne	Ined	Economic demography and Families research units	solaz@ined.fr	5 hours	Directrice de recherche, fonctionnaire titulaire
TM	Panico, Lidia	Ined	Economic demography and Families research units	Lidia.panico @ined.fr	5 hours	Chargée de recherche, fonctionnaire titulaire
TM	N.N.	Ined	Economic demography and Families research units	-	26.7 hours (40h/w for 2 years)	Post-doctoral researcher
TM	N.N.	Ined	Economic demography and Families research units	-	26.7 hours (40h/w for 2 years)	Data manager

Germany

Role	Name & First Name	Research Organisation	Department, Institute or Centre	Email Address	Average time spent on project in hours per week	Position
PI	Schneider, Thorsten	University of Leipzig	Institute of Sociology	thorsten.schn eider@uni-leipzig.de	5 hours	Professor
Co-I	Weinert, Sabine	University of Bamberg	Institute of Psychology	sabine.weine rt@uni-bamberg.de	3 hours	Full Professor Development al Psychology
TM	N.N.	University of Leipzig	Institute of Sociology	-	36.7 hours (30h/w Year 1; 40h/w Years 2-3)	Post-doctoral researcher
TM	N.N.	University of Leipzig	Institute of Sociology	-	5 hours	Student assistant

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[1] (for public research organizations only)

TM	N.N.	University of Bamberg	Institute of Psychology	-	10 hours (30h/w Year 1 only)	Post-doctoral researcher
TM	N.N.	University of Bamberg	Institute of Psychology	-	1.7 hours (5h/w Year 1 only)	Student assistant

The Netherlands

Role	Name & First Name	Research Organisation	Department or Institute	Email Address	Average time spent on project in hours per week	Position *(functie en duur aanstelling)*
PI	Keizer, Renske	Erasmus University of Rotterdam (EUR)	Department of Public Administration and Sociology	keizer@essb.eur.nl	8 hours	Full Professor Family Sociology
TM	N.N.	Erasmus University of Rotterdam (EUR)	Department of Sociology	-	28 hours	Post-doctoral researcher

United Kingdom

Role	Name & First Name	Research Organisation	Department, Institute or Centre	Email Address	Average time spent on project in hours per week	Position
PI	Washbrook, Elizabeth	University of Bristol	Graduate School of Education	Liz.washbrook@bristol.ac.uk	5.6 hours	Senior Lecturer Quantitative Methods
Co-I	Waldfogel, Jane	Columbia University	Columbia University School of Social Work	J.Waldfogel@columbia.edu	4 hours	Compton Foundation Centennial Professor for Prevention of Children & Youth Problems
TM	N.N	University of Bristol	Graduate School of Education	-	18.8 hours	Researcher
TM	N.N	Columbia University	Columbia University School of Social Work	-	20 hours	Graduate Research Assistant

Japanese Associate Partner

Tick this box if the proposal has a Japanese associate partner, who applied separately to JSPS for funding (see the annex to this form, describing the Japanese team and component of the proposed research).

X

Cooperation Partners:

Please mention those scientists from countries not participating in ORA and non-academic partners with whom you are cooperating or have agreed to cooperate on this particular project (name and institution). Please note that no funding can be requested for Cooperation Partners.

These partners should provide their own funding. Please mention the indicative percentage of working time spent on this project.

Name and Title	University/Institute/Organisation	Percentage of Working Time (indicative)	Source of Funding

III. RESEARCH DESCRIPTION

Please describe the project proposal in detail in <u>up to 10 pages</u> (excluding the bibliography and the justification of resources). Please refer to the Call text (Section III.3 "Guidelines for Full Proposals") for more information about the structure below.

1 Aims and background of the research proposed

2 Position in the context of existing research

3 Theoretical foundations and methodology of the research proposed

4 Added value of international collaboration and contribution of the partners

5 Work plan

6 Expected output / impact and dissemination (both academic and non-academic)

7 Ethics

8 Data management plan

The *D*evelopment of *I*nequalities in *C*hild *E*ducational Achievement (*DICE*): A Six Country Study

1. Aims and background of the research proposal

Inequalities in child development by parental socioeconomic status (SES) are a direct impediment to social mobility and life chances and hence are a concern across OECD countries. This project aims to advance understanding of SES disparities in child development by leveraging detailed cohort and administrative data from six rich countries - France, Germany, Japan, Netherlands, the UK, and the US -- that are similar enough to form valid comparisons, but also sufficiently different to allow us to learn about the role of context in the development of inequalities. Because different aspects of development matter, and may be differentially affected by SES and by country contexts, we conceptualize child development broadly, to include cognitive development (language/literacy and maths skills, school achievement) and also social/emotional development (attention skills, behaviour problems) and health (overall health, obesity). The novel features of the project are to move beyond cross-sectional and single country snapshots and to embed examination of multiple developmental stages, multiple outcomes, and multiple countries in a highly harmonized framework. We aim to provide new evidence on the dynamics of inequalities in childhood and adolescence, what factors influence them, and how national contexts strengthen or buffer these processes.

The specific aims of this project are: 1) to provide new evidence on the extent and sources of inequalities in multiple dimensions of child development in early childhood and at the start of school, including in particular the role of parenting/home environment and preschool; 2) to describe trajectories of child development, and identify factors such as parental involvement and parent-school interactions that reduce/increase inequalities, as children move through primary school; and 3) to describe inequalities at the start of secondary school and analyze trajectories of development, and key factors such as secondary school type and tracking that reduce/increase inequalities, as children move through secondary school, for children overall and for those at different points in the achievement distribution.

Data from international large-scale assessments (ILSAs) (e.g. PISA, PIRLS, TIMSS) that take a snapshot of children's achievement at a point in time have shown that SES disparities are pervasive (OECD 2013), feeding into widespread concern about the transmission of advantage/disadvantage across generations (Corak 2013). But there is also considerable variation across countries, from which we can learn. According to PISA 2015, which ranked 35 countries based on the reading test score gap between the top and bottom quartiles of their SES index, our countries ranged from Japan (least unequal, at 14); Netherlands (16); UK (17); US (20); Germany (22); France (most unequal, at 33). While many explanations for this cross-national variation have been proposed, there are serious limitations to what one can learn from the ILSAs about underlying processes, limitations we aim to address in this project.

One key question concerns the timing of inequalities over the lifecycle. The ILSAs are cross-sectional and cannot track skill development over time. Moreover, there is no ILSA of children before 4th grade, yet we know that skills development is at its fastest in early life. So it is only by harmonizing cohort and administrative data across countries, as we propose here, that we can gain insight into when and where trajectories from the earliest childhood period diverge for children from different SES backgrounds and how these processes vary by country context. A second crucial question concerns inequalities in social/emotional development and health. The cognitive skills that are the primary focus of ILSAs such as PISA are critical for children's life chances, but are not the only ones. Moreover, inequalities in social/emotional development and health may themselves contribute to inequalities in cognitive development and achievement. For this reason, we will utilize rich child cohort data to study child development broadly defined. A third important question has to do with the factors that reduce or increase inequalities. The datasets we propose to use contain far more detailed (and time-varying) information than the ILSAs on home inputs including demographics and parenting/home environments. We will use these data to understand how crucial family inputs, and school inputs, vary across countries and over the lifecycle and whether their impacts on inequalities in child outcomes are greater/lesser in certain national contexts. The considerable variation in policy contexts offered by our countries (e.g. parental leave; pre-school; primary school start age, curriculum; private schools, tutoring; tracking) will enable us to provide new knowledge on whether the factors associated with developing inequalities are context-dependent.

2. Position in the context of existing research

The comparative study of inequalities has attracted a great deal of interest from social scientists (e.g. Ermisch et al. 2012). With its focus on trajectories over the early stages of the life course, this project builds on the cross-country analyses of inequalities in child development by Waldfogel, Washbrook and colleagues. Most recently, the investigators utilized harmonized data from cohort studies in Anglo-Saxon countries and showed that inequalities in cognitive development at age 5, 7/9, and 11 between children of low vs. high SES parents are largest in the US, followed by the UK, and significantly smaller in Canada and Australia (Bradbury et al. 2015). This project will substantially add to that work in several respects. We will include a broader range of countries/collaborators, including countries that offer interesting variation in inequalities and contexts but have been previously less explored in this

literature. We will include a broader range of ages, covering children from age 3 to 16, and will focus more explicitly on trajectories of inequalities in both primary and secondary school. We will go beyond cognitive skills and school achievement, to consider the evolution of inequalities in social/emotional development and health. And we will formally incorporate demographic, parenting/home environment, and preschool, school, and policy contextual variables into the models so that the explanatory power of different factors can be quantified.

A further contribution of this project is its distributional focus. Most prior research, including our own, examines mean differences between SES groups, but mean differences can disguise large variation in SES disparities at different points in the achievement distribution (Jerrim 2012). The explanations and potential policy remedies for SES gaps will differ greatly depending on whether the gaps are larger for low- or high-achieving children. Hence, we will systematically consider how SES disparities vary over the achievement distribution.

Previous comparative work on educational inequalities tended to rely on cross-sectional ILSAs like PISA. One notable exception is the eduLIFE project, which harnessed cohort data across a number of countries to examine educational inequalities from childhood through to adulthood (EUI 2016). Our project focuses on the earlier stages of the life course (ages 3 to 16) in greater detail and, unlike eduLIFE, includes a major component on the primary school years, an important developmental stage when school policies and practices can be equalizing (Magnuson et al. 2012). We also take a highly harmonized approach that enables cross-country differences to be quantified precisely and we consider a broader set of outcomes. Adding social/emotional development and health to the study of educational inequalities builds on the growing recognition of the importance of so-called non-cognitive influences (e.g. Khine & Areepattamannil 2016) and the interactions between the cognitive and non-cognitive domains (Blair & Raver 2015).

3. Theoretical foundations and methodology for the work proposed

Our conceptual framework views human development as a dynamic process in which skills at age t depend on (a broad vector of) skills at age t-1, plus inputs experienced in the intervening period. It draws on the lifecycle model of human capital development proposed by Heckman and co-authors (Cunha et al. 2006), but also on ecological models of child development (Bronfenbrenner 1994). This latter framework emphasises that distal factors at the family, community and societal levels shape the environments experienced by children, which in turn affect their growth and development. This framework links children's skills, their immediate home and school environments, and the wider social, institutional and cultural influences on inequality emphasized in the sociology and policy literatures (Duncan and Murnane 2011; Kalil 2014; McLanahan 2004; Putnam 2015). We focus in particular on three types of inputs: family demographics (e.g. parental age, marital status, employment status, race, ethnicity, and/or immigration status, language spoken in the home); parenting and home environment (e.g. cognitively stimulating activities such as reading, learning items in the home such as books and computers, and other aspects of parenting such as warmth/harshness); and the preschool, school, and policy context (e.g. child care and preschool experiences, schooling parameters such as school type or tracking, and provision of various types of social welfare benefits). We select these because they have been shown to be consequential for children's development and because in most contexts they are graded by SES. The specific contextual factors we analyse will vary by age/developmental stage. In our analyses of early childhood and school entry, we will include detailed controls for parenting/home environment and child care/preschool (as well as family demographics). In our analyses of primary school, we will be particularly interested in parental involvement and interactions between parents and schools (along with other aspects of parenting/home environment and family demographics). When analysing secondary school, we will introduce relevant variables such as secondary school type and internal tracking (as well as family demographics and parenting/home environment).

In terms of methodology, we will document the unconditional SES gaps in both inputs and child outcomes across developmental stages and countries. We will then use regression-based models to explore how the unconditional SES gaps are explained by the introduction of different predictors. The role of specific factors in accounting for the overall gaps will be quantified via a decomposition technique (outlined in Washbrook et al. 2014; Waldfogel and Washbrook 2011). A key and novel feature of our approach is the emphasis on developing harmonized definitions of the constructs involved so that identical models can be applied across countries (Bradbury et al. 2015 discuss in detail the issues involved in harmonizing measures of early vocabulary, reading, maths and behaviour across multiple national cohort datasets.) This approach will allow us to systematically explore stability and difference across countries in the social grading and importance for skill development of different explanatory factors. In the analyses of trajectories, prior outcomes (e.g. achievement, social/emotional wellbeing, health, as relevant) will be included as predictors. This work will incorporate recent developments in adjusting for measurement error in initial test scores which has been shown to lead to biased estimates of SES divergence if not accounted for (Feinstein et al. 2015). We will explore directly whether trajectories diverge by SES for children with a common level of prior achievement. Standard regression techniques will also be contrasted with quantile regressions, to reveal whether SES gaps vary with achievement at age t, rather than t-1.

Missing data and attrition. The project is based on several high quality prospective cohorts that observe children from birth or from school entry. The initial samples are drawn either through a random sampling design or with an over-sampling of specific populations (such as those who are harder to reach and retain, for example, more disadvantaged groups). In all cases, a weighting system insures the representativeness of the samples at the national level. Despite the fact that our cohorts are of high quality, some crucial variables might be partially missing for some individuals. We will impute, as much as possible, values for missing variables, using information both on other covariates at the current wave and lagged values. For example, family income often has a high level of missingness, but is imputable from other covariates such as parental education, labour force status, and occupational class.

As in any prospective study, attrition may occur and is usually selective, concerning particular groups, such as the more disadvantaged, who are more likely to experience family transitions and residential moves. Although one cannot know with certainty the direction of the bias, if more disadvantaged households are lost to attrition, then our estimates of SES gradients in child outcomes are likely to be conservative (that is, we may underestimate the true effect of being in a low-SES household). Thus, we are unlikely to overestimate SES gradients. However, it is still important to address potential attrition bias. Survey weights take account of attrition and its potentially selective nature, thus we plan to systematically use weights in our analyses. We will also take additional steps to insure that analyses are not biased by attrition. Robustness checks of our results will be tested on different samples (e.g. children tested/surveyed in all waves, children with only one wave missing, children tested/surveyed only once). We will also test whether children lost to attrition had different initial outcomes than those interviewed in subsequent waves.

4. Added value of international collaboration and contribution of the partners

First, as discussed, this project requires longitudinal cohort data or administrative data. In some cases (e.g. secure access MCS data, UK), access to such data is restricted to investigators within the country; in other cases, access while not fully restricted is greatly facilitated if investigators are based at the institution that hosts the dataset (e.g. ELFE at INED, France). Second, this project requires the harmonization of an array of variables across countries. For this, detailed knowledge of the datasets and measures used in each country is critical. Third, to inform the analyses of factors influencing inequalities, the project requires substantive knowledge of each country's demographic and policy context, in particular with regard to preschool, primary school, and secondary school policies.

All the members of the team have experience and expertise in methods for analyzing longitudinal data. In addition, each partner contributes particular methodological and substantive expertise (see enclosed CVs). Keizer will provide leadership on parents' influence, in particular the role that fathers' involvement in parenting plays and the role that parents play in interaction with the schools. Panico is an expert on early childhood development and health and early inequalities. Schneider is an expert on stratification, in particular within the education system. Solaz will provide expertise on family structure and family change. Waldfogel will provide leadership on analyzing the influence of public policies and data harmonization. Washbrook will provide expertise on analyses of trajectories, quantile regression, and data harmonization. Weinert will provide expertise on child development, particularly in early childhood. (The contributions of the proposed Japan partners are summarized in the Japan annex).

5. Work plan

Our project will analyze inequalities in child development across six disparate country contexts, relying on an unprecedented array of extremely rich cohort and administrative data (listed in Table 1). Except where otherwise noted, all the sources are nationally representative, and all contain measures of SES (e.g. parental education, family income), child cognitive development, social/emotional development, and health, and key explanatory factors including demographics, parenting and the home environment, and preschool, school, and policy context. Except where otherwise noted, our primary measure of SES will be parental education, defined by the highest educated parent, and categorized as low, medium, or high (following the typology used by Bradbury et al. 2015). We will utilize the newest data releases as they come on-stream, providing the most up-to-date knowledge of contemporary cohorts possible.

The project consists of six sets of analyses (two per year), which build sequentially to advance our understanding of inequalities in child development across the six countries. The process of cross-national data harmonization will draw on the expertise developed by Waldfogel and Washbrook in previous projects, combined with detailed input from all team members. The entire team will meet twice a year in person and at least monthly over Skype. Results for each individual analysis will be coordinated and compiled by two specified team members.

In year 1, **Analysis 1** (led by Schneider & Washbrook) will benchmark inequalities across our six countries with ILSA data (at age 9 and 15). We begin by setting out what is known about inequalities in education in our countries from the most widely used data sources in comparative research. As discussed, our research questions cannot be addressed with these data, but this baseline study will allow us to make clear how our subsequent analyses refine, challenge or confirm previous cross-country findings. We will use data from PIRLS (reading at age 9), TIMSS (math at age 9), and PISA (reading and math at age 15) to describe the level, variability and equity of reading and

math skills at age 9 and 15 in our six countries, using the measure of SES provided within these datasets. By drawing on historical as well as contemporary data, this analysis will benchmark the degree of stability in SES gaps across cohorts within our countries over time. **Analysis 2** (led by Waldfogel & Weinert) will describe and explain early inequalities in cognitive development, social emotional development, and health (age 3-4). Cross-national evidence on inequalities in early childhood, before children start formal schooling, is extremely scarce, yet also critically important. An important first step in studying our six countries is to understand what inequalities in multiple aspects of development exist among young children and the explanatory power of different contextual factors and how these vary across countries. (Datasets to be used in this analysis and the subsequent ones are listed in Table 1).

In year 2, **Analysis 3** (led by Panico & Waldfogel) will provide evidence on inequalities at the start of school (age 5-7), another crucial developmental stage, given that Bradbury et al. (2015) showed that for the four countries analysed, over half of inequalities in secondary school were already present at school entry. **Analysis 4** (led by Keizer & Washbrook) will examine trajectories in inequalities in primary school (age 5-7 to 9-11). As children move through primary school, do inequalities widen or narrow, and what factors (in particular, parental involvement and parent/school interactions) are associated with different trajectories, and how do these differ across countries?

Table 1. Data Sources for Analyses 2 to 6

Country & Dataset	Cohort birth dates	Approx. baseline N	Follow-up ages	Used in Analyses:				
				2	**3**	**4**	**5**	**6**
France								
ELFE birth cohort	2011	18,000	0, 1, 2, 3, *5*	X	X			
DEPP panel	1996	15,000	6, 10		X	X	X	
DEPP panel	1993	35,000	11, 14				X	X
Germany								
NEPS SC 1	2012	3,500	0, 1, 2, *3, 4*	X				
NEPS SC 2	2005-2006	5,300	6-7, 7, 8, 9		X	X		
NEPS SC 3	1998-2000	3,800	10, 11, 12, 13, 14-15				X	X
United Kingdom								
MCS	2000-2002	18,800	0, 3, 5, 7, 11, 14, *16*[b]	X	X	X	X	X
LSYPE	1993-1994	15,800	11[b], 14, 15, 16					X
Netherlands								
Generation R	2002-2006	9,700	0-4[a], 6, 9, *13*	X	X	X	X	X
USA								
ECLS-B	2001	14,000	0, 2, 4, 5	X				
ECLS-K 2011	2004-2005	18,200	5, 6, 7, 8, 9, *10, 11*		X	X		
ECLS-K 1998	1992-1993	19,000	5, 6, 7, 9, 11, 14				X	X

Abbreviations: *ELFE* – French Longitudinal Study of Children; *DEPP* - La Direction de l'évaluation, de la prospective et de la performance; *NEPS SC* – National Education Panel Study, Starting Cohort; *MCS* – Millennium Cohort Study; *LSYPE* – Longitudinal Study of Young People in England; *ECLS-B (K)* – Early Childhood Longitudinal Study Birth (Kindergarten) Cohort. Data at follow-up ages shown in italics are due for release by 2020 at the latest (other data are already released). [a]Multiple survey waves in this age range. [b]Matched administrative child achievement data only.
Japanese data will be included in all analyses (see Annex for details), subject to the separate funding process.

In year 3, **Analysis 5** (led by Keizer & Solaz) will provide evidence on inequalities at the end of primary school (age 9-11). Here we will document inequalities, and the factors explaining them, at the time children finish primary school and transition into secondary school. **Analysis 6** (led by Solaz & Schneider) will examine trajectories in inequalities in secondary school (age 9-11 to 13-16). Do inequalities widen/narrow as children move through secondary school, do these patterns differ by group or country, and if so, what factors (in particular, school policies and home resources) are linked to widening/narrowing, and how do these vary across countries?

Each of these analyses will produce estimates not only for the overall population of children but also for key sub-groups, in particular, comparing results for children at different parts of the ability distribution using quantile regression. Where possible, as a robustness check, we will conduct supplemental analyses of children in urban areas (given that Generation R in the Netherlands covers an urban area only). Additionally, although our focus is on SES measured by parental education, we will test the robustness of our results to measuring SES with family income.

Data harmonization. In selecting specific datasets for each analysis, we recognize the need to balance two priorities: including the fullest possible range of country cases *and* including the most comparable contemporary

cohorts. For the most part, we place greater weight on including the broadest range of countries where at all possible, even if their cohorts are not exact contemporaries with those in the other countries. For example, as shown in Table 1, analysis 2 makes use of three cohorts born in the early to mid-2000s, and two born in 2011 and 2012. Similarly, the cohorts used in analysis 3 have birth dates ranging from the early 2000s to 2011, while the cohorts used in analysis 4 are mainly from the early to mid-2000s but with one from the mid-1990s. Because analyses 5 and 6 are for older children, they are of necessity focused on older cohorts, but again with some variation in birth timing (from the early 1990s to the early 2000s). We recognize that SES gaps for cohorts within countries might be affected by stage of the business cycle or other secular changes and will address potential within-country variation in two ways. First, where data on multiple cohorts exists within a country (as indicated in Table 1), we will use that data to analyze the stability of national SES gaps over time. Second, we will use the ILSAs (which have been administered to successive cohorts within countries over time) to benchmark the stability of SES gaps across cohorts within countries. Both these approaches will help us determine to what extent differences in period across cohorts/countries is a factor.

Parental education. Our core measure of SES is based on the highest educational qualification held by a parent co-resident with the child, used to divide families into three broad groups. The lowest education group contains parents with no qualification beyond the socially expected minimum (equivalent to a high school diploma in the US context). The highest education group contains those with at least a university bachelor's degree, leaving a middle residual group with intermediate qualifications. This approach has been used successfully in previous work (Bradbury et al. 2015) and preliminary work has already identified the appropriate definitions for the countries in this project.

Child outcome measures. The specific outcome measures from all twelve cohort surveys, spanning the four developmental stages, are listed in Table 2. In terms of the ***cognitive and educational domain***, our focus is on children's language/literacy, math and non-verbal outcomes measured directly using survey-administered instruments (most common at younger ages) or administrative standardized achievement tests (SATS; more common at older ages). To enable comparison across different instruments all measures will be standardized to mean zero unit variance z-scores. The implications of variance normalization will be explored using comparable estimates of national achievement variances from the ILSAs in Analysis 1 (as in Bradbury et al. 2015). Differences in measurement accuracy will be addressed by incorporating published measures of reliability (where available), detailed comparison of the underlying abilities targeted, and analyses of the sensitivity of the results to different assumptions about signal-to-noise ratios. In the ***social and emotional domain***, our primary measures are derived from detailed behavioural inventories, from which items will be organized into two broad domains. The first covers internalizing behaviours at younger ages and mental health symptoms such as anxiety and depression at older ages. The second covers externalizing behaviours and related measures of (lack of) attention and self-regulation. Although the surveys used several different behavioural inventories, items are often highly overlapping and drawn from the same sources, such as the Strengths and Difficulties Questionnaire and the Child Behaviour Checklist. Previous work by members of our group has shown that it is possible to select a set of harmonized items that capture common traits along the internalizing and externalizing dimensions in different surveys (Bradbury at al. 2015). In addition, from age 10 onwards we are able to compare inequalities in measures of children's self-concept. These outcomes will also be standardized and subject to the same sensitivity analyses outlined above. Finally, in the ***physical health domain*** we will use parental ratings of overall child health, indicators of chronic conditions, and body mass index (BMI) and overweight/obesity calculated from high-quality measures of height and weight available at all developmental stages.

Our analyses will proceed in stages. In the first, unconditional, stage, we will document the SES gaps in each outcome at the mean, and at different points in the achievement distribution using quantile regression (including controls for lagged outcome measures in the longitudinal Analyses 4 and 6). In the second stage, we then seek to elucidate the mechanisms that give rise to these gaps and that may differ in importance across countries.

Explanatory variables. Our surveys all contain exceptionally rich indicators of children's home and out-of-home environments and the task of harmonizing these will be a major component of the project. The named leads on each project analysis will be responsible for collating measures from all countries and producing common definitions. To date, we have identified a core set of family-level factors that are captured in all country surveys in all waves: ***mother's age at birth of child, family structure, number of siblings, parent is first-generation immigrant, language other than main national language spoken in home, total household income.*** These variables will form the basis of the first set of parsimonious, but highly comparable, regression decompositions. They will allow us to paint a consistent picture of the contribution of inequalities in parental demographic and financial resources to SES gaps across countries and developmental stages. Next, these core models will be supplemented with more detailed measures of children's environments that are specific to each developmental stage. We will estimate one set of models with controls available in all our countries, and supplemental models making use of additional variables available in at least 4 of our countries as a sensitivity check to see how our main results change with additional controls (see Table 3).

Table 2. Child outcome measures across domains and developmental stages

Domain	France	Germany	Netherlands	UK	US
AGE 3-4					
Early cognitive test batteries	BAS Picture Similarities	PPVT NEPS Maths test Executive Functions (Flanker) SON Non-verbal categorization test		BAS Naming Vocabulary Bracken School Readiness Assessment	ECLSB Early Literacy test ECLSB Early Maths test ECLSB Color Knowledge test
Parent report behavioural inventories	Items from SDQ	Items from SDQ Items from CBQ	CBCL	SDQ	Items from SRS and PKBS-2
Health outcomes	Height & weight General health rating (P)	Height & weight General health rating (P) Chronic condition (P)	Height & weight General health rating (P) Chronic condition (P)	Height & weight Chronic condition (P)	Height & weight Chronic condition (P)
AGE 5-7					
Language/literacy tests	DEPP Written language test [SAT]	PPVT TROG-D test of receptive grammar ELFE 1-6 Reading comprehension test NEPS Reading speed test	Language Test for Children	BAS Naming Vocabulary BAS Word Reading	ECLSK Reading test (includes PPVT items)
Maths tests	DEPP Numeracy and concepts measuring time test [SAT]	NEPS Maths test		NFER Number Skills test	ECLSK Maths test
Non-verbal skills tests		NEPS-BZT Picture Symbols test NEPS-MAT Matrix Reasoning test	SON-R Non-verbal Intelligence test	BAS Picture Similarities BAS Pattern Construction	ECLSK Executive Function test
Behavioural inventories	SDQ (P)	Items from SDQ (P & T) TASB Disruptive Behaviour (P & T) Big Five Personality inventory (P & T) NEPS Social integration, Social skills, Joy of learning, Readiness for exertion and Ability to concentrate scales (P & T)	SDQ (T) CBCL (P)	SDQ (P & T) CBSQ (P)	Items from SRS (P & T) ECLSK Approaches to Learning scale (P & T)

Domain	France	Germany	Netherlands	UK	US
Health outcomes	General health rating (P)	Height & weight General health rating (P) Chronic condition (P)	Height & weight General health rating (P) Chronic condition (P)	Height & weight General health rating (P) Chronic condition (P)	Height & weight General health rating (P) Chronic condition (P)
AGE 9-11					
Language/literacy tests	DEPP Reading skills (P, SAT), Grammar and Phonology tests National evaluation in French [SAT]	NEPS Reading competence, Reading speed and Spelling tests PPVT		BAS Verbal Similarities Key Stage 2 Reading and Writing tests [SAT]	ECLSK Reading test
Maths tests	DEPP Maths test National evaluation in Maths [SAT]	NEPS Maths test		Key Stage 2 Maths test [SAT]	ECLSK Maths test
Non-verbal skills tests	DEPP Logical reasoning test	NEPS-BZT Picture Symbols test NEPS-MAT Matrix Reasoning test		CANTAB Spatial Working Memory Task	ECLSK Executive Function test (ECLSK2011)
Behavioural inventories	DEPP Peer relations and Self-regulation scales (C)	Items from SDQ (P & C) Big Five Personality inventory (C) NEPS Social integration, Joy of learning and Readiness for exertion scales (P & C) NEPS Internalizing behaviours scales (C)	SDQ (P & C) CBCL (P) Emotion Management Scale (C)	SDQ (P & T) Items from Inventory of Callous-Unemotional Traits (C)	Items from SRS (T) ECLSK Approaches to Learning scale (P & T) ECLSK Internalizing and Externalizing behaviours; Peer and Interpersonal relations scales (C)
Child reported self concept	DEPP Global and Academic self-efficacy scales (C)	Rosenberg Self esteem scale (C) NEPS Academic, verbal and mathematical self concept scales (C)	Harter's Self Perception Profile for Children (C)	Items from the Rosenberg Self Esteem Scale (C)	
Health outcomes	Chronic condition (P)	Height & weight General health rating (P)	Height & weight General health rating (P)	Height & weight General health rating (P)	Height & weight General health rating (P)
AGE 13-16					
Language/literacy tests	DEPP Reading skills, Grammar and Phonology Brevet des colleges evaluations in French, Dictation and Writing [SAT]	NEPS Reading competence, Reading speed and Spelling tests PPVT	CITO score [SAT]	Key Stage 3 English test [SAT] GCSE English grades [SAT]	ECLSK Reading test

Domain	France	Germany	Netherlands	UK	US
Maths tests	DEPP Maths test Brevet des colleges evaluation in Maths [SAT]	NEPS Maths test	CITO score [SAT]	Key Stage 3 Maths test [SAT] GCSE Maths grades [SAT]	ECLSK Maths test
Non-verbal skills tests	DEPP Logical reasoning test	NEPS-BZT Picture Symbols test NEPS-MAT Matrix Reasoning test			
Behavioural inventories	DEPP Peer relations and Self-regulation scales (C)	Items from SDQ (P & C) Big Five Personality inventory (C) NEPS Constant stress scale (C)	SDQ (P & C)	SDQ (P) Short Moods & Feelings Questionnaire (C) GHQ-12 (C)	ECLSK Internalizing scale (C)
Child reported self concept	DEPP Global and Academic self-efficacy scales (C)	Rosenberg Self esteem scale (C) NEPS Academic, verbal and mathematical self concept scales (C)	Rosenberg Self Esteem Scale (C)	Items from the Rosenberg Self Esteem Scale (C) LSYPE Academic self concept and Locus of control items (C)	ECLSK Self concept and Locus of control scales (C) ECLSK items on difficulty, interest and enjoyment of reading and maths (C)
Health outcomes	Chronic condition (P)	Height & weight General health rating (P & C)	Height & weight	Height & weight General health rating (P) Chronic condition (P)	Height & weight General health rating (P) Chronic condition (P)

(P), (C) and (T) indicate parent, child and teacher reports respectively.

Other acronyms: BAS = British Ability Scales; CBCL = Child Behaviour Checklist; CBQ = Children's Behavior Questionnaire; CBSQ = Child Social Behaviour Questionnaire; CITO = Centraal Instituut voor Toetsontwikkeling (=Central institute for test development); DEPP = - La Direction de l'évaluation, de la prospective et de la performance; ECLSB(K) = Early Childhood Longitudinal Study Birth (Kindergarten) Cohort; ELFE 1-6 = Ein Leseverständnistest für Erst- bis Sechstklässler; GHQ = General Health Questionnaire; LSYPE = Longitudinal Study of Young People in England; NEPS = National Education Panel Study; NFER = National Foundation for Education Research; PKBS-2 = Preschool and Kindergarten Behavior Scales, 2nd Ed; PPVT =Peabody Picture Vocabulary Test; SAT = standardized achievement test; SDQ = Strengths & Difficulties Questionnaire; SON = Snijders-Oomen Non-verbal Intelligence; SRS = Social Rating Scale; TASB = Teacher Assessment of Social Behavior Questionnaire

Table 3. Selected additional explanatory variables at age 3-4 and age 5-7, available for four or five countries

AGE 3-4	AGE 5-7
Birthweight and gestation length	Parental self-rating of general health *(except GE)*
Complications during birth of child	Mother's employment hours
Duration of breastfeeding	Father's employment hours
Maternal pre-natal smoking & alcohol consumption	Number of residential moves *(except GE)*
Maternal post-partum psychological distress	Computer in home *(except GE)*
Parental self-rating of general health *(except GE)*	Time child spends watching TV *(except GE)*
Parent has a chronic medical condition *(except GE)*	Frequency parent reads/looks at books with child *(except NE)*
Subjective financial stress *(except GE)*	Frequency parent does musical activities with child *(except NE)*
Pregnancy was planned *(except GE)*	Frequency parent tells stories to child (not from a book) *(except NE)*
Mother's employment hours	Frequency parent plays sports or physically active games with child *(except NE)*
Father's employment hours	Frequency parent plays with toys or games indoors with child *(except NE)*
Parents own home	Family usually eats evening meal together *(except GE)*
Number of residential moves *(except GE)*	Child attends sports club or class
Parental religious practices *(except US)*	Child attends extra-curricular activity (not sport)
Parent is second-generation immigrant *(except US)*	Child attended preschool
Time child spends watching TV *(except GE)*	Age in months at start of formal schooling
Frequency parent reads/looks at picture books with child *(except NE)*	Parents attend parent/teacher conferences *(except NE)*
Frequency parent sings songs or nursery rhymes with child *(except NE)*	Parent is member of parent-teacher organization *(except NE)*
Frequency parents disagree over child-related issues *(except NE)*	Public/private school
Father involvement in child-rearing tasks	Class size *(except NE)*
Childcare in first, second and third years of life:	
• Relative in child's home	
• Relative in another's home	
• Non-relative in child's home (e.g. nanny)	
• Non-relative in another home (e.g.childminder)	
• Centre-based care (e.g. day nursery)	

This table is restricted to predictors at the first two developmental stages, due to space constraints and because documentation for some of the very latest survey waves is not yet available (specifically 9-11 data from ECLSK2011, 13-16 data from Gen-R).

Country-level factors. Institutional, historical and cultural factors differ across our six countries in ways that shape the environments and experiences of children within a country. Key examples of these are the organisation of child care/early education, school starting age, organisation of the education system into different tracks and types of schooling at different ages and degree of social provision of health care. System-level factors are potentially important in explaining why parental SES and other environmental influences differ in their consequences for children across countries but with a sample of just six countries their role cannot be established statistically. Instead we will draw on the expert knowledge of the national investigators to paint qualitative pictures of the countries contexts at each developmental stage, and use these frameworks to inform our interpretation of the patterns revealed by the microdata.

6. Expected output/impact and dissemination (both academic and non-academic)

This project will provide an important set of results for academic and non-academic stakeholders. The role of socio-economic conditions in childhood as they relate to the well-being of children and families are the subject of long term public, political and policy debates, as well as an important research literature. For example, the European Commission Recommendation on child poverty and well-being, "Investing in children: breaking the cycle of disadvantage", adopted in 2013, focused on levers to reduce overall inequalities in childhood across the EU. Our research will provide new evidence about the extent, timing, and sources of inequalities in child development and how those vary across six rich countries, and therefore directly contribute to these discussions and ongoing scientific debates. The work will provide a sound evidence base to inform decisions about family policies and policies relating to early childhood health inequalities by shining a light on countries/age groups where inequalities are most/least pronounced and by providing evidence about factors that are associated with reduced/increased inequalities.

The project will therefore be disseminated to both research and non-academic audiences. With regard to *academic audiences*, the work contributes to an interdisciplinary scientific debate on social inequalities and will therefore be of interest to researchers across disciplines. The methodological challenges of cross-national comparative

research will be of interest to researchers in sociology, demography, economy, education, social policy and family research. Academic dissemination will take place through peer-reviewed publications, conference presentations, and a project website. At least one relevant research paper per analysis will be submitted to peer-reviewed, high-impact journals in sociology, demography, education, economy, social policy, and family research. Team members will make presentations at a range of conferences and scientific meetings including APPAM, ESPE, PAA, SLLS, SRCD and SREE. In addition to the twice-yearly working meetings of our group, we will hold a public event in Paris in the final year to disseminate results to a wider range of experts.Academic dissemination will also be facilitated by linking to groups such as the International Child Cohort Network of the Society for Longitudinal and Lifecourse Studies.

We will take both a national and international approach to disseminating to *policy makers and non-academic stakeholders*. At a national level, we will build on project investigators' existing links to civil service, third sector, and policy makers, such as Washbrook's previous work with the Sutton Trust and the UK government's Cabinet Office (see our CVs for further details). The project website will be hosted at INED with both academic and non-academic audiences in mind, and will be used to advertise project results as well as serve as an online repository for project results after the end of the project. All project partners will link to this website to increase its awareness. At a European level, we plan to collaborate with Population Europe, a longstanding INED partner that specialises in disseminating demographic research at an EU-level. It maintains communication channels for media and journalists, and has expertise in creating content for a policy audience, including through meetings and publications. Three policy briefs will be prepared in collaboration with Population Europe, to be published within its policy brief series "Population & Policy Compact", which reaches over 2,000 policy-makers and NGO staff. The policy briefs will be launched at the final project conference, to which research, policy and non-government users will be invited. Key project results will be presented by project researchers, followed by a panel debate with stakeholders. To target policy audiences, we will organize a "policy webinar" with Population Europe with a focused message of key project results. The project will also benefit from the established dissemination channels of Population Europe, including press releases and newsletters, social media activities, announcements, and Population Digests, short 1-2 pages summaries written in close collaboration with the authors of the original publication and edited by an experienced science writer. Communication offices, social network platforms, and other dissemination tools already in place at project partners' institutions will be used: for example, PolicyBristol's monthly newsletter and INED's bilingual "Population & Societies", a monthly four-page bulletin in French and English intended for dissemination to a wide audience.

Throughout the project we will consult with an advisory group composed of one researcher and one policymaker from each country: Lee Elliott Major (Sutton Trust), Prof. John Ermish (University of Oxford), Prof. Harry Ganzeboom (Free University Amsterdam), Prof. Marc Gurgand (Paris School of Economics), Prof. Irena Kogan (University of Mannheim), Leontien Peeters (Bernard van Leer Foundation), Olivier Thevenon (OECD), and Susanne von Below (Education & Culture, European Commission). The advisory group members will attend two of our annual meetings – in year 1 in Rotterdam and in year 2 in Leipzig – to provide feedback about our research to date and plans for next steps. They will also participate in our final conference where they will play an active role as session chairs and discussants in the research and policy sessions (as appropriate).

7. Ethics

Partner institutions have established regulations and procedures to ensure their research meets the highest ethical standards, including the protection of intellectual property rights and the rights to data privacy of third parties and individuals. In this research project, there will be no experiments with humans or animals. The secondary data on individuals we will use were collected by organizations that require the highest standards. We will strictly follow our national and institutional guidelines for good scientific practice concerning factors such as scrupulousness, reliability, verifiability, impartiality, and independence (provided, for example, by the research councils, the University of Leipzig, the Association of Universities in the Netherlands and the INED and Bristol School of Education Ethics Committees and appointed Data Protection Officers).

8. Data management plan

This project makes use of existing large-scale secondary data sources. Data collection and compilation of the respective country data files has been conducted according to the prevailing ethical and privacy directives in national legislation. All micro-data are either in scientific use/public release files or permission has been granted to use them. The project will develop coding to harmonize variables across the countries and datasets. While the project can not release the underlying data sources, we will make available our coding so that other researchers can benefit from it. The project will also assemble some macro-level indicators (for country policies, etc.) from existing secondary data sources; these indicators will be documented and made accessible to other researchers.

IV. BIBLIOGRAPHY

Please list here all references quoted in your research description.

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V. BUDGETS, JUSTIFICATION OF RESOURCES AND FINANCIAL FORMS

V.1 Total requested budget per country

Please report the total amount of funds you are requesting per agency, using the table below. These amounts must be justified in the Justification of Resources.
In order to provide correct figures, please make sure to first elaborate these figures <u>with the relevant National Financial Forms. Please upload the National Financial Forms as separate documents</u>.

ANR France (including 8% administrative costs)[2] - Staff - Instruments and Equipment - Buildings and Estates - Costs of Sub-Contracting and Intellectual Property - Additional Overheads	Numbers and € -Staff: €198,000 -Instruments and Equipment: €5,000 -Travel and dissemination: €27,813 -Costs of Sub-Contracting and Intellectual Property: €20,000 -Additional Overheads: €20,145.04	Total Sum for ANR € 271,958.04
DFG Germany - Staff (Postdocs, PhD Students, Research Assistants, Support Staff, etc.) - Direct Project Cost (Travel, Visiting Researchers, Workshops, Data, Experimental Setup, Payments for Experiments, Publications, etc.) - Other	Numbers and € - Staff total Leipzig € 204,225 - Staff total Bamberg € 55,825 - Direct Project Cost total Leipzig € 23,070 - Direct Project Cost total Bamberg€ 10,750	Total Sum for DFG € 293,870
ESRC UK (80% FEC) Directly Incurred - Staff - Travel and Subsistence - Equipment - Other Costs Directly Allocated - Investigators - Estates Costs - Other Directly Allocated Indirect Costs Exceptions	Numbers and £ (80% FEC) Directly Incurred: £62,210 total -Staff: £51,686 -Travel and Subsistence: £4,000 -Other Costs: £6,524 Directly Allocated: £38,280 total -Investigators: £26,169 -Estates Costs: £12,110 Indirect Costs: £74,435 total Exceptions (Other costs): £86,721 total	Total Sum for ESRC £262,386 (80% FEC)

NWO The Netherlands
- Staff
- Material Costs:
  - Fieldwork and Datasets
  - Travel and Subsistence
  - Equipment
  - Workshops and Conferences
	Numbers and €
	- Staff: 196,995
	-Material Costs:
	- Fieldwork and Datasets: 15,000
	-Travel and Subsistence: 9,500
		Total Sum for NWO
		
		€ 229,995

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[2] For more information, please consider the dedicated document: http://www.agence-nationale-recherche.fr/fileadmin/documents/2017/ANR-RF-Fiche-COUTS.pdf

- Management Project
      Consortium/Project Meetings
    - Other (Please Specify)
-   Total Material Costs
	-Equipment: 500
	-Workshops and
	Conferences: 0 (costs
	are being paid from
	benchfee)
	-Management Project
	Consortium/Project
	Meetings: 8,000
	-Total Material Costs:
	33,000	

V.2 Justification of Resources

Please justify the requested resources by country of application, following the breakdown provided below.
max. 1 page per country.

This statement should be used to justify the resources required to undertake the research project and is mandatory. It should explain why the resources requested are appropriate for the research proposed taking into account the nature and complexity of the research proposal. All items requested must be justified. Where you do not provide an explanation for an item that requires justification, it may be cut from any grant made.

FRANCE

Please refer to the "*Réglement financier*": http://www.agence-nationale-recherche.fr/RF

The requested funds for Ined include:

Personnel costs
- Recruitment of a post-doctoral researcher for a total duration of 24 months The post-doctoral researcher will carry out analyses of the three French datasets; support the writing up, presentation, and publication of results; and will support harmonization across the international datasets. = **102 000 euros**
- Recruitment of a data manager for a total duration of 24 months. The data manager will be responsible for the data cleaning and harmonization, particularly for the ELFE survey, will create and maintain the project website, and will provide project management support. = **96 000 euros**

Travel costs
- Funding for 4 members of the Ined team to attend the bi-annual 2-day project meetings that will be held in in Bristol, UK, in mid-2020 (660 euros per participant), and in Rotterdam, the Netherlands, in mid-2021 (722 euros per participant) = **5 528 euros**
- Funding for 4 members of the Ined team and 2 outside stakeholders to attend 2-day meeting followed by a 1/2 Scientific Advisory board that will be held in Rotterdam in late 2019 (883 euros per participant) = **5 298 euros**
- Funding for 4 members of the Ined team and 2 outside stakeholders to attend 2-day meeting followed by a 1/2 Scientific Advisory board that will be held in Leipzig, Germany, in late 2020 (892 euros per participant) = **5 352 euros**
- Funding for the organisation of the project bi-annual meeting held at Ined in Paris for a total of 12 participants (110 euros per participant) = **1 320 euro**
- Costs related to the organisation of final conference at Ined, hosting 50 international participants (110 euros per participant), where project results will be disseminated to an academic and non-academic costs = **5 500 euros**
- Costs to participate to 3 key conferences to disseminate project findings: Society for Longitudinal and Lifecourse Studies (SLLS), European Association for Population Studies (EAPS), Population Association of America (PAA) = **4 815 euros.**

Consumable and equipment costs
- We have included the purchase of a laptop, to be used by the recruited post-doc = **1200 euros**
- We have planned to purchase a Stata license for the computer mentioned above = **800 euros**
- As planned in the project, we will publish two articles in open access publications and have therefore including the related costs of 2 000 euros per publication = **4 000 euros**.

Subcontracting costs:
- We have planned subcontracting dissemination activities to a company such as Population Europe in order to ensure that the impact of the project is optimal, particular among non-academic audiences. Activities include the organisation of a policy webinar and the publication of 3 policy briefs as well as general dissemination support = **20 000 euros**

Indirect costs/overheads:
- As per ANR guidelines, we include 8% overheads = **20 145,04 euros.**

Total requested to ANR for Ined: **271 958,04 euros.**

Our final budget is 31 047,84 euros more (11,4% higher) than the budget presented in the pre-proposal. This is because (1) salary scales for contractual staff have been reviewed since 2017, (2) following on valuable comments from the reviewers about our impact and dissemination strategy, we have decided to collaborate with Population Europe, a network of Europe's leading population research centres specialising in disseminating academic research, especially to non-academic audiences. We believe this will significantly improve our ability to communicate to governmental, policy and NGO stakeholders, who will have a significant interest in the results of our project.

GERMANY

Please justify all costs requested, following the breakdown in the national budget table above.

Staff

Leipzig: This subproject needs a well-trained postdoc, experienced with different kinds of advanced statistical modelling as a team member. She or he has to work with international student assessments data (PIRLS, TIMSS) for Analysis 1 and for Analyses 3-6 with starting cohorts 2 and 3 of the NEPS, which are complex in nature (student test and survey data, parental interviews, teacher reports, sometimes with partial unit-nonresponse and temporary dropouts). In the first year, there is a need for a position equivalent to 0.75 full-time, in the second and third year the team member has to work full-time: € 192,225.

A student assistant shall support the team with literature search, formatting and editing presentations, papers, outputs, organizing the workshop in Leipzig. There is need for a student assistant working 5 h/week for 3 years: € 12,000.

Staff total (Leipzig)	€ 204,225.

Bamberg: This subproject needs a well-trained postdoc (75% position) as a team member in the first year. She/he has to work with complex data sets of the infant cohort study of the NEPS (NEPS SC1) in particular (observational data, competence data, interview data, questionnaire data with partial unit-nonresponse) and to be experienced in analysing data on early childhood with different kinds of advanced statistical modelling of longitudinal data. Thus a doctoral degree or equivalent is necessary: € 52,425.

There is additional need for a student assistant (B.A. degree) to support literature research, formatting, editing presentations, papers, outputs (5 h/week for the first year)   € 3,400.

Staff total (Bamberg)	€ 55,825.

Direct Project Cost

Leipzig: Travel costs for PI and team member to the four project meetings abroad and to the dissemination conference in Paris (abroad): 10 x 1,000 € =   € 10,000.

Travel costs for scientific and policy advisor from Germany (2 persons) to two council meetings (one in Leipzig, one abroad) and to dissemination conference in Paris (abroad) as well as for one external speaker at this conference: 2 x 250 €+5 x 1,000 € =   € 5,500.

Presentation of project results on internationally renowned conferences as the RC28 Meeting of the International Sociological Association (ISA) or at conferences of the Society of Longitudinal and Lifecourse Studies (SLLS). Presenting results is also important for the promotion of the team member: 6 x 1000 € =   € 6,000.

For rural–urban comparisons the team member has to travel to the Leibniz Institute for Educational Trajectories (LIfBi) in Bamberg, as regional information are classified as sensitive and have to be analysed onsite (3 stays each 5 days): 3 x 340 € =   € 1,020.

Budget for the two-day project and stakeholder meeting (20 persons, year 2) in Leipzig (fees for seminar room, equipment etc.):   € 550.

Direct Project Cost total (Leipzig)	€ 23,070.

Bamberg: Travel costs for PI and team member to the planed five project meetings (one in Leipzig/Germany, the other four abroad) and to the dissemination conference in Paris (abroad). Travel costs for two project meetings (abroad, 2 persons), two meetings plus dissemination conference (abroad, 1 person) and one project meeting in Germany: 7 x 1,000 € + 250 € = € 7,250.

Results of the (sub-)project have to be presented at internationally renowned conferences as the Biennial Meeting of the Society for Research in Child Development (SRCD), Annual Meeting of the American Educational Research Association (AERA) or at conferences of the Society of Longitudinal and Lifecourse Studies (SLLS) as well as on the dissemination conference. In addition, presenting results is important for the promotion of the team member. Costs for three years: € 3,500.

Direct Project Cost total (Bamberg)	€ 10,750.

Total Sum for DFG (Leipzig + Bamberg):   € 293,870.

Our final budget is 14,322.40 EUR higher (5.1%) than the one presented in the pre-proposal, as we use recent salary scales, budget costs for the two German advisory board members, for an international speaker at the dissemination conference and for the two-day project and stakeholder meeting in Leipzig.

NETHERLANDS

Please justify all costs requested, following the breakdown in the national budget table above.

Table 3 delineates the budget request of the Dutch team. The costs are specified by two categories: personnel costs and material costs. The total costs of the Dutch team amount to **229,995 €.**

The **personnel** costs are mainly devoted to financing one post-doctoral researcher (0.7fte). We require a post-doc researcher to accomplish the tasks as a firm methodological background is required to conduct the longitudinal analysis that we aim for in this project, which we cannot expect from a junior pre-doc researcher. The post-doc will be classified according to the Dutch University Salary agreements and will receive annual gratification payments. In addition, the post-doc also receives a bench fee, from which travel costs and other costs can be paid for. We also seek money for a replacement subsidy to allow the PI to delegate some of her teaching duties and research tasks to a post-doctoral researcher (0.2 fte), enabling the PI to devote considerable time to the supervision of the post-doc researcher and to coordinate the two assigned analyses.

The **material costs** consist of travel costs, equipment costs, project meeting costs and costs for data access.

Travel and subsistence. As the travel costs for the post-doc researcher will be covered by the bench fee, the travel costs listed here are the travel costs the PI and the two Dutch members of the Advisory board make. The PI is not funded by the ORA-grant, but her travel costs related to this project are asked for. The PI's travel costs will be devoted to attending international and national conferences where the project members will present the results of the project. It is planned to present the findings from this project on the following international conferences: the Annual Meeting of the Population Association of America, the Annual meeting of the American Sociological Association and the Annual conference of the Society for Longitudinal and Lifecourse Studies. The Dutch team will present their results also at national meetings, such as the annual meeting of the Dutch Demographic Day and the Annual meeting of the Dutch Sociological Association. The PI and the post-doctoral researcher are expected to travel to these venues. Funding is also requested for the travel costs the PI makes to attend two one-day project meetings (Paris Y1 and Bristol Y2). Funding is also requested for the travel costs the PI and the Dutch members of the Advisory Board make to attend two two-day project & stakeholder meetings (Leipzig Y2 and Paris Y3)

Equipment. As the post-doc researcher will make use of Stata for analyzing the data, one Stata license need to be paid for. The costs for this perpetual license is placed under equipment costs.

Management project consortium/project meetings. The Dutch PI will also organize a one-day project meeting (12 persons, Y3) and a two-day project & stakeholder meeting (for 20 persons, Y1) in Rotterdam. Budget for arranging, hosting and catering these meetings is also asked for.

Other. Money is requested to cover a data access fee for using the Generation R dataset as the Dutch data source.

Table 3: Budget calculations the Netherlands (in €)

	Year 1	Year 2	Year 3	Total
Personnel costs				
0.7 fte Post-doc Researchers	47.527	49.763	52.040	149,330
0.2 fte Replacement subsidy	13,579	14,218	14,868	42, 665
Benchfee postdoc	5000			5,000
Subtotal personnel costs	**66,106**	**63,981**	**66,908**	**196,995**
Material costs				
Travel costs	2,000	3,500	4,000	9,500
Equipment:				
Stata license	500			500
Management:				
Organising project (& stakeholders) meetings	6,000		2000	8,000
Other:				
Data access fee	15,000			15,000
Subtotal material costs	**23,500**	**3,500**	**6,000**	**33,000**
Total	89,606	67,481	72,908	**229,995**

UNITED KINGDOM

Please justify all costs requested, following the breakdown in the national budget table above.

Directly allocated costs: Investigators
Principal Investigator (PI). Washbrook (15%) will play an important coordinating role in the project as well supervising the research associate and providing them with day-to-day support on data management and analysis. She will draw on her previous experience as PI on a similar cross-national project, and on her methodological work in this area, to provide guidance on data harmonization and statistical issues that cut across all six analyses, as well as leading directly on analyses 1 and 4. With her expertise in the US, as well as UK, datasets she will co-supervise the US-based graduate research assistant with Waldfogel, participating in regular telephone/Skype meetings (replicating a role she has played in previous projects). She will contribute to all project publications, presentations and research briefings and lead on UK-based dissemination activities via her links with organisations such as PolicyBristol and the Sutton Trust.

Directly incurred costs: Staff
Research Associate (50%). A research associate (a quantitative social scientist or social statistician) will be employed half-time for the duration of the project to work with the two UK datasets (working under UKDS Secure Access conditions where necessary) and ILSA data. They will assist Washbrook in data preparation and analysis, preparation of journal articles, and dissemination activities. The role requires familiarity with statistical software, the ability to undertake analysis of multiple complex longitudinal datasets, and syntheses of literatures on childhood inequalities from a broad range of social sciences. Given the well-known UK skills shortage in quantitative social science and the inter-disciplinary nature of the project, it is anticipated that the researcher will need substantial input and guidance from Washbrook on a regular basis.

Directly incurred costs: Travel & subsistence
Project meetings. Funding is requested for the UK PI to attend two one-day project meetings (Paris Y1 and Rotterdam Y3) and two combined two-day project and advisory group meetings (Rotterdam Y1 and Leipzig Y2).
Advisory board meetings. Funding to support the attendance of two UK-based advisory group members (travel, accommodation and subsistence) at two one-day advisory group meetings (Rotterdam Y1 and Leipzig Y2).
Two-day final project conference. Funding is requested for the UK PI for travel, accommodation and subsistence at the final two-day project conference (Paris Y3).

Indirect Costs
Conference presentations. Travel, accommodation, subsistence and registration costs are requested for the UK PI Washbrook (or the Bristol-based RA in her place) to present the project research at the following conferences:

> European Society of Population Economics (ESPE), June 2020, location unknown
> Royal Statistical Society (RSS) Annual Conference, September 2020, location unknown
> Society for Research on Child Development (SRCD) Biennial Meeting, April 2021, Minneapolis, USA
> European Conference on Educational Research (ECER), September 2021, location unknown

Project meetings. The UK PI will also organize a one-day project meeting (12 persons, Y2) in Bristol. Budget for arranging, hosting and catering this meeting is also asked for.
Two-day final project conference. Funding for travel, accommodation and subsistence at the final two-day project conference (Paris Y3) for three persons (in addition to the UK PI): two UK-based advisory group members and one external invited speaker.

Other Costs (International Co-Investigators)
28% of the total budget is allocated to Columbia University to support the US analyses. No funding is requested for the Co-I's (Waldfogel's) time, but we require £77,231 to support a graduate research assistant (50%FTE) to conduct analyses on the three US datasets (some of which are restricted to users based within the US). We also request funds for travel, accommodation and subsistence for the Waldfogel to attend the five European project meetings and final project conference in Paris mentioned above (£8220), plus funding for one US team member to attend the US-based APPAM conference (£1270).

ANNEXES (TO BE UPLOADED SEPARATELY)

- **CURRICULUM VITAE**

  Please provide CVs of Main Applicant, PIs, and Co-Is, grouped by country. There should be no more than two pages per CV.

- **NATIONAL FINANCIAL FORMS**

  Please note that in addition to the justifications done in V.2, applicants from France, the Netherlands and the UK are asked to fill out National Financial Forms per country for the funds requested and to upload them as separate documents. Use the National Financial Forms available on http://www.dfg.de/ora. German applicants will upload their proposals via the DFG Elan portal and specify their budget there.

- **SUMMARY OF JAPANESE PROPOSAL (only if applicable)**