infoIEB Number 42 · December 2022

IEB Institut d'Economia de Barcelona

Universitat de Barcelona

Parental Responses to Children's Differences in Innate Conditions: Are Parents Inequality-Averse?

Lifetime inequality is due to multiple factors, including the environment where individuals grow and innate differences, such as differences in health at birth or simply in genes. A large strand of literature in economics and psychology demonstrates the importance of characteristics shaped in childhood in determining later-life success. Crucially, this literature shows that at least 50% of the variability of lifetime earnings across people can be attributed to characteristics determined by age 18 (see, e.g., Heckman and Mosso, 2014). This suggests that our income is largely determined by characteristics beyond our choice. Does this imply that some part of inequality simply reflects differences in innate endowments and is unalterable? It does not. Inequality based on differences in innate characteristics can, like other inequalities, be ameliorated via redistributive policies, such as compensatory education, or via parental investments. First, strong quasi-experimental studies estimate that the returns of an additional year of education are in the range of 10-12% (see Deming 2022 for an extensive review). Second, studies show that policy interventions affecting low-income children (e.g., Medicaid or food stamps) have long-term benefits and the positive effects are especially profound in the early stages of childhood (see Aizer, Hoynes, and Lleras-Muney 2022 for a review). Third, recent studies highlight the importance of parental economic characteristics and parental time investments for children's cognitive development (Falk et al. 2021). Hence, interventions and investments targeted towards disadvantaged children may decrease the gap associated with initial endowments.

In this article, I focus on the role played by parents in shaping inequality associated with children's early-life conditions. I discuss my two recent works where I investigate how parents respond to differences in children's health at birth and genetic endowments. Specifically, in both studies I pose the following question: Do parents react to children's initial differences in health or genetic endowment levels? Do they intend to eliminate initial differences between their children through compensatory investments in the children's human capital or do parental investments reinforce initial differences between children? Understanding whether parents act as equalizing agents is important for the design of compensatory policies. Depending on parental behaviour, policymakers may decide whether such policies should be targeted towards families rather than towards individual children. Suppose that parents are inequality-averse and intend to eliminate differences between their children through compensatory investments. In that case, a policy that increases the human capital of less well-endowed children would be less effective, since it would induce parents to equalize less. However, if parents care more about efficiency than equality and follow a reinforcing strategy in their investment decisions, such policies would be more effective, since they would induce parents to reinforce less. In the former example, policies that target individual children rather than families may be less effective at reducing inequalities; in the latter example, it may be more effective to target individual children than families.

Inequality based on differences in innate characteristics can, like other inequalities, be ameliorated via redistributive policies, such as compensatory education, or via parental investments.

In the first paper, "**Parental Human Capital Investment Responses to Children's Disability**" (forthcoming in the *Journal of Human Capital*), I study how the well-documented schooling gap between disabled and non-disabled individuals is affected by intra-household allocation of resources in Mexico. One of the important channels through which a disability may lead to diminishing well-being and the likelihood of poverty is the lack of education experienced by people with disabilities. Figure 1 shows that a large share of 16- to 30-year-old disabled individuals in Mexico have no primary education and that disabled individuals in Mexico have, on average, 5.4 fewer years of schooling than non-disabled individuals. This may suggest that children with disabilities in Mexico face many barriers to accessing education. But can this difference be partially attributed to parental reinforcing investments?

To answer this question, I develop a theoretical model where parental responses to children's disability status depend on two factors:

1) Their degree of inequality aversion (that is, parental preferences for equality versus efficiency. If parents are inequality-averse, they will try to compensate children with disabilities by providing them with additional investments; if they care more about efficiency, they may invest less in the human capital of children with disabilities than in children with no disabilities because of the lower returns.

2) The "price effect" or the cost of increasing children's human capital, which may in turn depend on children's disability status. The price effect may be important if, for example, it is more difficult to choose an appropriate school for an unhealthy child than for a healthy child.

This is, to my knowledge, the first study highlighting the relevance of these two mechanisms in shaping human capital accumulation. I show that, even if parents are inequality-averse, they may still choose to provide more education to non-disabled children than to disabled children if the cost of investing in the education of disabled children is sufficiently larger than the cost of investing in the education of their non-disabled siblings. This may

explain why many previous studies have found that parents invest more in higher-endowed children than in less well-endowed children. For example, Rosales-Rueda (2014) found that parents in the U.S. invest less in children with mental conditions relative to their healthy siblings.

To infer the presence of parental inequality aversion empirically, I exploit the fact that parents of only children *cannot* possibly exhibit inequality aversion, while the disability schooling gap of children from multi-child families may, in contrast, be affected by both parental preferences and the different costs of education for disabled and non-disabled children. Therefore, my empirical strategy relies on the comparison of children's education between one-child and multi-child families with non-disabled children and where one child has a congenital disability. Note that one-child and multi-child families with disabled and non-disabled children may differ in many aspects. To make these families comparable, I use a statistical technique called entropy balancing that allows me to compare them under certain assumptions.

The results suggest that the disability schooling gap is lower in multi-child families than in one-child families (Figure 2), which is consistent with parental inequality aversion. All the evidence suggests that parents redistribute part of their resources from non-disabled siblings to a sibling with a disability. This compensation effect reduced the disability schooling gap by about 13% but it did not eliminate the gap completely.

In a related paper, "**Sibling Differences in Genetic Propensity for Education: How do Parents React?**" (with Anna Sanz-de-Galdeano, conditionally accepted in the *Review of Economics and Statistics*), we take advantage of recent advances in behavioural genetics to revisit a question: How do parents respond to children's genetic endowments and to differences in genetic endowments among siblings? Theoretical predictions suggest that if parents are inequality-averse, the genetic endowment of a child relative to that of his/her siblings and parental investments in him/her should be inversely related. However, the opposite should be true if parents care more about efficiency than equality. Therefore, we test these predictions empirically.

Importantly, we use a novel measure of a child's initial endowments: a summary index based on DNA. The human genome consists of a large

The findings of the two papers reach similar conclusions: parents are averse to inequality in the distribution of their children's human capital

set of DNA molecules. In approximately 99% of locations in the genome, there is no variation across individuals. The remaining 1% of genome locations can be used to study the impact of genes on different outcomes, such as educational attainment or cognitive ability. The summary index that we use—educational polygenic index—incorporates information about approximately 1.2 million genome locations and assigns higher weights for genes that are strongly associated with educational attainment. As a result, we have a continuous measure of educational genetic endowments, and a higher value of this measure means that an individual is genetically more prone to obtain high levels of education. Note that previous studies about parental investments are mainly based on children's birthweight or other health-related indicators, which are problematic since these indicators may reflect differences in pre-natal and early-childhood parental investments. The advantage of using genetic data is that DNA is fixed at conception and its variation is random across siblings (conditional on parental genes). Importantly, educational polygenic index explains about 15% of the variation in education across individuals in our sample of adolescents in the U.S. Previous studies also show that this index is strongly associated with labour market outcomes and even with wealth at retirement (Papageorge and Thom 2020, Barth, Papageorge and Thom 2020). To measure parental investments, we construct a summary index based on questions related to parental time investments in children's human capital (e.g., "*Worked on a project for school with the mother/father in the past four weeks*").

Consistently with the first paper, our results indicate that parents in the U.S. invest more in a child if his/her siblings have higher genetic propensity for education—that is, they are averse to inequality. Importantly, our results

Figure 1. Years of Education by Disability Status

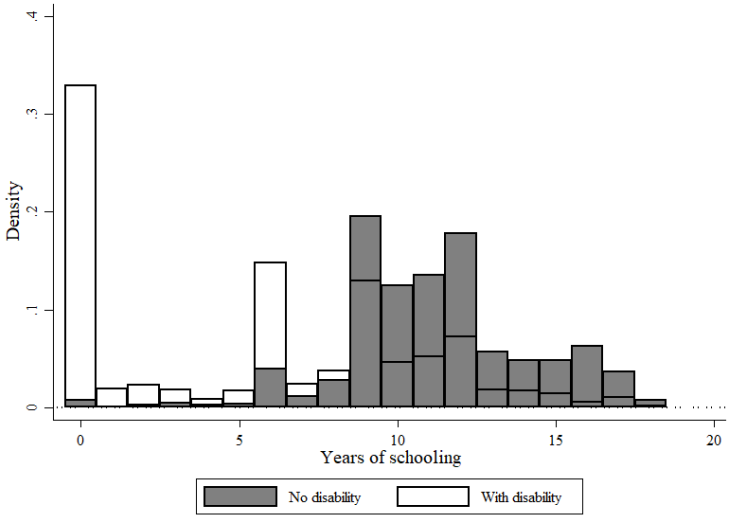
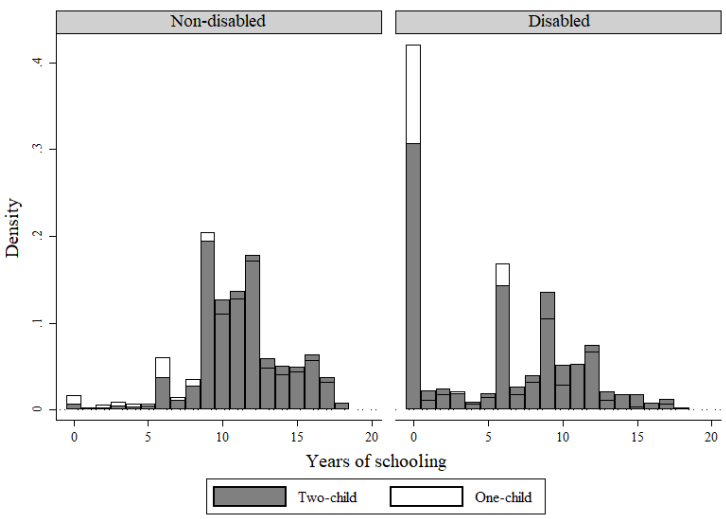


Figure 2. Years of Education by Disability Status and Family Size



Particularly, the findings suggest that such interventions could target families rather than individual children since families tend to redistribute their resources towards disadvantaged children.

are robust to inclusion of parental genetic characteristics and other family and individual characteristics. Hence, parental investments in children may actually reduce the effect of inequalities in genetic endowments. Another important theoretical prediction is that parents may not be able to completely separate the inputs devoted to each child when siblings are close in age (Bharadwaj et al., 2018). We show theoretically that when parents cannot separate their inputs, the effect of parental inequality aversion will be attenuated towards zero. To test this empirically, we estimate our model only for twins and find that, in line with our theoretical predictions, parents do not respond significantly to twins' differences in genetic endowments.

The findings of the two papers reach similar conclusions: parents are averse to inequality in the distribution of their children's human capital. This may inform policies aimed at reducing the negative effects of childhood health conditions on human capital formation. Particularly, the findings suggest that such interventions could target families rather than individual children since families tend to redistribute their resources towards disadvantaged children. Importantly, policymakers may consider that the impact of compensatory education programmes can be reduced in the presence of inequality aversion. If these policies are targeted at individual children, parents may act less as equalizing agents and redistribute resources away from the child being compensated and toward themselves or other children, thus distorting the original intent of the policies. However, providing additional resources to families and relying on them to distribute resources might be effective for reducing inequality.

Of course, like any study, the described works have some limitations. For instance, parental preferences for equality may differ across countries depending on pension systems, culture, informal and formal institutions, and other factors. I believe that considering differences in parental preferences across countries or depending on the institutional setting is an important direction for future research since it may shed some light on determinants of cross-country differences in inequality associated with early-life conditions.

References

Aizer, A., Hoynes, H., & Lleras-Muney, A. (2022). Children and the US social safety net: Balancing disincentives for adults and benefits for children. Journal of Economic Perspectives, 36(2), 149-74.

Barth, D., Papageorge, N. W., & Thom, K. (2020). Genetic endowments and wealth inequality. Journal of Political Economy, 128(4), 1474-1522.

Bharadwaj, P., Eberhard, J. P., & Neilson, C. A. (2018). Health at birth, parental investments, and academic outcomes. Journal of Labor Economics, 36(2), 349-394.

Deming, D. J. (2022). Four facts about human capital. Journal of Economic Perspectives, 36(3), 75-102.

Falk, A., Kosse, F., Pinger, P., Schildberg-Hörisch, H., & Deckers, T. (2021). Socioeconomic status and inequalities in children's IQ and economic preferences. Journal of Political Economy, 129(9), 2504-2545.

Heckman, J. J., & Mosso, S. (2014). The Economics of Human Development and Social Mobility. Annu. Rev. Econ., 6(1), 689-733.

Papageorge, N. W., & Thom, K. (2020). Genes, education, and labor market outcomes: evidence from the health and retirement study. Journal of the European Economic Association, 18(3), 1351-1399.

Rosales-Rueda, M. F. (2014). Family investment responses to childhood health conditions: Intrafamily allocation of resources. Journal of Health Economics, 37, 41-57.

Sanz-de-Galdeano A., Terskaya A. (2022). Sibling Differences in Genetic Propensity for Education: How do Parents React?

Terskaya, A. (2022). Parental Human Capital Investment Responses to Children's Disability. Forthcoming, Journal of Human Capital.

Anastasia Terskaya
(Universitat de Barcelona & IEB)