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Poverty in Mayan children in Quintana Roo, Mexico

Beatríz Gómez
Universidad de Quintana Roo, ximenagomez23@gmail.com

Miguel Barrera
Universidad Autónoma del Estado de Quintana Roo, miguel.barrera@uqroo.edu.mx

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Beatriz Gómez**

Miguel Barrera***

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Abstract

Child poverty is a topic that is rarely addressed in the literature on poverty. The reason for this is that its methodology requires field work for anthropometric measurements and observation of the immediate environment. In this sense, the degree of poverty among children of the Yucatecan Mayan ethnic group of Quintana Roo, Mexico, was estimated using an instrument composed of six indicators which was applied in 120 households (271 children) in four Mayan localities in José María Morelos, Quintana Roo. Although signs of poverty were found, the results indicate that it is not as intense as expected.

Pobreza en los niños Maya en Quintana Roo, México

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Resumen

La pobreza infantil es un tema que rara vez se aborda en la literatura sobre pobreza. La razón de esto es que su metodología requiere trabajo de campo para las mediciones antropométricas y la observación del entorno inmediato. En este sentido, el grado de pobreza entre los niños del grupo étnico yucatecano étnico de Quintana Roo, México, se estimó utilizando un instrumento compuesto por seis indicadores que se aplicó en 120 hogares (271 niños) en cuatro localidades mayas en José María Morela, Quintana Roo. Aunque se encontraron signos de pobreza, los resultados indican que no es tan intenso como se esperaba.

Introduction

Children are the most vulnerable age group to the devastating effects of poverty. In fact, no matter which methodological lens is used to observe poverty in this population, the result is the same. When analyzed from the perspective of social mobility and dynamic poverty, poor children are certain to become poor adults who will have poor children. Under the lens of relative poverty, children will have the least capacity to generate income and accumulate wealth compared to other individuals, even within their own household. If the phenomenon is approached from a human development perspective, the result will be that those children, due to early malnutrition problems associated with low income, will be those who will have cognitive and full physical development problems as adolescents and adults. If analyzed from a static poverty perspective, it will be found that children are the ones who suffer the most from the consequences of economic policies such as cuts in education, culture and sports, or have precarious access to public health services, not to mention public security in the context of countries at war or guerrilla warfare, or with problems of drug violence and forced displacement, such as Mexico.

If, according to the previous paragraph, the situation of poverty among children does not present an encouraging picture, we should add the fact that in Latin

American and Caribbean countries, being indigenous or living in rural contexts, as proposed in this article, are very strong determinants of poverty (Arbona, 2008; Barrera & Reyes, 2020; Tamez et al., 2019). From the above, it follows that the objective of this work is to estimate the level of poverty among children of the Yucatecan Mayan ethnic group in the state of Quintana Roo, Mexico. The importance of addressing child poverty is relevant because, as stated by Minujin et al. (2006, pp. 18-19),

> children are not poor by themselves because they are not economically and legally recognized as independent actors. It is therefore necessary to understand child poverty in a social context. It is important to consider, among other things, the composition of the family, differences in the distribution of resources within the family, the number and gender of children in the household, and the gender of the head of the household [...]. The social and physical environment, the situation of the community and society in general have a decisive impact on the development of children's capabilities.

In order to achieve the stated objective, the Unicef indicators of child poverty (2004, 2014) were replicated with work field in four municipalities of José María Morelos, Quintana Roo, during the second semester of 2019 and the first trimester of 2020, before the Covid-19 pandemic —the poverty estimation was carried out using the methodology proposed by Bourguignon y Chakravarty (2003). In the theoretical and conceptual section, a conceptual and theoretical discussion on child poverty is presented. Next, the methodology and construction of the variables used to estimate poverty among Mayan children in Quintana Roo are explained. Finally, the results and conclusions are exposed.

In economic theory, the concern about not only the definition, but especially the conception of the quality of life of the population can be attributed to Thomas (Malthus, 1998), who places the genesis of this analysis beyond the conceptual and philosophical in economics (Platt, 2005). Malthus was concerned with the way in which the capitalism of his time created conditions of misery, poverty, and scarcity of resources in a growing population such as that of England. His perspective beyond theory implied a deeper handling of data, which was reflected in Malthus' Law, where the problem to be solved was to balance the geometric growth of population with the arithmetic growth of food production. According

to Malthus himself (1998), failure to find this balance would have economic consequences, especially for the poorest populations.

Although Malthus' analysis is valuable for economic theory, it was not until John Stuart Mill (2001) that the child population was included in economic thought and the conception of living conditions (Platt, 2005; Harris, 1990). Mill (2001) points out that it is a moral crime to have children without sufficient economic and moral conditions to feed and educate them, and that if this is not regulated, the State should take care of them. Platt (2005) points out that it is not surprising that post-Mill interest in the economic conditions of children seemed to fall into a kind of academic lethargy, since even among thinkers and researchers there was no uniform consensus on poverty in general.

In the sense of the previous statement, it is appropriate to take up authors such as Paz et al. (2016), who point out that in previous centuries the socio-historical construction of youth and childhood was somewhat different from that of today, since factors such as the implementation and development of industrial capitalism shaped certain unfavorable norms and patterns for youth and children.

In the critique of the capitalist model by Marx (1971; 1985), Marx y Engels (2019), and Engels (1999), although they do not explicitly study the issue of child poverty, it is clear to these authors that before and after the Industrial Revolution, children suffered from situations of precarious work and slavery. For example, the Communist Manifesto points out that industries with modern machinery replaced small workshops and relegated workers to being either slaves of the machines or foremen whose abilities and skills were less necessary, implying that "the greater the development of modern industry, the greater the proportion in which the labor of men is replaced by that of women and children" (Marx & Engels, 2019, p. 40). This situation precarized the social conditions of children. In fact, Paz et al. (2016, p. 1306) synthesize these ideas about childhood and poverty in Marx's texts by stating that:

> In the pre-industrial era, child labor responded to the needs of a developing capitalism, there were no labor laws, and children entered the labor market without any restrictions. Later, some laws were enacted prohibiting the employment of children or limiting their working hours, which had little effect on improving their labor situation.

In a modern context, Rowntree (1902) points to the existence of a cycle of poverty associated with the presence of children, adolescents, adults, and the elderly in a household, i.e., the arrival of children in the household generated greater expenses that could only be covered by the income of the adult male. This situation became more bearable once the children were able to work and contribute their income to the household's accumulated income. However, this phase was fraught with risk, as there was also the possibility of the children's emancipation from the household once they reached young adulthood, leaving the burden of income, along with the arrival of new children, on the head of the family.

In the case of old age and children orphaned, the latter mainly due to wars, conditions of palpable vulnerability were created, since the household income would depend entirely on savings and accumulated assets in the case of older adults, and on the income generated by older siblings or by children reaching the average age of twelve or fourteen to be able to work.

In this situation, Rowntree (1902) recognizes that child poverty is not necessarily due to orphanhood, but is also directly related to the father's salary and the number of children in the household.

According to Unicef (2004), concern about children's poverty and living conditions was rekindled in 1919 with the creation of the Save the Children Foundation, which focused on helping children who were vulnerable as a result of the wars in Europe. In 1924, the Geneva Declaration on the Rights of the Child laid the legal and political foundations of the international human rights approach to the welfare and protection of children worldwide.

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"Although international efforts are important, the reality is that, according to Unicef (2004), the economic, social and political situation for children is not positive, especially in developing countries. In this sense, a consensus has emerged among poverty specialists on the urgency of being able to measure the social and economic conditions of children in a different way from that used for the general population".

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Although international efforts are important, the reality is that, according to Unicef (2004), the economic, social and political situation for children is not positive, especially in developing countries. In this sense, a consensus has emerged among poverty specialists on the urgency of being able to measure the social and economic conditions of children in a different way from that used for the general population.

Thus, the logic of this proposal follows a basic principle: children are doubly vulnerable in terms of living in and escaping poverty —children depend on the social and economic infrastructure conditions that their families can provide them, and they also depend on the infrastructure conditions that the State can guarantee them. In this sense, it is worth reviewing positions such as those of Tuñón and González (2013, p. 32), who point out that:

> Poverty exposes children and adolescents to multiple risks. Inadequate nutrition, an unhealthy environment, or the lack of emotional and intellectual stimulation in the first years of life affect the child's cognitive development and condition the exercise of many other fundamental human and social rights for the development of their maximum potential.

Authors such as Minujin et al. (2006, p. 16) state that "uneducated, malnourished and poor children inevitably become uneducated, malnourished and poor adults".

According to Unicef (2004; 2014), the appearance of the text *Child poverty in the developing world* (Gordon et al., 2003) was the culmination of the theoretical and methodological discussion on how to measure child poverty. This text clearly points out that poverty deprives children of their most basic rights and creates a physical and mental vulnerability in them, which is detrimental to their physical and intellectual capacities. In their text, Gordon et al. (2003) provide a conceptual overview of different definitions of poverty, ranging from the unidimensional approach, where income is the main variable, to more recent definitions that incorporate issues related to rights and human development. In this sense, they point out that child poverty must be accompanied by two components: vulnerability and deprivation. This has been also reviewed in the work of Petit (2003), Mari y Mari (2012), Laverde et al. (2019) and Omotoso et al. (2020).

However, it is important to note that terms such as *child poverty*, *childhood poverty*, *children living in poverty*, *child poverty*, and *child deprivation* are encompassed

by the concept of *child poverty* (Minujin et al., 2006), which is defined by organizations such as the Center for Child Poverty and Policy Research (CHIP, 2004, p. 1) as "children and youth who grow up without access to the various types of resources that are essential for their well-being and for achieving their full potential". Resources include economic, social, cultural, physical, environmental and political assets.

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Gordon et al. (2003) point out that child poverty is defined by the low standard of living in their immediate environment, and the lack of resources throughout their lives (due to low household income). Even the authors themselves criticize that child poverty measures do not escape the bias of conventional poverty measures, in the sense that a very low income, but with acceptable environmental conditions, would represent a non-poor status. It is therefore important to point out that some of the indicators used by Unicef (2004) to measure child vulnerability and poverty depend heavily on the infrastructure of the state, and not on the conditions or income of the children's homes, such as access to water, school attendance or access to electricity, as well as access to health care.

However, the literature review found that most definitions of child poverty converge on three factors: multidimensionality, i.e., poverty is not solely attributed to the child's household income (Mahrt et al., 2020); deprivation, in the sense that it "draws attention to the circumstances surrounding children by projecting poverty as an attribute of the environment in which they live and grow up" (Unicef, 2004, p. 20); and vulnerability, in the sense that exposure to poverty in childhood has consequences in adolescence and adulthood (Fabrizi & Mussida, 2020).

Therefore, and after consulting the specialized literature, we dare to define, from our conception and from our experience in the field, child poverty as the sum of vulnerabilities that harm society as a whole, since its presence is a determining factor for children to survive in the newborn and breastfeeding stages, to live in physical and mental fullness and in the enjoyment of their most basic rights during their childhood, and to develop adequately to move on to their adolescence and adulthood.

Method

The study area consisted of four localities in the municipality of José María Morelos, Quintana Roo, Mexico: Dziuché, La Presumida, Sacalaca and José María

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Morelos. The sample survey was conducted during the second semester of 2019 and the first trimester of 2020, before the Covid-19 pandemic, and for the design of the survey was used the Bristol methodology (Gordon, et al., 2003) adopted by Unicef (2014), whose indicators were used to estimate the level of poverty with the methodology proposed by Bourguignon and Chakravarty (2003).

Regarding the design of the field instrument, Unicef (2014) establishes that the dimensions to be addressed in the field should be the following:

- Nutrition: Weight/age ratio; height/age ratio; and estimation and origin of calories consumed per day.
- Drinking water: Source of drinking water; availability of drinking water; and time of access to drinking water.
- Sanitation: Type of sewage system for disposal of excreta.
- Housing: Housing overcrowding index; Housing floor material; Housing wall material; and Housing roof material.
- Education: School attendance and number of years of schooling completed.
- Information: Access to electricity; Radio ownership; Television ownership; and Telephone ownership (Unicef, 2014).

At this point, it is important to note that in Mexico, the most recent study on child poverty conducted by the federal government dates back to 2014, in a joint document by Unicef and Coneval (2016), which explains that the data were obtained from the national censuses, population counts and the National Survey of Household Income and Expenditure in Mexico (ENIGH, 2014), and not from fieldwork using an instrument specifically designed to measure child poverty. The above does not necessarily detract validity or shortcomings of what was done by Unicef-Coneval, on the contrary, it sets a precedent and a starting point for a better and more complete analysis and data collection such as the one presented here, even at a more disaggregated geographical level and with a greater number of observations, since, for example, in the ENIGH 2014 (Inegi, 2015, p. 11); as described in its methodology for household selection, a total of eighty surveys were collected in rural households throughout Quintana Roo, while for this exercise 120 were collected in a single municipality, for a total of 271 children.

With the data collected, we proceeded to estimate poverty in Mayan children using the Bourguignon and Chakravaty (2003) index, which is given by:

$$P_\alpha^\theta (X, z) = \frac{1}{n} \sum_{i=1}^{q} \left[\sum_{j=1}^{m} a_j \left(s_{ij} \left(1 - \frac{x_{ij}}{z_j} \right) \right)^\theta \right]^{\frac{\alpha}{\theta}}$$

Where:
- X is the matrix of n cases with m dimensions
- z is the set of thresholds
- n is the total number of cases
- m is the total number of dimensions
- x_{ij} is the value of dimension j for individual i
- z_j is the deprivation threshold for dimension j
- s_{ij} is the function of the deprivation indicator, which it is defined as follows

$$S_{ij} \begin{cases} 1 \; si \; x_{ij} < z_j \\ 0 \; si \; x_{ij} \geq z_j \end{cases}$$

- a_j is the weight assigned to dimension j
- q is the number of people with deprivation in at least one dimension.
- α is the parameter that reflects the difference in intensity between the individual and the base threshold. This variable is considered an "inequality aversion", as it demonstrates the importance assigned to the poorest compared to those close to the poverty line.
- θ is the elasticity of substitution parameter of the distances of dimensions with respect to their thresholds. It defines the degree of equivalence transferred of units from one dimension to another, or from an individual with some degree of deprivation in one dimension to another individual with another degree of deprivation in the same dimension (Bourguignon & Chakravarty 2003; Gordon, et al., 2003; Unicef, 2014).

This formula was disaggregated to create a poverty indicator, resulting in two indicators for estimating the poverty gap (P_1 and P_{iq}). According to Unicef (2014) itself, the indicators should be estimated with "a $\theta=1$ and $\alpha=0$ for the poverty index; $\alpha=1$ for the calculation of poverty depth and $\alpha=2$ for the calculation of poverty severity". It is important to note that the scale for measuring the dimensions was coded with the following values: 1 = extreme deprivation, 2 = moderate deprivation, 3 = no deprivation.

Subsequently, table 1 was constructed, showing the value of each dimension X_{ij} for each case n and the deprivation threshold for each dimension ($zj = 3$, $\forall j$).

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Table 1. Dimensions with standardized values X_{ij}

Individuals	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5	Dimension 6
1	[1,3]	[1,3]	[1,3]	[1,3]	[1,3]	[1,3]
...	[1,3]	[1,3]	[1,3]	[1,3]	[1,3]	[1,3]
n	[1,3]	[1,3]	[1,3]	[1,3]	[1,3]	[1,3]
Z_j						

Source: Own elaboration with support from Unicef (2014).

Subsequently, table 2 was constructed to illustrate each case and dimension under the assumption of $S_{ij} \begin{cases} 1 \ si \ x_{ij} < z_j \\ 0 \ si \ x_{ij} \geq z_j \end{cases}$ to then aggregate the number of moderate and extreme Sikh deprivations by dimension, and the aj weight was calculated for each dimension sum (Bourguignon & Chakravarty, 2003; Gordon, et al., 2003; Unicef, 2014):

$$a_j = \frac{W_j}{\sum_j^m = 1 \ W_j}$$

$$W_j = 1 - \frac{q_j}{n}$$

$$q_j = \sum_{i=1}^{n} S_{ij}$$

Table 2. S_{ij} Privatization

Individuals	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5	Dimension 6
1	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
...	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
n	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]

Individuals	Dimension 1	Dimension 2	Dimension 3	Dimension 4	Dimension 5	Dimension 6
q_i	[0,n]	[0,n]	[0,n]	[0,n]	[0,n]	[0,n]
w_i	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
a_i	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]

Source: Own elaboration with support from Unicef (2014).

Table 3 shows the T-gap$_{ij}$ of poverty for each dimension, multiplied by the deprivation indicator per case and dimension under the following form (Bourguignon & Chakravarty 2003; Gordon, et al., 2003; Unicef, 2014):

$$T_{ij} = S_{ij}\left(1 - \frac{x_{ij}}{z_j}\right)$$

Table 3. Deprivation gaps T_{ij}

Individuals	Dimension 1 Gap	Dimension 2 Gap	Dimension 3 Gap	Dimension 4 Gap	Dimension 5 Gap	Dimension 6 Gap
1	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
...	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
n	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]

Source: Own elaboration with support from Unicef (2014).

Subsequently, the gap per dimension was weighted in terms of αj and summed in case the individual presents at least one deprivation situation of any dimension under the following equation:

$$\sum_{j=1}^{m} a_j\left(s_{ij}\left(1 - \frac{x_{ij}}{z_j}\right)\right) = \sum_{j=1}^{6} a_{j\,Tij} = P_i$$

Where P_i is the individual poverty index that will take a value of 1 if the individual is poor or 0 if not. Thus, table 4 is fed by the calculation of the weighted gap given by Bourguignon and Chakravart (2003), Gordon et al. (2003), and Unicef (2014):

$$a_j\,T_{ij} = a_j\left(s_{ij}\left(1 - \frac{x_{ij}}{z_j}\right)\right)$$

Table 4. Weighted gaps and calculation of P_i

Individuals	Dimension 1 Weighted Gap	Dimension 2 Weighted Gap	Dimension 3 Weighted Gap	Dimension 4 Weighted Gap	Dimension 5 Weighted Gap	Dimension 6 Weighted Gap	$P_i = \sum T_j A_j$
1	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
...	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
n	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]

Source: Own elaboration with support from Unicef (2014).

Finally, four indicators were estimated: the extreme and total child poverty head-count index, given by P_0^1 the depth index of extreme and total child poverty, given by P_1^1; the child poverty gap ratio among the poor, given by P_{1q}^1; and the severity index of extreme and total child poverty, given by P_2^1. Thus, in table 5 are the estimates of the three indicators with the final indicators. In the first instance on the overall population and then only on the population in poverty (Bourguignon & Chakravarty, 2003; Unicef, 2014). In this sense, the individual poverty indicators are given by:

$$P_{i0} = \begin{cases} 1 \ si \ P_i > 0 \\ 0 \ si \ P_i \leq 0 \end{cases}$$

$$P_{i1} = a_j \ T_{ij}$$

$$P_{i2} = (a_j \ T_{ij})^2$$

While the aggregates were estimated as follows (Bourguignon & Chakravarty, 2003; Gordon, et al., 2003; Unicef, 2014):

$$P_0 = \frac{1}{n} \sum_{i=1}^{n} P_{i0}$$

$$P_1 = \frac{1}{n} \sum_{i=1}^{n} P_{i1}$$

$$P_{1q} = \frac{1}{q} \sum_{i=1}^{n} P_{i_1}$$

$$P_2 = \frac{1}{n} \sum_{i=1}^{n} P_{i_2}$$

Table 5. Calculation of indices at the individual level P_{i0}, P_{i1} y P_{i2}

Individuals	P_{i0}	P_{i1}	P_{i2}
1	[0,1]	[0,1]	[0,1]
...	[0,1]	[0,1]	[0,1]
n	[0,1]	[0,1]	[0,1]
α	[0,2]	[0,2]	[0,2]
Pα over total population	[0,1]	[0,1]	[0,1]
Pα on the poor	-	[0,1]	[0,1]

Source: Own elaboration with support from Unicef (2014).

Results and discussion

Next, the summary tables are presented. That is, only the headers and rows with summations or coefficients used in other matrices will be presented.

Table 6 shows the dimensions with standardized variations, called X_{ij}. This table shows the averages of the sub-dimensions of each indicator proposed by Unicef (2004), with the purpose of obtaining the deprivation threshold j. According to the Guide for estimating poverty, the threshold will be represented by Z_j with a value of 3 (no deprivation).

Table 6. Dimensions with standardized values X_{ij}

Individuals	Nutrition	Water	Housing	Sanitation	Education	Information
1						
...						
271						
Z_j						

Source: Own elaboration with support from Unicef (2014).

Table 7 shows the deprivations S_{ij} for each case and dimension. Once these values are established, the number of moderate and extreme deprivations per dimension (tables 8, 9 and 10) are summed to calculate *qj*, *wj* and *aj* for each dimension.

Table 7. S_{ij} Privatization

Individuals	Nutrition	Water	Housing	Sanitation	Education	Information
1	1	1	1	1	1	0
...						
271	1	1	0	1	0	1
q_i	234	131	113	138	32	207
w_j	0.14	0.52	0.58	0.49	0.88	0.24
a_j	0.0479	0.1815	0.2049	0.1725	0.3099	0.0830

Source: Own elaboration with support from Unicef (2014).

Table 8. Deprivation gaps T_{ij}

Individuals	Nutrition deprivation gap	Water deprivation gap	Housing deprivation gap	Sanitation deprivation gap	Deprivation gap in education	Information deprivation gap
1	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
...	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
n	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]

Source: Own elaboration with support from Unicef (2014).

Table 9. Weighted gaps and calculation of P_i

Individuals	Weighted nutrition gap	Weighted water gap	Weighted housing gap	Weighted sanitation gap	Weighted education gap	Weighted information gap	$P_i = \sum T_j A_j$
1	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
...	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]
n	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	[0,1]

Source: Own elaboration with support from Unicef (2014).

Table 10. Calculation of indices at the individual level P_{i0}, P_{i1} y P_{i2}

Individuals	P_{i0}	P_{i1}	P_{i1}
1	[0,1]	[0,1]	[0,1]
...	[0,1]	[0,1]	[0,1]
n	[0,1]	[0,1]	[0,1]
α	[0,2]	[0,2]	[0,2]
Pα over total population	0.8634	0.1259	0.0226
Pα on the poor		0.1458	0.0262

Source: Own elaboration with support from Unicef (2014).

The results obtained from the indices proposed by Bourguignon and Chakravarty (2003), by applying the methodology proposed in the *Guide for estimating child poverty* are:

- Extreme and total child poverty headcount or incidence rate: $P_0^1 = 0.863$.
- Depth index of extreme and total child poverty: $P_1^1 = 0.125$.
- Child poverty gap ratio among the poor: $P_{1a}^1 = 0.145$.
- Severity index of extreme and total child poverty: $P_2^1 = 0.022$.
- Poverty severity index on the poor = 0.026.

According to the Unicef manual (2014) and the text of Bourguignon and Chakravarty (2003), a poverty headcount index of 0.863 indicates that there are many cases that can be considered in extreme poverty, that is, this indicator takes into account the proportion of individuals, as in this case, or households that can be identified as poor; a poverty depth index of 0.125 indicates that, although the number of extremely poor children is high, the dimensions in which there are deprivations are not so deep, since this indicator "distributes the gap (amount and degree of deprivations = among the total set of individuals or households (poor and non-poor)" (Unicef, 2014).

The child poverty gap quotient of 0.145 indicates that deprivations in dimensions where only those classified as poor are not so deep, i. e., it could be said that they are close to overcoming the poverty gap. Finally, the severity indices, as stated in the Unicef manual (2014), take the deprivation values of each dimension of each individual in the "weighted sum of the distance that exists between

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the individual and the threshold [...] The value obtained is summed among all the poor and then divided by the total population"; that is, in both cases, with values of 0.022 and 0.026, the severity conditions in child poverty and poverty among the poor, respectively, are low.

As stated in the theoretical discussion and in the results, it is evident that in the Mayan child population of Quintana Roo, although there are signs of poverty and vulnerability, this, according to estimates, finds its severity especially in conditions related to the income of their homes and not to the infrastructural conditions that the Mexican and Quintana Roo State offer them. In other words, a large part of the deprivations documented and collected in the field are related to issues such as food or access to information, including the digital divide, while issues such as access to education and health seem to have been resolved, at least in terms of infrastructure. Much can be questioned about the quality of the aforementioned areas and future analyses can be made about them —this is undeniable and unquestionable. However, the evidence collected shows that the infrastructure, which is the minimum floor, is present. Its degree of functionality will be the subject of other studies in the future.

In fact, the above assertion is supported by the observation of the results, i.e., the deficiencies presented by the Mayan children of Quintana Roo are not so deep. Even with the interpretation of the indicators it could be thought that some of them are in the process of being solved, especially those that correspond to the State to provide. Nonetheless, the picture is not so encouraging when we look at the data on the current income of the households surveyed, because there the problem is far from being solved. In other words, we have a population of Mayan ethnicity that is impoverished in terms of income, in a rampant process of de-peasantization, and at the expense of the conditional cash transfers that governments can grant them. It would also be interesting to carry out more empirical fieldwork

like this in other parts of Mexico to know the extent of the poverty and vulnerability to which Mexican children are exposed.

Acknowledgments

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