



Linking child labour, schooling and child wellbeing

An exploration of the relationship between child labour, school attendance and child well-being among children in cocoa-growing households in Côte d'Ivoire.

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Executive summary

An estimated 1.56 million children aged 5-17 were involved in cocoa-related child labour – notably, work “that is harmful to physical and mental development”¹ – in Côte d’Ivoire and Ghana in 2018/9. Whilst all forms of child labour should be eliminated, children’s working conditions and overall situation may not be the same. Their family situation, degree of exposure to work and access to essential services like healthcare and education differs widely. As a result, working is likely to lead to very different short- and long-term consequences for each child’s health, development and wellbeing.

So how best to protect children from harm and support them to reach their full potential? We argue that it is necessary to have a nuanced understanding of the factors that can protect and harm working children, beyond the binary categories of “*in child labour*” or “*not in child labour*”. We refer to this as the *severity* of a child’s situation. This can help determine how urgently a child needs assistance, and what type of support. It can also help us measure progress in reducing children’s exposure to harm and improving their wellbeing.

This study investigates whether, in the context of smallholder farming in cocoa-growing areas of West-Africa, children’s psychological wellbeing (a proxy for the child’s physical and mental health) and access to school are linked with the **intensity of exposure to child work**, one of the several determinants of severity of child work.

We use data from a survey of 2,274 children in 5 cooperatives in the regions of Gbôklé, Nawa and San-Pédro, Côte d’Ivoire, which included information about children’s family situation, education, work, and wellbeing to answer the following questions:

1. How is children’s work, and its intensity (e.g. the number of hours worked), linked to children’s wellbeing?
2. How is schooling linked to children’s wellbeing?
3. How does a combination of schooling and child work affect children’s wellbeing?

To measure children’s psychological wellbeing, we used the *WHO-5 wellbeing index*, which to our knowledge, was also tested for the first time in the West-African context during this study. This was found to be suitable and easy-to-administer tool to assess children’s psychological wellbeing in these communities.

¹ ILO. For the full definition, see [What is child labour?](#)

Findings

The results show a *positive* relationship between school attendance and wellbeing and a *negative* relationship between child labour and well-being. **Being in child labour, working longer hours and missing school were all related to lower levels of child wellbeing:**

- Children doing *any type of work* had lower levels of wellbeing than non-working children.
- Children *working in agriculture* had lower levels of wellbeing than children doing non-agricultural work
- The greater the *intensity* of work, the lower the child's wellbeing score – for each additional hour worked on a weekday, children's wellbeing decreased. However, there was no statistically significant relationship between wellbeing and hours worked *during the weekend*. Children doing *hazardous work* had lower levels of wellbeing than those doing non-hazardous work, but there was *no significant relationship between the number of hazardous tasks* undertaken and child wellbeing.
- *School attendance* was associated with higher levels of wellbeing. Children in school generally had higher wellbeing scores than children out of school, while school attendance appears to play a protective role against the harmful influence of work on child wellbeing.
- The protective role of school faded when the number of hours worked during the weekdays increased.
- There was no significant difference between the wellbeing scores of children who do limited amounts of work and attend school and those who do not work. However, *over a threshold of three hours in total during schooldays, children's wellbeing scores decrease with each additional hour worked.*

Key take-aways

The results discussed in this paper are correlations and not causal relationships. However, they provide insights into factors that may *contribute* to harm, on the one hand, and may *prevent* harm, on the other. **Child wellbeing appears to be a good proxy for assessing the extent to which exposure to work is linked to harm**, and therefore when child work becomes child labour.

The findings of this study demonstrate that **the severity of child work – the extent to which it causes harm – is determined by both detrimental factors** (such as the type, the context, timing and duration of work) **and protective factors** (such as access to school). **These factors (or determinants of severity) interact, affecting the likelihood of harm.** This suggests that **work can be harmful to children in two ways: directly**, due to the physical and mental burden of working; and **indirectly**, by limiting children's access to the stimulation and protection offered by school.

These results underline the need to take into account the *context* in which a child is working, to better understand the severity of a child's situation. This includes:

- **School attendance** – School seems to play a protective role against the negative effects of work on children's wellbeing, and children enrolled at school have systematically higher wellbeing scores than out-of-school children. However, passed the threshold of 3 hours in total during the school week, this protective effect remains, but starts to fade.
- **The intensity of work** – Intensity, measured as the number of hours a child works, appears to be an important determinant of harm, but not the number of hazardous tasks.
- **Different types of work** – All types of work, including household chores, agricultural and non-agricultural work, contribute to the total burden on a child. After a certain threshold (between 3 and 10 hours during the school week, depending on the school status of the child), **children's wellbeing decreases with every additional hour worked, regardless of the type of work.**

Being “in child labour” is already an indication of risk to a child’s health, education and development. By accounting for additional factors – such as school attendance and the intensity of all types of work – we can better identify children at the highest risk of harm and ensure they are prioritised for support. These findings point to the importance of efforts to reduce the number of hours children spend doing many types of work, as well as efforts to take children “out” of child labour completely.



Introduction

There is a well-established body of literature demonstrating that schooling, wellbeing and child labour are interlinked.² However, most of these studies use binary indicators of “in” or “out of” child labour.

This study examines the relationship between children’s subjective well-being, access to school and the intensity of child labour in cocoa-growing areas of Côte d’Ivoire. To understand the *intensity* of child labour, we examine the number of hours worked in the past seven days, as well as the number of hazardous tasks undertaken by the child. We also examine whether access to school mediates the relationship between child labour intensity and psychological wellbeing.

We use data from a survey of 1,607 cocoa growing households carried out in February 2021 in five cooperatives of Côte d’Ivoire located in the regions of Gbôklé, Nawa and San-Pédro, which includes interviews with 2,274 children aged from 5 to 17 years. To measure children’s psychological wellbeing, we used the *WHO-5 well-being index* (Bech, 2012). We understand that this is the first time the tool had been tested in the West-African context.

Wellbeing is integral to the WHO definition of health³ and is defined in this paper as the individual’s subjective positive assessment of her/his own psychological and physical experience of life during the last two weeks. Children’s wellbeing has been shown to be negatively affected by child labour (Baryshnikova, 2020; Feeny, 2021), and several studies have shown the link between subjective well-being and future morbidity and mortality (Boehm & Kubzansky, 2012; Ashley Winning, 2015; Claudia Trudel-Fitzgerald, 2017).

Testing whether the intensity of exposure to child labour is correlated with wellbeing enables us to better understand one of several dimensions of the severity of child labour. Testing whether the wellbeing and access to school are significantly correlated with the intensity of child labour provides insights into the complex mechanisms that determine the extent to which child labour is harmful.

As an observational study, the results must not be interpreted as demonstrating causal relationships between the intensity of child labour, access to school and well-being, but rather as exploratory insights.

² See: International Cocoa Initiative (2021) *The effects of child work on health and education a review of causal evidence*, for a review of theoretic and empirical literature.

³ The World Health Organization’s definition of health stresses on the importance of well-being: “*Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*” (Constitution of WHO, 1946).

Method

Data

We conducted a field survey with a random sample of households, drawn from a total of 2,736 households on the registers of 5 cocoa cooperatives. The cooperative members were spread among 42 communities in three regions of Côte d'Ivoire: Gbôklé, Nawa, and San-Pédro. Data was collected in February 2021 from 1,600 heads of household, and all the children aged 5-17 years and present during the survey visit: 2,274 children in total.

This sample was designed to be representative of the households of these five cooperatives operating in three different cocoa-growing regions of Côte d'Ivoire.⁴

Following data cleaning, all 2,274 child records were retained for analysis. Extreme values regarding reported hours worked during the last 7 days were detected within this sample of children, with children reporting working more than 50 hours a week. For these 8 outliers, the number of hours worked was set to 50 hours to avoid excluding them and creating a selection bias.

Measurement

Child work, its nature and intensity were assessed through the child survey. Children were asked directly whether they had done any work, including in agriculture or in the cocoa fields, during the last 7 days. Children were asked about the number of hazardous tasks undertaken during the last 7 days and the last 12 months. Children aged 10 and above were also asked about the number of hours worked during the last 7 days overall and the number of hours spent doing hazardous tasks.

School attendance was assessed in the child survey, also through direct questions.

Children's wellbeing was assessed using the WHO-5 wellbeing index (Christian Winther Topp, 2015). The WHO-5 measures subjective psychological wellbeing, using five simple statements which are presented to the child about her/his positive mental and physical state over the past two weeks. It has been tested in several countries.⁵

Analysis

First, we addressed the potential issue of existing collinearity between the independent variables of this study to decide on suitable analytic pathways (see Annex 1). Then we tested the relative performance of a classical regression approach and of a multilevel regression method accounting for the variation of the subjective psychological well-being scores at community and household level (see Annex 2). Based on these first steps,

⁴ The number of households surveyed in each cooperative was determined according to its respective weight among the farmers present in the registers (number of farmers from cooperative i = number of households in the cooperative's register / 2736 * 1600), then number of households for each community was determined according to its respective weight within the cooperative (number of farmers from community ij = number of households from the community in the cooperative's register / number of households in the cooperative's register * number of farmers from cooperative i).

⁵ See: [ICI Child Wellbeing Index \(WHO-5\) Guidance and Questionnaires](#)

we decided to include the interaction of work-related variables and school status in the linear regressions to deal with any collinearity and separate the respective effects of these variables.

We chose to conduct multilevel analysis, making the analysis less sensitive to unobserved variables possibly influencing scores at household level (the immediate child's environment, like parenting style, the stability of the family unit, existing conditions within the household, to mention but a few), beyond the tested indicators (hours worked, number of hazardous tasks performed, school status...), even when controlling for the age, the gender and the school status of the child.



Results

Descriptive analysis

Characteristics of the children

The average age of the 2,274 children included in this study was slightly below 10 years old. Boys make up 53% of the sample. Approximately a quarter of the children surveyed, 26.5% were out of school.

Children's participation in work

Among all children aged 5-17, 51% of the children reported having worked (including household chores) during the last 7 days. Girls were significantly more likely to have worked than boys (63.9% and 39% respectively, $p < 0.0001^{***}$). Conversely, no gender differences existed among the 25.19% children who declared having worked in agriculture during the same period. 17.15% of the children worked in cocoa during the last 7 days (significant gender differences: 13.4% of girls vs 20.44% of boys, $p < 0.0001^{***}$), while 15.96% reporting having done at least one hazardous task during the same period (no significant gender differences) and 25.72% during the last 12 months, with significant gender differences (23.5% for girls and 27.64%⁶ for boys, $p = 0.025^*$).

Older children were significantly more likely to report all types of work than younger children (see Table 1 below). Older children were also more likely to have been exposed to hazardous tasks during the last 7 days and the last 12 months (See Table 2 below).

Table 1: Children's involvement in any work, work in agriculture and work in cocoa, by age group.

	Children aged 5-11	Children aged 12-17	Statistical significance of the mean difference
Any work, <i>past 7 days</i>	38.0%	78.8%	$p < 0.0001^{***}$
Work in agriculture, <i>past 7 days</i>	15.8%	45.8%	$p < 0.0001^{***}$
Work in cocoa, <i>past 7 days</i>	9.9%	33.0%	$p < 0.0001^{***}$
Hazardous work, <i>past 7 days</i>	9.6%	29.9%	$p < 0.0001^{***}$
Hazardous work, <i>past 12 months</i>	16.4%	46.2%	$p < 0.0001^{***}$

⁶ The overall rates of involvement in hazardous child labour are substantially lower (about 10% points) than the estimates from the NORC study ("Assessing Progress in Reducing Child Labor in Cocoa Production in Cocoa Growing Areas of Côte d'Ivoire and Ghana", Sadhu, S., Kysia, K., Onyango, L., Zinnes, C.F., Lord, S., Monnard, A. and Arellano, I.R., NORC, 2020).

The average number of hazardous tasks⁷ undertaken by children working in agriculture was 1.84 for the last 7 days, and 1.98 for the last 12 months, there were some significant differences between genders and age groups, as shown in Table 3.

Table 2 : number of hazardous tasks undertaken during the last 7 days and the last 12 months by children working in agriculture, by age group and gender.

	Children under 12	Children aged 12 and over	Statistical significance of mean difference	Girls	Boys	Statistical significance of mean difference
Number of hazardous tasks last 7 days	1.68	1.98	$p = 0.07$	1.53	2.11	$p = 0.0002^{***}$
Number of hazardous tasks past 12 months	1.62	2.26	$p = 0.0001^{***}$	1.48	2.42	$p < 0.0001^{***}$

The duration of work during the last 7 days was assessed for children aged 10 years and above only (1,142 children), since children below 10 years old can struggle to provide reliable information about time.

Overall, children aged 10 and above worked for an average of 5.67 hours in the past 7 days⁸, of which 2.44 hours were during the weekend and 3.23 hours on school days. Older children (>12y) reported working longer hours during the last 7 days than younger children (6.75h vs 3.86h, $p < 0.0001^{***}$) and during school days (3.93h vs 2.05h, $p < 0.0001^{***}$), but no significant gender differences were observed. Among all *working* children, an average of 7.68 hours was spent working per week⁹, compared to 13.65 hours for children working in agriculture (including cocoa), and 0.28 hours for children working but *not* in agriculture. Among children working in cocoa, children spent an average of 14.10h working in total, which is interestingly equivalent to the threshold-value identified by several research studies beyond which child work has detrimental effects on schooling and child health, and therefore becomes child labour (Assaad, Levison, & Dang, 2010; Bezera, Kassouf, & Arends-Kuenning, 2009).

Among all working children, 21% had suffered an injury during the last 12 months¹⁰, with a significantly higher rate of injury among children working in agriculture (27.5% vs 13.7% for children not working in agriculture, $p < 0.0001^{***}$), among children reporting hazardous tasks (29.6% vs 16.46%, $p < 0.0001^{***}$), and an even higher rate among children working in cocoa (35.15% vs 12.97%, $p < 0.0001^{***}$)¹¹, as shown in Figure 1.

⁷ The following tasks from Côte d'Ivoire's national hazardous activity framework were assessed: land clearing, tree cutting, plot burning, hunting with a gun, logging, charcoal production, stumping, spraying insecticides, using shape tools, digging holes, driving motorized vehicles, carrying heavy loads, working at night, working long hours.

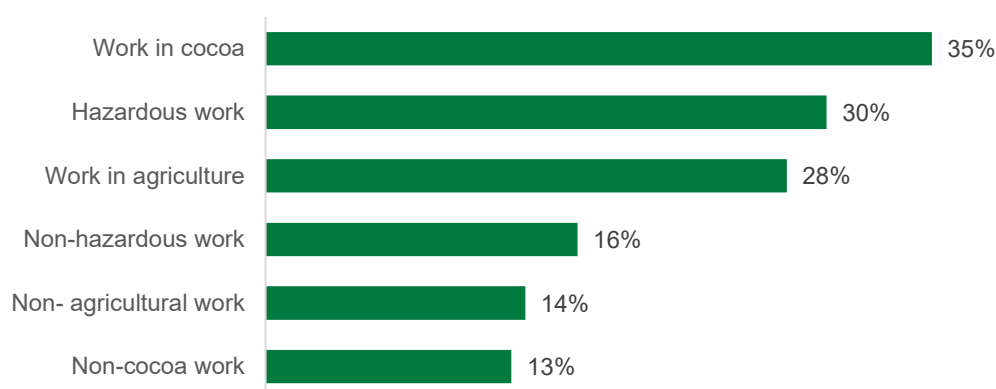
⁸ The NORC study reports an average of 5.86 hours worked over the last 7 days (Sadhu, 2020).

⁹ The NORC study reports 7.7 hours worked on average among working children (Sadhu, 2020).

¹⁰ These include mainly hand/arm and foot/leg injuries.

¹¹ The NORC figures are slightly higher, with an average of 31% for all working children and 41% for children working in cocoa (Sadhu, 2020).

Figure 1: Percentage of working children reporting injury due to work, by type



Almost three quarters of the children interviewed (73%) were attending school, with no significant difference across genders, nor between the under 12 age group, and those aged 12 and above. There was also no statistically significant difference between school attendance rates of children working in cocoa and children who did not.

Child wellbeing

Children's psychological wellbeing scores were calculated using the item response theory (IRT) method (see Annex 3). Scores ranged from -3.55 to 1.55, with a mean around 0¹² (the higher the score, the higher the child's wellbeing), and the WHO-5 appeared to be suitable to measure psychological well-being in this context.¹³

Average scores for girls were slightly below the mean of zero, and for boys slightly above zero, but this difference was not significant. Conversely, older children displayed significantly lower wellbeing scores than younger children (>12y: -0.11; <12y: 0.05, $p < 0.0001^{***}$)¹⁴, a difference which was observed for both genders. Likewise, children not attending school had lower well-being scores than children in school (-0.07 vs. 0.022, $p = 0.03^*$).

¹² The IRT score follows a standard normal distribution, with 95% of the values falling between -2 and 2.

¹³ The degree of wellbeing reflected by the responses of each item (their difficulty) increased systematically across the five responses (from "never" to "all the time"), which is consistent with the idea of a continuous scale measuring high level of well-being when the response to an item is high. The capacity to discriminate between children with lower or higher levels of well-being also varied across the items but was never negative. This is consistent with the idea that the scale is able to assess a continuum of children with low and high traits of well-being, while accumulating valuable information all over the questions. Therefore, there was no reason to suspect that the scale was unsuitable for this population, for example due to cultural specificities.

¹⁴ When used as a control variable in a regression analysis (see next section), age was consistently negatively correlated to children's well-being, with each year reducing the score by about -0.02 points.

Analysis of the relationship between wellbeing, exposure to work and school status

We analysed the relationship between work, school attendance and wellbeing using multilevel regressions. We controlled for the age, gender and school status of the child, as well as accounting for the variation of the wellbeing scores between children in different communities and households.

Child wellbeing and work status

Working children had lower wellbeing scores by -0.079 points ($p = 0.05^*$), **as did children working in agriculture** by -0.089* points ($p = 0.025^*$). There was no statistically significant relationship between child work in cocoa and wellbeing.¹⁵

Doing hazardous work during the last 12 months was significantly correlated with lower wellbeing scores of -0.14 points ($p = 0.05^*$). However, no significant correlation was observed for hazardous work during the last 7 days, nor the number of hazardous tasks undertaken (either during the last 7 days or last 12 months), nor whether children reported a work-related injury during the last 12 months.¹⁶

School attendance, child well-being, and hours worked

When looking at the relationship between well-being and **hours worked, school attendance** and their **interaction**¹⁷ for children aged 10 and over¹⁸, **school attendance by itself is significantly correlated with higher wellbeing** (0.2, $p = 0.005^{**}$), while the **interaction** of school attendance and hours worked during weekdays is **significantly correlated with lower well-being scores** (-0.017, $p = 0.027^*$). Conversely, hours worked during weekdays **alone** (outside their interaction with school status) are not statistically significant.

Out-of-school children have lower well-being scores than children attending school. Among children attending school, each hour worked during weekdays decreases their wellbeing score.

In other words, **out-of-school children have lower average well-being scores than children attending school** by 0.20 points, while, **for children attending school, each hour worked during weekdays decrease their wellbeing score by 0.017 points**. The same patterns hold true for children working in cocoa.

Figure 1 provides more insight in these results by displaying the relationship between well-being scores and hours worked during the weekdays, for out-of-school, children at school and for the average of these two groups.

First, the **protective role of attending school** appears clearly, whatever the number of hours worked. Out-of-school children (green line) are always below the mean of well-being scores (below 0) and display the most unfavourable balance between well-being scores and hours worked (the green line shows a trend, which is mostly below the average, represented by the red dashes). Conversely, children at school (blue line) always

¹⁵ These results remain stable even when dropping school status from the equation.

¹⁶ These results remain stable even when dropping school status from the equation.

¹⁷ Concretely this interaction refers, on the one hand, to hours worked in addition to attending school (children at school), and, on the other hand, to hours worked by out-of-school children, after taking into account the “effect” of school status and hours worked alone.

¹⁸ Only children aged 10 and over were asked questions about working hours, since navigating time and providing reliable information about it is very difficult for younger children in the context of a questionnaire.

have higher scores of well-being than out-of-school children and are slightly better off than the average (the blue line is above the red dashes).

Second, we can see a general pattern in the relationship between hours worked and well-being: the more the hours worked (during the weekdays), the less the child's well-being. However, in line with previous studies **limited amounts** of work on weekdays seem correlated with higher wellbeing scores, which **supports the idea that work may have a positive effect on the child wellbeing below a certain threshold**.¹⁹ This threshold is very low for child at school (up to 3 hours in total during the school week), compared to about 10 hours for out-of-school children, likely due to the time-conflict between work and school, leading children attending school to be overburdened sooner (see considerations just below). This complex relationship may explain why working hours during weekdays alone is not significantly correlated to child wellbeing scores and highlights the importance of **when** and **in which context** exposure to work occurs when it comes to assessing severity, these two other determinants of severity interacting with the intensity of work. In line with this, we see no significant relationship between the total number of hours worked (all types of work) during the last 7 days and well-being scores. Nor do we see a significant relationship between hours worked during the weekend.

The protective role of school and the number of hours worked for children at school

To make a better sense of the dynamic between wellbeing, hours worked and school status, we looked at how the degree of protection provided by being at school varies when the number of hours worked during weekdays²⁰ increase. Figure 2 shows that, after a narrow window of positive interaction (between 0 and 3 hours), the effect of attending school on the child's psychological well-being drops, certainly due to the **overload** exerted by both working hours and school hours. That is, below the threshold of 3 hours worked in total during weekdays, the average level of protection of being at school falls below the average mentioned above (0.2 additional points to well-being scores).

¹⁹ See for example: (Assaad, Levison, & Dang, 2010; Bezera, Kassouf, & Arends-Kuenning, 2009; Ranjan & LANCASTER, 2005; Delprato & Akyeamong, 2019).

²⁰ To capture the variation of the protective effect of school status on well-being, we used the properties of multilevel regression and let the effect of hours worked and school status vary for each child, then determined their respective effect coefficient for each child. Interestingly, the effect of hours worked did not vary across the children, whereas the effect of school status did vary greatly.

Figure 2: Child wellbeing scores and hours worked on school days, by school status

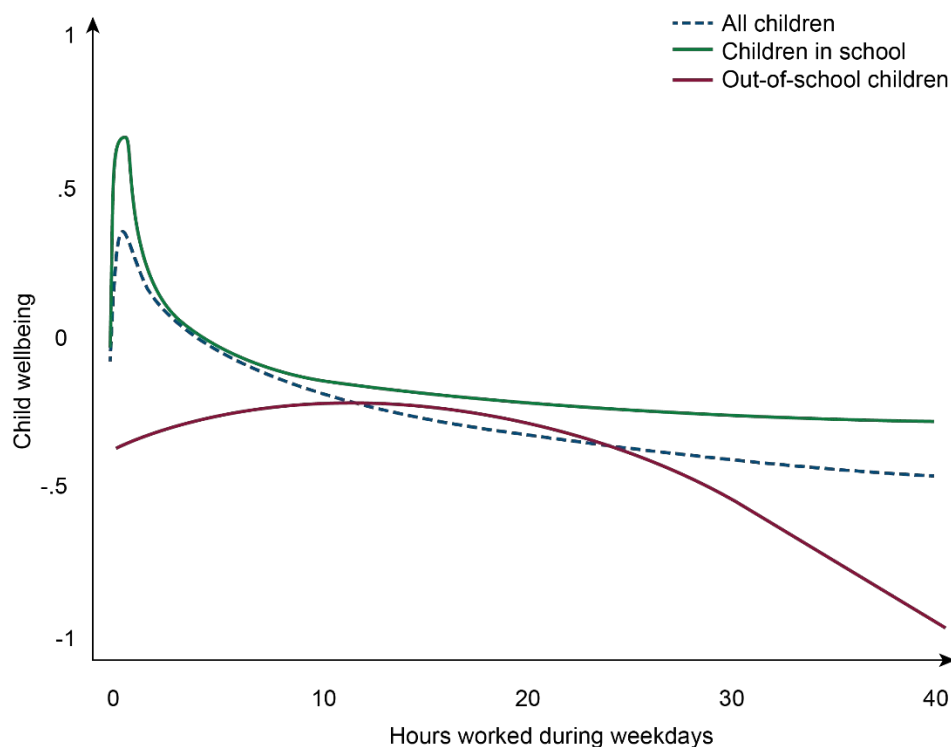


Figure 2: Variation of the effect of school attendance on well-being depending on the number of hours worked during school days, for children at school

Using child wellbeing to understand the severity of child labour

The severity of child labour – by which we mean *the extent to which it causes harm* – is a multidimensional concept, which makes it difficult to capture.

This study examined several (but not all) dimensions that might help us understand this better:

- **Child outcomes** that could be affected by child labour: here, *child wellbeing*
- **The type and intensity of work:** here, *work status, exposure to hazardous work (eg. hours and days), the number of hazardous tasks undertaken, and hours worked*

- **The timing, the context and the presence / absence of protective factors:** when do working hours occur during the week (weekday, weekend)? Is the child exposed to work *and* going to school? Protective effect of attending school.
- **Child characteristics:** here, *age* and *gender*

We explored the relationship between different types of child work and work intensity, and child wellbeing; how school attendance relates to child wellbeing and how school attendance and work intensity interaction relates to wellbeing.

Our analysis shows that **school attendance was consistently correlated with higher child wellbeing**, suggesting that **attending school could be a protective factor**. Consequently, wellbeing scores of out-of-school children are always lower than for children in school.

Working longer hours was associated with lower child wellbeing for children attending school. More specifically, when children combine work and school, schooling has a clear protective “effect”. Up to 3 hours of work this protection seems even stronger, but beyond this threshold, the protective effect fades, and wellbeing decreases. For out-of-school children, the threshold is higher (around 10 hours), but their scores remain systematically lower than children at school, i.e. their wellbeing is affected **both** by being out of school and the amount of hours worked. It is very likely that the strong negative relationship between being deprived from school and well-being hides the negative link between hours worked and well-being. These findings add to other research studies which showed that child work has a negative effect on school attendance or attainment (Assaad, Levison, & Dang, 2010; Beegle, Dehejia, Gatti, & Krutikova, 2009; Zabaleta, 2011; Delprato & Akyeampong, 2019), which in turn may affect the health or wealth of the child and the future adult (Lee C. a., 2010; Nishijima, Souza, & Sarti, 2015).

While there are some differences between the wellbeing scores of children involved in different types of work, **the intensity of work appears to be more strongly associated with wellbeing than the type of work.**

This finding is in line with national legislation and international conventions which promote age-appropriate “light work” that does not interfere with schooling.²¹ Overall, **we see that hours spent doing all types of work or activity** – in cocoa, other types of agriculture, household chores and other work, but also academic activities – **accumulate and may be associated with lower wellbeing beyond a threshold, where the overall load on children is too much.** In other words:

- For out-of-school children, the activity load is determined by *work only*
- For children at school, it is determined by school *activities* + *work*. This may explain why the threshold for hours worked during weekdays is lower for children attending school, and therefore why they are more quickly “overburdened” by fewer hours of work.

The findings of this study demonstrate that **the severity of child work is determined by both detrimental factors** (such as the type and duration of work) **and protective factors** (such as access to school). These factors interact, affecting the likelihood of harm.

Our analysis suggests that work can be harmful to children in two ways: directly, due to the physical and mental burden of working; **and indirectly**, by limiting children’s access to the stimulation and protection offered by school.

²¹ ILO, [What is child labour](#)

Where next?

These results underline the importance of taking into account the *context* in which children are working, to better understand the severity of their situation. This is relevant to ongoing efforts to identify children at risk of harm, provide appropriate support to prevent and address child labour, as well as to monitor progress.

Identification of children at risk and monitoring progress

Child labour monitoring and prevalence surveys should collect information to understand children's situations in a *holistic* way. Up-to-date and reliable information should be collected on:

- **School attendance**
- Children's **sex and age**, including the age a child first started working, which can be useful indicators of the likelihood of harm
- **Household chores** (which are often excluded from child labour surveys)
- The **total time** spent doing any work on weekdays, *including household chores*, work in agriculture and other work, but *only* for children aged 10 and above.²²

This information can be used both to target interventions based on need, as well as to measure incremental progress towards reducing harm.

In contrast, these findings suggest several possible ways of *shortening* child labour surveys:

- Since these findings suggest that information about the total number of hazardous tasks is of limited use to determine the likelihood of harm, consider carefully whether there is a need to question children about individual hazardous tasks in all types of data collection.
- Avoid asking questions about time spent on different types of tasks or work – capturing **total** hours worked is sufficient.
- Consider not asking questions about hours worked during weekends, since this information is also not a good predictor of harm.

Providing support to prevent and address child labour

Education is a fundamental child right, which is crucial to support children's healthy development. The findings of this study also underline **the positive effect of education in protecting children from some forms of harm**, even when they are exposed to risks like child labour. This is in line with the idea that school is a fundamental layer of the child's ecology (Bronfenbrenner, 1979), which can buffer the negative effect of other factors on the child's development (Vandenbroucke, Spilt, Verschueren, & Baeyens, 2017).

From an operational perspective, these results point to the need to:

- Support access to quality education for all children, regardless of whether or not they are in child labour.
- Help children to stay in school, especially girls and older children, who face competing demands on their time.
- Focus on *reducing the number of hours worked* by children, in addition to working towards the long-term aim of ending children's participation in all forms of harmful work.²³

²² Children under 10 struggle to report accurately on time, leading to challenges with data reliability.

²³ This is in line with other research studies which show that hours worked also negatively affect children's school attainment (Assaad, Levison, & Dang, 2010; Zabaleta, 2011; Bezera, Kassouf, & Arends-Kuenning, 2009).

Measuring progress and impact

In impact evaluations, consider including measuring wellbeing as an outcome. The *WHO-5 child wellbeing measure*²⁴ has been shown to be appropriate and practical to administer in cocoa-growing areas of Côte d'Ivoire and appears to capture several dimensions of the severity of child labour.

Gaps to be addressed in further research

This study identified several links between child labour, wellbeing and school attendance. However, its observational nature prevents us from drawing any causal conclusions from its results. Other limitations include:

- The data did not permit us to explore the relationship between work intensity and wellbeing among children under 10, since data was not collected from this age group.
- Several factors at child-level that may affect child psychological wellbeing were missing from this study, which would have offered a clearer picture of the relationships observed. These *confounders* include school performance, current level of stress, depression symptoms, presence/absence of disease.
- This study focuses on the link between the child's wellbeing, school attendance and work intensity at one moment in time. Therefore, no conclusions can be drawn about the relationship between work intensity and school attendance *over time*. This means it is hard to disentangle the respective effect of hours worked over the last 12 months and over the past 7 days on the current wellbeing of the child (for example to determine if the current state mirrors a longer- or a shorter-term exposure to work) nor can we understand the long-term relationship between higher intensity or constant exposure to work over a long period and child wellbeing.

Future research could help to draw causal conclusions from the relationships observed. One approach would be to set up a panel study to follow children for several years from the age they start school.

Finally, while child wellbeing appears to capture several dimensions of the severity of child labour, it is only a proxy. Further research is needed to explore the relationship between work, its intensity and *other dimensions* that shape children's ability to reach their full potential and their future as adults.

²⁴ [ICI, Child Wellbeing Index \(WHO-5\) – guidance and questionnaires](#)

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Annex 1: Multicollinearity analysis

The age, gender and school status of the child, as well as other independent variables related to the child's work activity (working status, number of hazardous tasks, hours worked), because of their potential collinearity, may hamper the analysis when it comes to defining their respective relationship with the outcome of interest (child's well-being, for instance). Multicollinearity was tested with two different methods (variance inflation factor and condition number). If the first method did not yield a concerning multicollinearity, the second did show a slight sensitivity of the results to collinearity, only when hours worked were among the control variables (age, gender, school status of the child).

To deal with collinearity, we included the interaction of work-related variables and school status in the linear regressions to separate their respective effects.

Annex 2: Selection of the regression method

Multilevel regressions were used to analyse the relationship since they consistently performed much better than linear regressions (BIC of linear regression = 2901 vs. BIC of the multilevel regression = 2616, for the regression including hours worked during the last 7 days, for example²⁵). Also, adding child work-related independent variables to the model improved greatly its performance (BIC = 2607) when compared to a model including only the age, gender and school status of the child (BIC = 5194).

Annex 3: Item Response Theory (IRT) fundamentals

Like other psychometric tools, the WHO-5 aims at measuring for each individual the degree of expression, or level, of a trait (the child's psychological well-being, for instance) which is *not directly observable*, but assessed *via* the responses of the individual to a series of items. Each item provides therefore an indirect and incomplete estimate of this unobserved ("latent") trait, as would the sum of the score of these items. The Classical Test Theory approach assumes that a score computed as the sum of well-selected items reliably reflects the degree of expression of the trait under observation for each individual. Conversely, for combining the items, Item Response Theory (SCHMIDT & EMBRETSON, 2012) takes into account the fact that items may depict situations of different levels of well-being (e.g., a fair or a very high level) or, in clinical assessment settings, different levels of severity (for example, reporting to have sleep disturbances – scored 1 – or to have suicidal thoughts every day – also scored 1 – in the same depression scale do not reflect the same level of severity), and each item may not as efficiently distinguish between individuals with high- or low-trait levels when passed with the maximum score (in our last example, sleep disturbance may equally correspond to mildly or highly depressive persons, who in either cases will have a poorly discriminating score of 1, but suicidal thought will only be selected by highly depressive persons). Therefore, a sum score of 5 in a 10-item scale may be attributed to persons in very different states and may lack informativity. Moreover, depending on the population from which the sample is drawn, the mean of the summed scores may vary dramatically (the average score of a depression scale will be much higher for psychiatric patients than for the general population), therefore these means are not comparable across different samples. To avoid these pitfalls, we used a scoring method based on Item Response Theory – IRT, which accounts for the degree of well-being reflected by the item (its *difficulty*²⁶), but also for the capacity of each item to discriminate between children with low or high trait of well-being: items reflecting higher levels of well-being are given more weight and produce higher scores. With an

²⁵ The lower the BIC, the more informative and efficient the model.

²⁶ To understand this notion of *difficulty*, it is helpful to remember that IRT was initially used in skill assessment, whereby answering more difficult questions reflects greater levels of skill.

IRT scoring method, the mean of the measured trait is 0, which makes the interpretation of the scores easier (negative scores correspond to a level of well-being below the mean, while positive scores correspond to a level of well-being beyond the mean).