The effect of growing up poor on early child development in Flanders – an analysis of birth cohorts 2006 – 2009.

Lieselot De Keyser[1], Ronan Van Rossem[2]

[1]Department of Sociology, Ghent University, Ghent, Belgium
[2]Department of Sociology, Ghent University, Ghent, Belgium

1. OBJECTIVE

In 2014, 12.8% of the children in Flanders grew up in a household with an increased risk on poverty (Kind en Gezin, 2014). These children already lag behind from birth onwards in both intellectual, social and physical development. (Haelterman e.a., 2007; UNICEF, 2014). Early childhood is considered the most important developmental phase throughout one's lifespan (Gluckman e.a., 2008; Li e.a., 2004; Prendergast & Humphrey, 2014). Many studies have demonstrated that the socio-economic deprivation of a household negatively affects the neo- and perinatal health of children born into these households (Bobak, 2000; Kramer e.a., 2000).

The paper examines to what extent the socio-economic household background – measured by a poverty index and maternal education - influences birth characteristics and the physical development of young children during the first three years of life. We want to get insight in the Flanders' situation because less is known about the physical development of young children in this specific context. A better understanding in the mechanisms that are underlying the socio-economic differences in growth in early childhood, can be used to set up and/or evaluate intervention programs and so prevent (widening) health inequalities.

2. METHODS

Dataset. We use the administrative IKAROS of dataset 'Child and Family' [Kind en Gezin] (K&G) to explain our research questions. K&G is a Flemish public institution that is entrusted with policies related to family support. This dataset is appropriate because it registers data on the development of nearly all children in Flanders in a longitudinal way, what makes it a unique instrument. We use data of children born between 2006 – 2009. We analyzed information of N = 291.230 births, which covers N = 2.949.169 check-ups.

Biometric indicators. Gender- and age-specific z-scores of height and weight were used as outcome variables. We used the L-M-S method (Cole, 1990) to standardize the anthropometric measures, conform the recommendations of the World Health Organization (WHO) (de Onis e.a., 2009). To estimate the standard deviations scores (SDS) of the anthropometric variables the formula : $SDS = [(Measurement/M)^{L} -1) / (L \times S)]$ was used. In this formula M represents the median, L the power to remove skewness, and S the coefficient of variation (Brannsether e.a., 2014).

Poverty index. K&G defines poverty as "*a lasting situation in which people are restricted in their opportunities to participate sufficiently in socially highly valued goods such as education, employment, housing, etc. This is not a single event but a lasting condition that occurs in various fields, both tangible and intangible*" (Kind en Gezin, 2014, p. 123). As a consequence, they measure poverty-risk as a multidimensional index, based on 6 household deprivation indicators : (1) irregular or low monthly household income, (2) precarious employment situation for both parents, (3) their low educational level, (4) low levels of educational and physical stimulation of the children, (5) unhealthy or unsafe housing and (6) poor health status of these children. A family is considered at risk for poverty when it scores on at least three criteria (Kind en Gezin, 2008).

Maternal education. Maternal education is used as alternative measure of socio-economic status. Parental education also determines the intergenerational transmission of poverty; the lower the educational level, the higher the risk on poverty (Volders e.a., 2015). We only use maternal information because Information of the paternal education is not registered by K&G. We operationalized maternal education based on five categories : (1) special needs education, (2) primary education or no education, (3) lower secondary education, (4) higher secondary education and (5) tertiary education.

Control variables. We controlled our analyses for gestational age (in weeks) , age of the mother (number of years) and region of origin of the mother. This latter indicator is measured by mother's nationality at the time of childbirth. We distinguish 7 categories : (1) Belgian mothers, (2) with a Northern (3) Western (4)Southern or (5) Eastern European nationality. We also split up non-European members as (6) Turkish and Moroccan – because they are the largest non-European migrant groups in Belgium (Milica Petrovic, 2012) - and (7) mothers from another non-European nationality.

Methods. First, we used regression analysis to investigate the role of socio-economic indicators on gestational age, birth weight and birth height. Secondly, we apply growth curve modeling to examine differences in the developmental process of young children. Growth curve modeling is a specific multilevel method that can correctly model height change with age. So, individuals were treated as level-two units and each height measurement as level-one units. Using this method, we were able to incorporate all available data and not only the respondents with complete data. By analyzing both birth characteristics and the developmental evolution during early childhood, we get insight in whether and how differences evolve during the first three years of life

3. RESULTS

Birth characteristics. Children who are born in a poor household situation show in general a lower birth weight (-110 gr) and birth height (-0.63cm) than children who are not born in poor household situation. This pattern is the same when we differentiate to maternal education. In general, the lower the maternal education, the lower the gestational age, birth weight and birth length. The difference in body size at birth between children of the lowest educated mothers and those of the highest educated mothers amounts 290gr and 1.28cm.

Physical development in early childhood. First, maternal education better predicts differences in both weight- and height development than the poverty index does. Likewise the analysis of birth characteristics, there exists a social gradient who follows the lines of maternal education. Generally, the lower the maternal education, the bigger the difference in size. Although the differences are relatively small in present-day society, they are consistent during the observation period.

When we examine the weight development of young children in relation to maternal education levels, our results show that during the first six months, the weight development of children of the lowest educated mothers is a little retarded. From then on, this group start to overcompensate their previously accumulated developmental deficit; which results in relatively high weight-for-age z-scores between 12 and 36 months for this group. Our results are in line with previous studies who found that children are able to catch up earlier physical delays, if a supporting context is present (Prendergast & Humphrey, 2014).

4. DISCUSSION

Our results support previous claims that the effects of social conditions on the physical development of young children have weakened over time in high income countries (Li e.a., 2004; Mackenbach, 1991). Notwithstanding, despite all initiatives in Flanders to reduce socio-economic inequalities, a social gradient is still observable in the physical development of young children. Furthermore, maternal education seems to better predict differences in weight and height than the poverty index of K&G does.
Because the adult health problems are largely influenced by the health status during the first years of life, monitoring of all children from the conception on must remain a policy priority. Early interventions can have a crucial impact on the further life course of children (WHO, 1999).

Our study has some specific limitations, however. First, we were not able to control for parental height measures because K&G does not registers this information. Although, some studies have shown that this is an important indicator for childhood height (Galobardes e.a., 2012; Li e.a., 2004), while other studies refute this more genetic focus (Prendergast & Humphrey, 2014). Second, we were appointed to work with the general poverty index and not with the six specific indicators because of data -related issues. In the registration system, the answer category was standard on 'no risk of poverty'. As a consequence, it is difficult to specify the domains that are responsible for the increased risk of poverty according to K&G. K&G also admit that the poverty risk index slightly underestimates the numbers until 2010. From then on, a revision of the registration system was introduced (Kind en Gezin, 2014, p. 116).

Further research is needed to compare our data internationally and investigate the macro-structural policy impact of welfare regimes. A specified welfare regime typology that focuses on the influence of social policy of child development could reveal which policies are effective in reducing developmental differences and also which environmental contexts are productive in enhancing the overall life conditions – reflected in little biometric differences.

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