

The Effects of Early Childhood Education on Children's Cognitive and Social Skills: A Cross-Country Study

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The process of skills formation is complex since skills are acquired and developed in a variety of formal and informal learning settings throughout the entire life.

Moreover, skills develop cumulatively: what individuals learnt in the past works as steppingstones for present and later acquirements (DiPrete and Eirich 2006).

Consequently, learning in the earliest years is of great relevance not only because in this life period children acquire knowledge at a fast pace in various domains (e.g., in motor, linguistic, numeric, socio-emotional area), but also because present children's well-being and their future development are strictly linked to the solidity of these basic acquirements (OECD 2018; Heckman 1999).

It is in these veins that countries have increasingly invested in “early years policies” not only as a tool to increase mothers' participation in the labour market but also for providing all children with a strong start in inclusive and high-quality formal learning environments, regardless to their characteristics and backgrounds (Gambaro, Stewart, and Waldfogel 2014; Blossfeld et al. 2017) With the expansion of their early childhood education system (ECE, hereafter) from the early 2000s onwards, many European countries witnessed, therefore, a growth in ECE participation rates (OECD 2001). Given this context, we ask: to what extent does ECE attendance affect children's development of cognitive and social skills? How do these patterns vary across countries? Are the learning benefits of ECE participation greater for children from less advantaged social backgrounds compared to those from high SES families?

We contribute to advance the literature in several respects. First, we improve the measurement of ECE experience since we clearly distinguish between early childhood education for 0-2 years old children (ECEC) and preschool institutions for 3-6 years old children (PS). Second, we focus on ECE effects on both cognitive and social skills in the medium-long run, that is when children are already 15 years old. This allows us to contribute to the debate on whether the short-term effects detected in many studies last until early adolescence, and whether ECE attendance is not only related to cognitive skills but also social competencies. Third, we develop a counterfactual framework that can credibly take into account processes of selection into ECE within a cross-country design. Fourth, inspecting these issues in a comparative perspective also enables us to provide qualitative insights about whether the ECE effects are homogeneous or vary across contexts characterized by heterogeneous institutional features.

Our empirical analysis draws on data from the 2015 Programme of International Student Assessment (PISA hereafter), which collects information on 15-years old students' competencies across OECD countries and partner economies. Our final analytical sample includes a total of 41,676 students over six European countries: 9,367 in Belgium (BG); 5,592 in Germany (DE); 6,611 in Spain (ES); 5,911 in France (FR); 2,952 in the United Kingdom (UK); and 11,243 in Italy (IT). We focus on three outcomes: standardized test scores in reading, mathematics and collaborative problem solving. The two main treatment variables are two dummy variables indicating whether the child attended respectively 1) early childhood education and care centres (ECEC hereafter) or not; 2) preschool (PS hereafter) or not. Students' socio-economic status is treated as a control variable in the first set of analyses and a moderator variable in the second set of analyses focused on heterogeneous effects of ECE. Relying on estimators that assumes selection on observed variables might be problematic, since the number of covariates available retrospectively is limited and the estimation would anyway suffer from omitted variables problem. To overcome these issues, we relied on an endogenous treatment model (Maddala 1984), which estimates two simultaneous equations, one modelling selection into the treatment and the other modelling our outcome variables. Letting the two error terms to be correlated, under the assumption of joint normality, is a way to tackle potential issues of unobserved heterogeneity. To avoid identification exclusively on functional assumptions, we rely on an exclusionary restriction variable, which captures whether ECE attendance was mandatory or not in the country under analysis. We find that ECEC attendance has a null or a negative impact on reading skills at 15 years old while, on the contrary, preschool participation, has a positive impact in most of the countries. Yet, when significant, ECE seems to be, in most countries, a complementary tool rather than playing a substitution role, thus favoring children who are already privileged in terms of social backgrounds.