
WOMEN'S EMPOWERMENT IN MALI

Impact evaluation of the educational project:
'Girls CAN – Promoting Secondary Education in
West Africa'

Effectiveness Review Series 2015/16



Fatimata sits in a classroom in a secondary school in Mali. Photo: Ami Vitale/Oxfam.

MARCELLA VIGNERI and SIMONE LOMBARDINI

OXFAM GB



CONTENTS

Contents	2
acknowledgements	3
Executive Summary	4
Evaluation design	4
Results	4
Project learning considerations	6
1 Introduction	8
2 Project description	10
2.1 Contextual background	10
2.2 Project activities	11
3 Evaluation design	13
4 Data	15
4.1 Sampling of intervention and comparison groups	15
4.2 Analysis of baseline characteristics	17
5 Measuring girls’ empowerment in Mali	19
6 Results	22
6.1 Introduction	22
6.2 Involvement in project activities	22
6.3 Women’s empowerment	23
6.4 Other outcome indicators	33
7 Profiling unidentified girls in the sample, and girls who dropped out of school	36
8 Conclusions	38
Appendix 1	39
Appendix 2: Methodology used for propensity-score matching	41
Appendix 3: Applying Coarsened Exact Matching to test Propensity Score Matching	45
Notes	48
References	49

ACKNOWLEDGEMENTS

We would like to thank Oxfam in Mali and local partner teams for being so supportive during this Effectiveness Review exercise. Particular thanks go to Sekou Doumbia (MEAL Coordinator, Oxfam in Mali), Aminata Ba (Regional Programme Information Coordinator, Oxfam West Africa Regional Centre), Bernadette Sadio (Regional Programme Officer, Oxfam West Africa Regional Centre), Toureba Keita (MEAL Programme Officer, Oxfam in Mali) and Almoctar Yattara (PHP Officer, Oxfam in Mali); Ulrich Zombre (Lecturer, McGill University, Department of Economics, Montréal, Canada) who provided excellent research assistant work; and Bocoum Hamadoun (Monitoring and Evaluation Specialist Initiative pour le développement de l'Afrique, Mali) who managed the fieldwork.

EXECUTIVE SUMMARY

Oxfam GB's Global Performance Framework is part of the organisation's efforts to better understand and communicate its effectiveness, as well as enhance learning across the organisation. Under this Framework, a small number of completed or mature projects are randomly selected each year for an evaluation of their impact. This exercise generates what are known as Effectiveness Reviews. The project 'Girls Can – Promoting secondary education for girls in West Africa' (MLIA83) was one of the projects selected in 2015/16 for an Effectiveness Review.

The overall objective of this project was to promote the successful transition of adolescent girls from primary to secondary school. This was achieved by rolling out a variety of activities to support the change from within the community. It was, therefore, aimed not only at girls, but also at all community members involved in the project (e.g. mothers, school directors and religious figures).

This Effectiveness Review has taken a particular analytical angle to look at one aspect of project impact, the empowerment outcome of girls, defined as an index combining several indicators of girls' material, physical and psychological empowerment, both in their personal (domestic) and social (school and community) space.

EVALUATION DESIGN

The Effectiveness Review took place in January 2016 in Koulikoro region (Kati circle) – Mali. It intended to evaluate the impact of the 'Girls Can – Promoting secondary education for girls in West Africa' project in promoting girls' empowerment and achieving its objectives: increasing school retention and transition from primary to secondary cycle. The evaluation adopted a quasi-experimental impact evaluation design comparing outcome indicators from a randomly selected sample of adolescent girls who had benefited from activities rolled out under the Oxfam project 'Girls Can', and compared them with girls sampled from a randomly selected number of comparison schools. The evaluation tailored the measurement tool Oxfam GB has developed based on a composite index, to measure this complex and hard-to-measure concept, first identifying what it means for a girl to be empowered in the context of south Mali, and then combining these dimensions it into a multidimensional index.

RESULTS

This evaluation found compelling evidence that the project, which was active between 2011 and 2015, had a positive impact on empowerment. In particular, the following key results were found:

- Girls in the intervention group scored positively in 70 percent of the 20 empowerment indicators whereas girls in the comparison group scored positively in 67 percent.
- 55 percent of project girls successfully moved on to secondary school, compared with 47 percent in the comparison group.¹
- Over three quarters of project girls made the transition to the grade they should be in, but there is no evidence that this is directly associated with project activities.
- School results are significantly better among project girls than among girls in the comparison group.
- Equitable treatment of boys and girls in school was found to be reported significantly more among girls in the intervention group than among girls in the comparison group.

Sections 2 to 6 will provide further details about the research questions specifically addressed for this review in relation to the wider set of project objectives, explain the research methods used, and present a disaggregated account of all the empowerment indicators.

Summary results of this Effectiveness Review

Outcome	Evidence of positive impact	Comments
Women's empowerment	Yes	The evaluation found a 3 percentage point difference in the empowerment index between girls from project schools and girls from comparison schools.
Schooling and transition	Yes	The evaluation found a difference of 7 percentage points in the transition rate to secondary school between girls enrolled in intervention schools and girls enrolled in comparison schools.
Mothers' income-generating activities and household income	No	The evaluation did not find any difference between project and comparison schoolgirls.
Time use	Yes	The evaluation found that project schoolgirls spent 0.06 hours more in school than comparison schoolgirls.

The summary table below outlines the different indicators of empowerment looked at under this review, showing whether there has been evidence of success (Column 5).

Summary results: Characteristics of girls' empowerment

(1) Level	(2) Dimension	(3) Characteristic	(4) Weight (%)	(5) Evidence of impact?
Personal	Power from within	Knowledge of their rights	4.5	No
		Desire to study	6.1	No
		Ambitions	-	No
		Knowledge of the advantage of education	-	Yes
		Knowledge of reproduction health	-	Yes
	Power to	Formal education	42.4	Yes
		Freedom from early marriage or pregnancy	7.6	Yes
		Self-confidence and personal autonomy	4.5	No
		Obtain good school results	-	Yes
		Freedom from gender stereotypes	-	No
Relational	Power with	Leadership	6.1	No
		Group participation	-	No
	Power over	Freedom from violence	-	No
		Ability to denounce violence	-	Yes

	Non-acceptability of sexual violence	-	Yes
	Material support from household (school equipment)	-	No
	Moral support from household (girls' needs)	15.1	Yes
Environmental	Family education	13.6	No
	Favourable environment	-	No
	Support from associations	-	Yes

PROJECT LEARNING CONSIDERATIONS

Some important lessons that can be applied to other projects of this type in Mali and elsewhere have emerged from this evaluation. Through a debrief process, the Mali country team has raised a number of reflections and learning points that are summarised below.

There was initially some reservation about whether the nature of this project could lend itself to an Effectiveness Review exercise under the 'Women's Empowerment' theme. The project did not pursue women's empowerment as one of its intended objectives, and the context in which the project was implemented was not considered conducive to the analysis of girls' empowerment. The following point was noted by the country team: the concept of empowering girls is often resisted by the parents of adolescent girls and by the wider communities, as this is a concept seen to 'import' other cultural values that can lead to losing control over the education of girls. This was felt to be the case especially in the context of the direct project beneficiaries – adolescent girls aged 9 to 12 years at the time the intervention started- who represent an age group for whom talking about 'empowerment' can be particularly sensitive in shaping their opinions. Despite this initial hesitation, however, the merit of anchoring the possible effects of project activities to girls' empowerment was soon recognised. The thematic relevance of the project to the issue of girls' empowerment emerged especially after a focus group discussion exercise was conducted at the onset of the Effectiveness Review with members of the AME (Association de Mères des Elèves) to qualify and fine tune the concept of girls' empowerment around those dimensions and indicators considered more relevant in relation to the project. The key result of the review – which suggests that project school girls are significantly more empowered than their counterparts in the comparison group of schools – also reinforced the point that the 'Girls Can' project had effectively added value to girls' empowerment, despite this not being an explicit intended outcome of the intervention.

The second consideration emerging from the review was around the value add of the project in the context of similar initiatives being rolled out in the country. Throughout the duration of the project, the intervention area (the Baguinéda CAP) had been heavily targeted by a variety of similar initiatives intending to promote girls' schooling under a national programme called SCOFI (Scolarisation et Formation des Filles). However, the evaluation revealed a number of areas where this specific intervention has made a positive and marked contribution: 1) a significant increase in project girls' transition rate to the secondary school cycle, 2) a significant increase in the amount of time project girls spend in school, and 3) three dimensions of empowerment: the 'Power to', the 'Environmental' and the 'Power within'.

The country team suggested that it would be important to build on the evidence emerging from the Effectiveness Review to document in greater detail what factors led to the success of the project in order to offer an influencing strategy to partners of the EPT coalition (Coalition Education Pour Tous). This would be particularly relevant to strengthen the influencing component of the 'Girls Can' project. Given that the new focus of the Oxfam Country Strategy

includes an important advocacy component for access to 'Essential Services', the lessons learned from this Effectiveness Review can be used to working effectively with the Coalition.

The Effectiveness Review also suggests the value of focusing future initiatives in promoting education to leverage change. The findings of the review usefully suggest which aspects of girls' empowerment need more attention – areas where adolescent girls are held back - and the team might find it helpful to use the framework of the three dimensions of power change noted above for future programme and policy efforts.

The MEL system put in place by the project has been effective, allowing most of the data needed to be acquired, although it was very focused on the donors' log frame, and the teams is encouraged to consider broader questions about what Oxfam can learn from its projects, beyond the contractual log frames and requirements set out by the donors.

Similarly, although the project initially set a partnership with government bodies, school management structures, and an advocacy organisation (the implementing partner, the Association d'Appui à l'Auto Développement Communautaire) to strategically facilitate changes at scale, there are questions on whether the influencing component of the project in this partnership has not been activated. This raised the question on how best Oxfam should manage its partnerships for influencing purposes.

Finally, while this Effectiveness Review identified both greater and more limited areas of success of the project, the evaluation design does not lend itself to understanding why some project activities were more successful than others. This could be an important area for follow-up research.

1 INTRODUCTION

Oxfam GB's Global Performance Framework is part of the organisation's effort to better understand and communicate its effectiveness, as well as enhance learning across the organisation. Under this framework, a small number of completed or mature projects are selected at random each year for an evaluation of their impact, known as an Effectiveness Review. One key focus is on the extent to which the projects have promoted change in relation to relevant OGB global outcome indicators.

This Effectiveness Review took place in January 2016 in the Koulikoro region in southern Mali, and intended to evaluate the success of the project 'Girls Can – Promoting secondary education for girls in West Africa' in supporting girls to achieve greater empowerment.

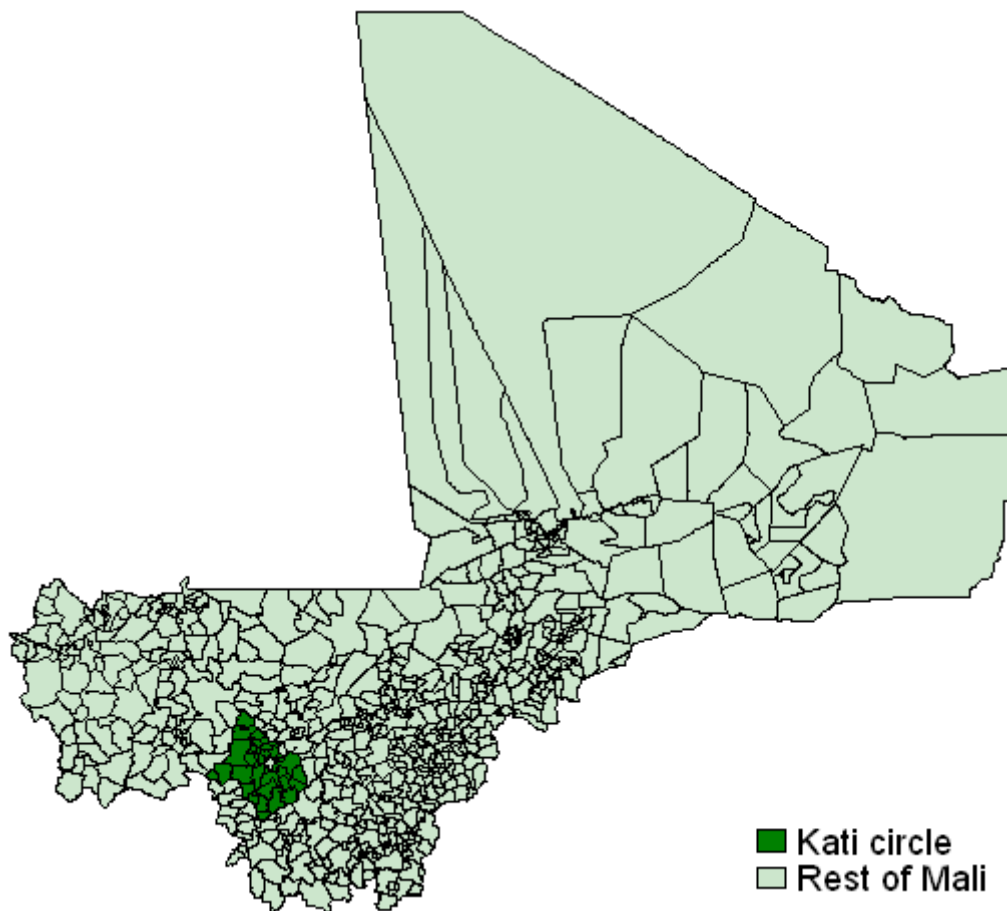
This project was selected under the Women's Empowerment Index OGB global outcome indicator. This is measured by a composite index of indicators of empowerment relevant to the socio-economic context of the project under analysis. The construction of the index is explained in Section 5.

The evaluation questions raised in this report are:

- What has been the project impact on promoting girls' empowerment?
- What was the project impact on school enrolment and school transition from primary to secondary school?
- What was the project impact in relation to other outcome indicators connected with the project logic?
- What was the project impact on girls' time allocation?
- What was the estimated drop-out rate of girls during the course of the project, and what were the main reasons for girls' dropping out of school?

The project was implemented by Oxfam in conjunction with the Association d'Appui à l'Auto Développement Communautaire (AADeC), a local NGO, in collaboration with the Centre d'Animation Pédagogique² (CAP) of Baguinéda, and the Ministry of National Education. It started in October 2011 in 17 primary schools and eight secondary schools, and ended in December 2015. The evaluation work conducted for this Effectiveness Review took place in January 2016.

Figure 1.1: Map of Mali with Kati circle highlighted



This report presents the findings of the Effectiveness Review. Section 2 briefly reviews the activities and the logic of the project. Section 3 explains the evaluation design, and Section 4 reports how the evaluation design was implemented. Section 5 introduces the tool for measuring girls' empowerment in the context of this project. The results from the data analysis, including descriptive statistics of the population surveyed and the differences in outcome measures between the intervention and comparison groups, are given in Section 6. Section 7 profiles unidentified girls in the sample, and girls who dropped out of school. Section 8 concludes with a summary of the findings and some recommendations for future learning.

2 PROJECT DESCRIPTION

2.1 CONTEXTUAL BACKGROUND

According to the Ministry of Education in Mali (le Ministère de l'Éducation de Base, de l'Alphabétisation et des Langues Nationales, or MEBALN), the country's enrolment rate in primary schools in 2009 was 72.3 percent for girls, and 90.4 percent for boys. The same source also reports a 46.8 percent completion rate for girls in primary school, and 63.6 percent completion rate for boys in the same school cycle.

The duration of mandatory education in Mali is nine years, and includes six years in a primary cycle, and three years in a secondary cycle. Unicef statistics³ provide a more general context to understand education levels in the country. The reported literacy rate is 56 percent among males, but drops to 39 percent among females (in both cases referring to youths 12 to 24 years old). The net⁴ enrolment ratio in primary school is almost 72 percent for boys and 63 percent for girls. The secondary school net enrolment ratio is 36 percent for boys but only 25 percent for girls.

These statistics are quite staggering, and suggest ample scope for improving school attendance and school performance in Mali. In order to support the country in meeting the 2015 Millennium Development Goal on education for all, and also to successfully achieve the organisation's strategic change on the theme of education, in 2008 Oxfam put in place an education programme based on the recommendations from an evaluation of the 'Regional Programme on Equitable Primary Education' (Programme Régional d'Éducation de Base Equitable) launched in 2000 in Burkina Faso, Ghana, Liberia, Niger, and Mali.

The programme in Mali initially introduced a number of activities focused on improving the sanitary conditions of schools, girls' scholastic performance, and the quality of school governance. The need to increase transition rates of pupils – particularly girls – to secondary school was subsequently identified as an additional area for policy action. For this reason, Oxfam – in partnership with the Union des Banques Suisses (UBS) and the Earth Malian Association d'Appui à l'Auto Développement Communautaire (AADeC), launched the Girls Can project in 25 schools (17 primary, and 8 secondary) in 2011.

Initially expected to last for three years, this project targeted 3,752 girls, 2,370 of which were in 17 primary schools in the circle of Kati, in the Koulikoro region. The overarching objective of the project was to increase by 50 percent the retention rate of girls in all 25 schools (in both the primary and secondary cycle), and also to increase by 30 percent the successful transition of girls from primary to secondary school.

The following changes were expected to take place in the life of project school girls:

1. That girls would be better educated and would acquire more marketable skills for the job market.
2. That girls would acquire more self confidence in talking in public and therefore would become more able to influence decision-making processes in public spaces and in the community.
3. An improvement in the level of girls' personal and sanitary hygiene practices in school and in the community.
4. A reduction in the incidence of girls' early marriage and early pregnancy.

5. An increase in the value given to girls' schooling and education among community members, and the promotion of actions to sustain girls' retention rates in school (for example through the provision of public transport and financial support).
6. An improvement in local community policies, including the provision of a budget for girls' education (for example through petitions to reinforce the capacity of civil society already working on the question of education in Mali).

At the onset of the project, a scoping study was carried out to identify the specific constraints on girls transitioning from the primary to secondary cycle of compulsory school. The scoping study identified a number of problems: the lack of monitoring of children's schooling (particularly girls), the existence of heavy family chores, baby-sitting demands on girls, parents' illiteracy, early marriages and pregnancies, instability of teenage life, and high incidence of poverty.

A baseline study conducted in March 2012 (shortly after the project started) also revealed that while the ratio between girls and boys was balanced enough within primary schools, in secondary schools the gender gap in school participation increased to 15–20 percent, and that exam pass rates decreased dramatically in key years (e.g. in 9th grade), when girls become more subject to social constraints (early marriages, participation in social rituals, being housemaids, etc.). For this reason the project targeted the following beneficiaries:

- a) 3,752 girls in 25 schools in the circle of Kati (direct project beneficiaries)
- b) students' mothers' associations (known as les Associations de Mères d'Elèves, or AME)
- c) committees for schools' management (known as les Comités de Gestion Scolaire, or CGS)
- d) teachers and communities of the 17 villages (project indirect beneficiaries).

2.2 PROJECT ACTIVITIES

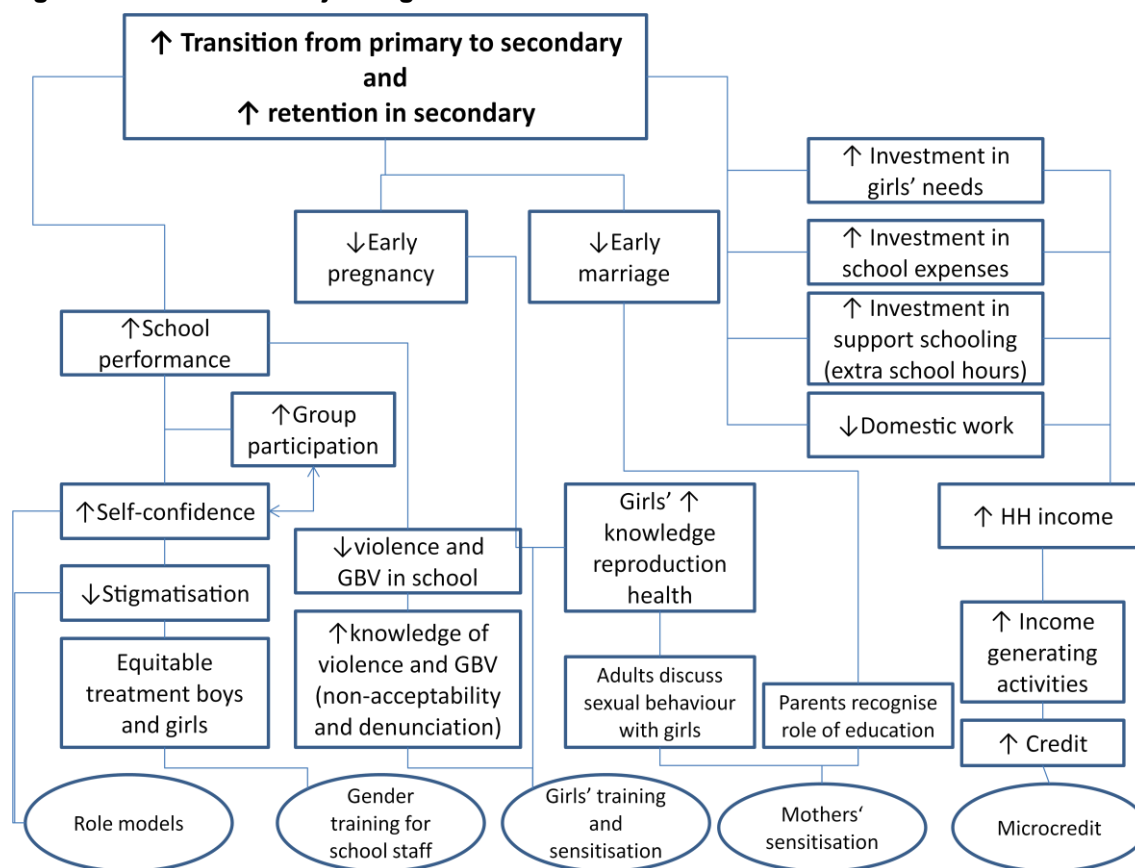
At its outset in October 2011, the project 'Girls Can – Promoting secondary education for girls in West Africa' included the following activities:

1. Setting up mothers' associations to conduct training and sensitisation activities, as well as micro-finance activities.
2. Setting up girls' clubs, to conduct sensitisation activities for girls on reproduction health and violence against women.
3. Setting up training and sensitisation activities for school staff.
4. Identifying role-model women to organise exchanges on topics that would encourage girls and their parents to attend school. These role models were women from the village who had completed at least the Diplôme d'Etudes Fondamentales (D.E.F.) and who were currently employed, that would act as inspirational models for girls currently attending schools.
5. Associations supporting girls' attendance at school.
6. Organising meetings with parents to discuss the importance of girls' education.

Within the mothers' associations the project conducted sensitisation activities and established microcredit activities.

Figure 2.1 provides a visual representation of the project logic.

Figure 2.1 Girls Can: Project logic



Based on the rationale in the logic model, access to credit was expected to improve access to income generating activities (IGA), and through this improve overall household income. Higher household income was also expected to increase parents' investment in supporting girls' time spent on school revision during after-school hours as well as support girls' completion of homework, expenses in school investments, and expenses in girls' needs. All these aspects were thought to be essential to facilitate girls' transition from the primary to the secondary school cycle.

Higher household income was expected to reduce the demand for girls' domestic work because more-wealthy households would be able to hire external support to help with domestic chores. However, it was also recognised that mothers' engagement in income-generating activities could have also increased pressure on the demand for girls to do domestic work.

Mothers' sensitisation activities were intended to improve awareness and parents' recognition of the role of education, with the aim of reducing early marriages. Mothers were also trained to discuss sexual behaviour with girls, with the aim of improving adolescents' knowledge of reproduction health and reducing early pregnancy.

Girls' training and sensitisation sessions were conducted with the aim of improving knowledge of gender-based violence (GBV), reducing girls' acceptance of violence and increasing their willingness to denounce such incidents. This was expected to reduce episodes of violence and gender-based violence in schools and, in so doing, lead to a better school environment and reduce the incidence of school drop-outs.

The project also conducted training sessions with school staff members (teachers and directors) with the aim of improving a positive school environment for girls to keep studying. These training sessions were expected to generate a more equitable treatment of boys and girls at school and, in conjunction with the use of role models, reduce girls' stigmatisation and improve their self-confidence.

3 EVALUATION DESIGN

This Effectiveness Review employs a quasi-experimental approach to carry out an impact evaluation of the project 'Girls Can'.

The central problem in evaluating the impact of any project is how to compare the outcomes that result from that project with *what would have been the case* without that project having been carried out. Clearly it is not possible to observe what project participants' situation would have been had they not had the opportunity to participate in the project. In any evaluation, that 'counterfactual' situation cannot be directly observed: it can only be estimated.

In the evaluation of programmes that involve a large number of units (whether individuals, households, or communities), common practice is to make a comparison between units that were subject to the programme (the intervention group) and those that were not (the comparison group). As long as the two groups can be assumed to be similar in all respects except for the implementation of the specific project, observing the situation of those where the project was not implemented can provide a good estimate of the counterfactual. It is good practice for programmes to collect baseline data on prospective project participants as well as non-project participants, in order to compare with greater confidence the outcomes once the project intervention ends.

In the context of this Effectiveness Review, girls in project schools (the intervention group) were compared to girls in non-project schools (the comparison group). As the data collection for this evaluation was conducted only towards the end of project life, it was not possible to establish with certainty whether the difference in the project's intended outcomes between intervention and comparison girls existed before the project started. For this reason, the econometric technique applied to this evaluation relies on a matching procedure that allows the retention in the intervention and comparison groups of only those units that are similar enough, based on certain aspects that characterised girls' profiles at baseline. As a consequence, observed differences between intervention and comparison group can be associated with project impact.

It should be noted that all matching procedures rely on the assumption that the 'observed' characteristics (those that were measured and controlled for in the data analysis) capture all of the relevant differences between the two groups. If there are 'unobserved' differences between the groups, then estimates of outcomes derived from them may be misleading. Unobserved differences between the groups could potentially include differences in attitudes towards education or motivation to send girls to school, and differences in perception of attitudes in the community. The choice of intervention and comparison schools to include in this Effectiveness Review was made to minimise the potential for any such unobservable differences to bias the results.

In the case of the project examined in this Effectiveness Review, the unit at which the programme was implemented was the school. Within the project area represented by one specific Centre d'Animation Pédagogique CAP, specific schools were selected for the project for the rollout of activities. The selection of schools was not random, but based on whether potential beneficiary schools met the following criteria: being a state school; having at least 200 students enrolled; being in the particular geographical area (i.e. in the CAP); and not being enrolled in any other project. However, given that within the same CAP there were more schools suitable for project objectives that met the criteria above, this allowed the adoption of the 'quasi-experimental' design described above. Girls in non-project schools were considered a reasonable valid counterfactual for the girls in project schools.

Girls in project schools were 'matched' with girls with similar characteristics in non-project (or 'comparison') schools. Matching was performed on the basis of a variety of baseline characteristics. Since some of these characteristics may have been affected by the project itself (particularly those relating to households' income-generating activities and wealth indicators),

matching was performed on the basis of reported indicators as recalled by respondents in relation to the time preceding the implementation of the project. In the absence of baseline data, survey respondents were asked to answer questions about their households' assets and income-generating activities in 2011, the year when the project was launched. Although recall data is unlikely to be as accurate as data measured at the time of the survey, the risk of introducing significant bias in the regression estimates is minimised as long as any inaccuracy in recall data affects equally respondents in the intervention and comparison groups. It must be stated that recall data are likely to be affected by measurement error due to likely inaccuracy of respondents' ability to recollect the information requested, especially at such an early age.

The survey data provided a large number of individual and household-level characteristics to perform the matching exercise. The first step in the matching procedure consisted in matching girls on the basis of these 'baseline-recalled' characteristics (see Section 4.2). Operationally, the matching was done first generating a 'propensity score' to capture the probability of a girl being in a project school conditional on a set of background information provided, and other observed and measured characteristics.

Girls in project and comparison schools were then matched based on their being associated with the same propensity scores. Following the implementation of the Propensity Score Matching procedure, another matching technique called Coarsened Exact Matching (CEM) was further applied to check the actual comparability across intervention and comparison group girls in the distribution of each characteristic on which the matching was done. The details of the PSM and CEM procedures are presented in Appendices 2 and 3.

4 DATA

4.1 SAMPLING OF INTERVENTION AND COMPARISON GROUPS

The focus of this study is to establish the impact of the project on girls' empowerment as well as the transition rate from primary to secondary school. In order to define the correct sample for this investigation, the evaluation exercise has taken into account both temporal and spatial dimensions.

The first task was to define the appropriate temporal dimension by identifying the cohort of students for the study. As noted in Section 2.1, the school system in Mali includes two cycles in the *Enseignement Fondamental* level; six years in the primary cycle, followed by three years in the secondary cycle. At the end of the *Enseignement Fondamental* girls obtain the Diplome d'Etudes Fondamentales (DEF), and transfer to the *Secondaire general and technique* level of schooling. The first three years in this secondary school system are called lycée, and can then be further completed with additional two to four years of schooling.

The project started in 2011 and supported 25 schools (17 primary cycle schools and 8 secondary cycle schools), with the objective to increase the retention rate of girls in the primary and secondary cycle (of the *Enseignement Fondamental*), and to support their transition from the primary to the secondary cycle (within the *Enseignement Fondamental*). For this reason, the sample frame constructed for this evaluation included a list of girls who in 2011 were enrolled in years 3 4, 5 and 6 of the *Enseignement Fondamental* level of schooling. By the time the project ended (and this evaluation exercise was carried out in January 2016) girls in this cohort of students were expected to either:

- I. have dropped out of school;
- II. be in years 7, 8, or 9 of the second cycle of the *Enseignement Fondamental*, or in the first year of lycée (in the *Secondaire general and technique* level of schooling, and therefore have completed the DEF; or
- III. still be enrolled in primary school, if they had to repeat a school year.

Figure 4.1: Sampling frame for selection of intervention and comparison group girls

	Enseignement Fondamental Girls completing this order receive the DEF (Diplome d'Etudes Fondamentales)							Enseignement Secondaire Girls completing this order achieve the Baccalaureate		
	Primary Cycle (6 years)				Secondary Cycle (3 years)			Lycée public and private (3 years)		
Grade	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th

The official registers of project schools were requested ahead of the survey, and from them a list compiled of all girls enrolled in school in 2011 in all the 17 primary schools covered by the project. In 2011 2,022 girls were enrolled in Years 3 to 6. Of these, the evaluation team randomly selected 328 to be included in the intervention group. As anticipated, not all girls who

were in school at the outset of the project were found to still be enrolled at the time of the evaluation, so particular effort was made to track down those who had dropped out.

The second stage of the evaluation exercise identified an appropriate number of comparison schools, as per the requirements of a quasi-experimental evaluation approach, using the criteria for project participation.

As already noted, the project supported 25 schools (17 primary schools and 8 secondary schools) in the Baguinéda CAP of the Kati circle, within the Koulikoro region in southern Mali. Schools targeted by the project had to meet all of the following criteria:

1. Be a state school in a rural area.
2. Have at least 200 enrolled pupils.
3. Be within the same CAP (Baguinéda).
4. Not have received interventions by other organisations in the past.

During the initial workshop of the evaluation exercise, 34 primary schools were identified that met these criteria (located in the Baguinéda CAP and had not received any intervention connected to the Oxfam project 'Girls Can'). In order to validate the selection of an appropriate set of comparison schools, this exercise was carried out with the support of representatives from the pedagogic centre in Baguinéda, with representatives from the Ministry of Education, and with all the directors of the 25 project school .

From the initial list of 34 primary schools, the evaluation team randomly selected 20 schools and gathered the lists of girls who in 2011 were enrolled in them between years 3 to 6 . This enabled the team to randomly select 600 girls to be interviewed for the comparison group. The schools selected for comparison purposes may have received interventions from other organisations active in the same period, and this was a likely possibility given the number of projects the area has been exposed to since 2000. The idea here was instead to capture schools (and girls therein), who had not been involved in the Oxfam project, and that could therefore be similar enough to the project beneficiaries, but not identical in terms of education-related interventions received. The latter condition, once satisfied in the sampling process, enabled an analytical test for the existence and size effect of the value added of the 'Girls Can' project relative to other interventions rolled out in the same area at the time of the project targeting an improvement in school outcomes.

The final sample included 324 girls randomly selected from 17 intervention primary schools and 591 girls randomly selected from 20 primary schools in the same CAP, but not involved in the project. The sampling principle applied was to randomly select girls from a complete list of girls registered as enrolled in their expected school year at baseline (i.e. in 2011), and then to track them at the time of the survey (January 2016) regardless of whether they were currently attending school (in their expected year of schooling, or in a lower one had they repeated one or more years since the project started), or had dropped out. The enumerators were instructed to replace the respondent only in instances where locating girls was not possible.

There were in total 153 girls who were not identified from the original sampling frame; 130 (85 percent) from non-project schools, and 23 (15 percent) from project schools. Table 4.1 shows the reasons recorded for not being able to locate these girls in each sample of schools.

Table 4.1 Why was it not possible to interview the person?

Reasons	Comparison	Intervention
<i>Attending Lycée</i>	17	0
<i>Moved</i>	42	5
<i>Moved to other school</i>	12	0
<i>School drop-outs</i>	23	2
<i>On vacation</i>	0	1
<i>Not recognised in community</i>	36	15
Total	130	23

Girls who had moved (without any further detail disclosed) and girls who were not known in the surveyed communities, were the most common reasons recorded to explain the problems faced in the field to identify individuals in the lists of girls originally sampled to conduct the survey. Eighteen percent of cases in the comparison group were classified as school drop-outs whom the survey teams were not able to locate, compared to 9 percent from project schools. It is important to stress that the survey team was not able to establish with certainty whether unidentified girls categorised under the headings ‘Moved’, ‘Not recognised’, and ‘On vacation’ had actually dropped out of school.

4.2 ANALYSIS OF BASELINE CHARACTERISTICS

Girls in project and comparison schools were compared in terms of their socio-economic characteristics in 2011. This information was either recalled during the survey or reconstructed from the household specific data, using details about the composition of girls’ households at the time the project was launched in 2011. The set of variables used to compare project school girls to school comparison girls is shown in Table 4.2, which compares girls in the two groups prior to matching the samples for comparison purposes. The differences reported are mostly not statistically significant, which suggests that the two samples being balanced. It must be noted, however, that if differences among girls in the two groups existed before the project started, these could potentially bias the comparability of project outcomes between the project and comparison schools. As described in Section 3, the main approach used in this Effectiveness Review – propensity-score matching (PSM) – allows the control and balancing out of these differences if they exist. Full details of the matching procedure used in this review are described in Appendix 2. Once matched, girls in the project and comparison schools were reasonably well balanced in terms of the recalled baseline data, with very few significant differences between them. The reasons for and consequence of these decisions are described in greater detail in Appendix 2.

Table 4.2: Recalled baseline characteristics before matching

Variable	Intervention			Comparison			Diff. Means
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	
<i>Household (HH) head in 2011 was male</i>	324	0.95	0.21	591	0.93	0.26	0.02
<i>Age HH head in 2011 less than 42</i>	324	0.27	0.44	591	0.27	0.44	0.00
<i>HH head in 2011 had no education</i>	324	0.51	0.50	591	0.47	0.50	0.04
<i>HH head in 2011 was married</i>	324	0.27	0.44	591	0.27	0.44	0.00
<i>HH head in 2011 was father</i>	324	0.82	0.38	591	0.76	0.43	0.06***
<i>Farming HH head main activity in 2001</i>	324	0.57	0.50	591	0.60	0.49	-0.03
<i>Wealth index – bottom quintile</i>	324	0.24	0.43	591	0.18	0.38	0.06
<i>Wealth index – second quintile</i>	324	0.22	0.41	591	0.19	0.39	0.02***
<i>Wealth index – third quintile</i>	324	0.21	0.41	591	0.20	0.40	0.01
<i>Wealth index – fourth quintile</i>	324	0.19	0.39	591	0.21	0.41	-0.02
<i>Wealth index – fifth quintile</i>	324	0.15	0.36	591	0.23	0.42	-0.08***
<i>Girls in 3rd grade at baseline</i>	324	0.39	0.49	591	0.36	0.48	0.03
<i>Girls in 4th grade at baseline</i>	324	0.36	0.48	591	0.30	0.46	0.06**
<i>Girls in 5th grade at baseline</i>	324	0.14	0.35	591	0.23	0.42	-0.08***
<i>Girls in 6th grade at baseline</i>	324	0.11	0.31	591	0.11	0.31	0.00

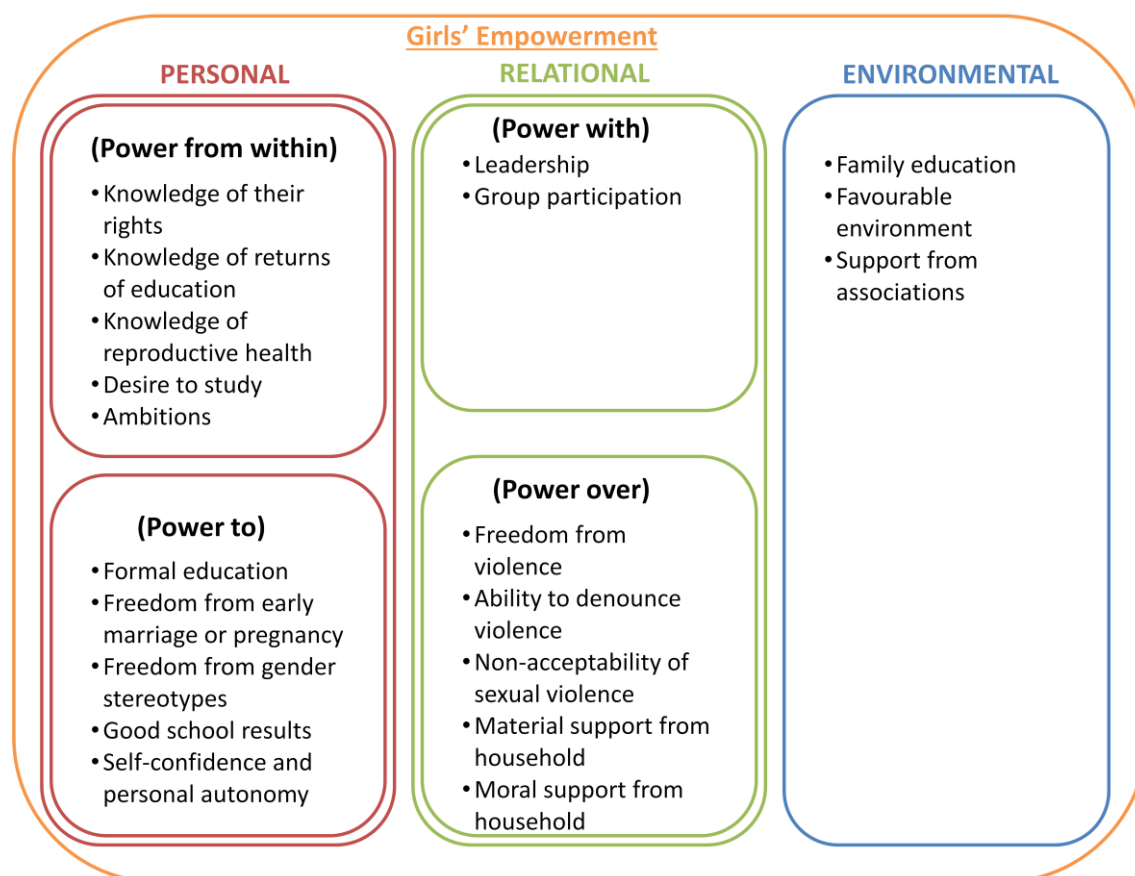
5 MEASURING GIRLS' EMPOWERMENT IN MALI

In addition to investigating the specific project outcomes, this evaluation also aimed to investigate the project's impact on increasing women's and girls' empowerment. In order to measure empowerment, Oxfam GB adopts and adapts a measurement approach based on assessing several dimensions of women's empowerment, and combining these into a single women's empowerment index.

This approach builds on the Women's Empowerment in Agriculture Index (WEAI) developed by the International Food Policy Research Institute (IFPRI) and by the Oxford Poverty and Human Development Initiative (OPHI) with support from the United States Agency for International Development (USAID). Oxfam combined this multidimensional approach to women's empowerment with a theoretical framework on empowerment found in the literature (VeneKlasen and Miller [2002], Rowlands [1997], and CARE [2009]).

The index used for this Effectiveness Review uses indicators associated with empowerment specifically designed to account for a population of adolescent girls rather than women. Although similar to the index used for other reviews under the theme of women's empowerment, it identifies three different levels where empowerment change can take place: the personal, the relational, and the environmental. These three levels are also mapped over four dimensions of change in power. Figure 5.1 illustrates the logic of the measurement approach followed in this evaluation work.

Figure 5.1: Key dimensions of girls' empowerment in Mali



There is no single generic set of 'empowerment' characteristics that is applicable to all contexts. While the framework remains constant, the specific characteristics and relevant indicators of

empowerment are defined differently in each evaluation to enable Oxfam to build a context specific composite index. The choice of indicators used to define and measure girls' empowerment for this project was constructed during a workshop where 17 representatives of mothers' associations involved in the project were invited to participate.

The 17 mothers attending the workshop were asked to list what characteristics describe an empowered girl in the project and country context. The list of characteristics, once identified, was subsequently turned into 20 indicators of empowerment, divided into the three levels of change as illustrated in the outer frames of Figure 5.1 above.

The mothers who participated in this exercise were also asked to rank in order of importance the three indicators that they thought best captured the most important dimensions of girls' empowerment in the social context of the communities covered by the project. To carry out this exercise, each mother was asked to assign three points to her first choice of empowerment indicator, two points to her second choice, and one point to her last (least important) choice. The points were then added up to generate a relative weight for each indicator, which was calculated based on the proportion of points it had received.

Table 5.1: Characteristics of girls' empowerment examined in this Effectiveness Review

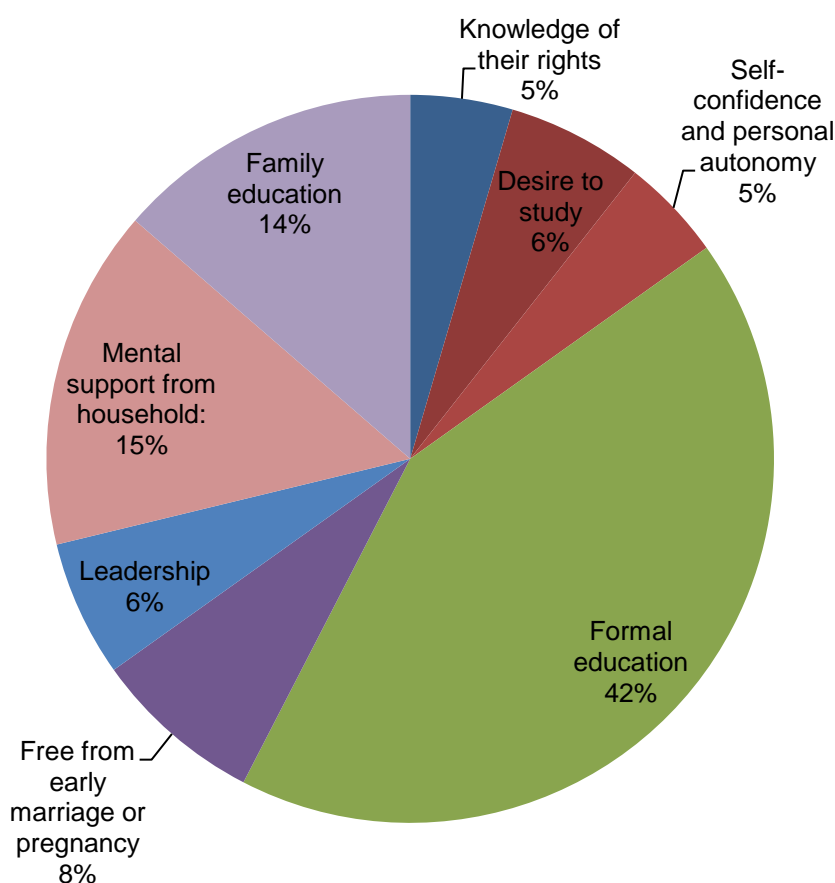
Level	Dimension	Characteristic	Weight (%)
Personal	Power from within	Knowledge of their rights	4.5
		Desire to study	6.1
		Ambitions	-
		Knowledge of the advantage of education	-
		Knowledge of reproduction health	-
	Power to	Formal education	42.4
		Freedom from early marriage or pregnancy	7.6
		Self-confidence and personal autonomy	4.5
		Obtain good school results	-
		Freedom from gender stereotypes	-
Relational	Power with	Leadership	6.1
		Group participation	-
	Power over	Freedom from violence	-
		Ability to denounce violence	-
		Not acceptability of sexual violence	-
		Material support from household	-
		Moral support from household	15.1
Environmental		Family education	13.6
		Favourable environment	-
		Support from associations	-

Table 5.1 provides the list of indicators chosen during the workshop with their relative weights; as mothers were given the option to choose and rank in order of importance only three

indicators, the weighted index counts a reduced number of indicators relative to the un-weighted one.

Figure 5.2 provides a graphical representation of this exercise, and suggests that formal education was ranked to be by far the most important indicator of girls' empowerment, receiving a 42 percent importance weight, followed by indicators of family moral support received by the girls (with a 15 percent weight), and by the level of education completed in the girls' household (which received a 14 percent weight). This is an important indication of what is the perception of girls' empowerment in the community. These top three indicators suggest that girls' ability to complete at least secondary school or be on track to do so, as well as aspects of girls' social environment, are considered more important for their empowerment than characteristics that may define girls' personal attitudes, knowledge of their own rights, or decision-making choices. We shall return to this point in the concluding remarks.

Figure 5.2: Weighted girls' empowerment characteristics



Based on discussion with project partners during the workshop, a questionnaire was designed to capture the characteristics listed in Table 5.1. The questionnaire was tailored to capture each empowerment indicator. For each characteristic a dummy variable was defined to measure the corresponding empowerment status of each respondent. The women's empowerment multidimensional index represents the proportion of the 21 empowerment indicators on which girls scored positively. A weighted index was also produced, using the relative weights reported in Table 5.1, to generate an alternative empowerment index for the reduced number of weighted indicators identified during the weighting exercise.

6 RESULTS

6.1 INTRODUCTION

This report is intended to be free from excessive technical jargon, with more detailed technical information being restricted to the appendices. However, there are some statistical concepts that cannot be avoided in discussing the results. In this report, results will usually be stated as the estimated difference in mean indicators between girls enrolled in 2011 in primary schools where the project was implemented (the 'intervention' group) matched with girls enrolled in 2011 in schools where the project was not implemented (the 'comparison' group).

The tables with the results from the matching procedure, report statistical significance in these differences using stars; three stars (***) indicate a p-value of less than 1 percent, two stars (**) indicate a p-value of less than 5 percent, and one star (*) indicates a p-value of less than 10 percent. The higher the p-value, the less likely are estimates to reflect the true difference between groups. Results with a p-value of more than 10 percent are not considered to be statistically significant.

The results shown below have all been corrected after accounting for the observable differences at baseline between the girls in the intervention group and girls in the comparison group with propensity score matching (PSM).

6.2 INVOLVEMENT IN PROJECT ACTIVITIES

Prior to looking at the project's effect on its intended outcomes, we examine all respondents' participation in project activities.

As explained in Section 2, the project implemented the following activities in order to incentivise girls' attendance to school:

1. Organising training and learning events for school staff.
2. Setting up girls' clubs in each project school to conduct sensitisation activities for girls on reproduction health and on violence against women.
3. Organising meetings with parents to discuss the importance of girls' education.
4. Setting up mothers' associations to conduct training and sensitisation activities, as well as micro-finance activities to generate income (IGA).
5. Arranging for role models to visit schools.

Figure 6.1: Girls reporting having received support in project-type activities since 2011

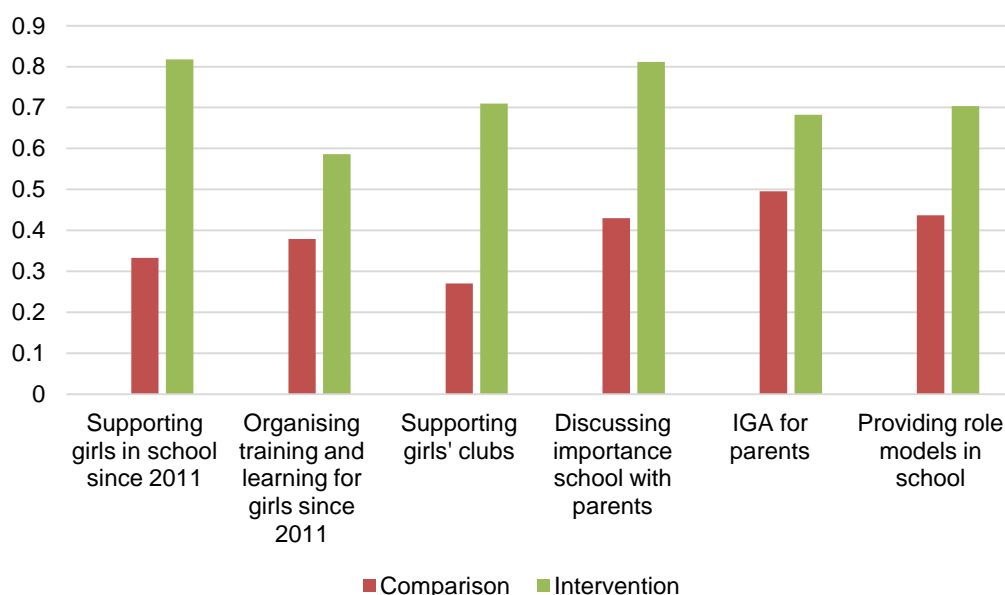


Figure 6.1 compares matched girls in the two groups of schools who reported receiving support in six different areas. It is important to note that, although one of the criteria for selecting schools for the comparison group was that potential schools should not have been exposed to similar project activities, this turned out to be an unrealistic condition to follow in the sampling process. As already noted in Section 4.1, the promotion of girls' education – also as part of the targets set out in the MDGs – has taken centre stage in many similar interventions initiated by various local and international NGOs, making it impossible to single out schools that had been completely untouched either directly or indirectly by activities similar to those featuring the 'Girls Can' project. For this reason, the interpretation of Figure 6.1 above needs to account for the incremental value that the Oxfam project has brought to girls in the project area compared to girls in the same CAP that will have been exposed to similar initiatives.

The figures clearly suggest that project girls, schools, and involved mothers, have had more substantial exposure to all project activities since 2011. It is particularly noteworthy that a significant difference in girls in the two groups being exposed to project-type activities is suggested in two areas: organisations supporting girls' school attendance, and organisations supporting girls' clubs.

6.3 WOMEN'S EMPOWERMENT

This section examines the differences between girls in the intervention and comparison school groups on the individual indicators and on the overall empowerment index as described in Section 5.

The outcome measures examined in this section are:

- Overall girls' empowerment
- Personal-level indicators of change
- Relational-level indicators of change
- Environmental-level indicators of change.

Table 6.1 gives a comparison of the women's empowerment index measure used in the Effectiveness Review applied to this project.

Table 6.1: Girls' empowerment

	1	2
	Girls' empowerment (un-weighted)	Girls' empowerment (weighted)
<i>Intervention group mean:</i>	0.70	0.84
<i>Comparison group mean:</i>	0.67	0.81
<i>Difference:</i>	0.03***	0.03**
	(0.01)	(0.01)
<i>Observations intervention:</i>	324	324
<i>Observations:</i>	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

The results suggest that girls involved in the project scored positively, on average, in 70 percent of the 21 empowerment indicators, compared to 67 percent of girls in the comparison group. This difference was found to be statistically significant, suggesting a 3 percentage point difference in girls' overall empowerment between those who participated in the 'Girls Can' project and those who did not.

The second column in Table 6.1 provides estimates for the weighted women's empowerment index, looking only at those indicators in the project that the 17 mothers who participated in the focus group exercise (described in Section 5) rated as being most relevant in the project context. These estimates also suggest that girls in the project schools scored positively in 84 percent of the (weighted) characteristics, compared to 81 percent in the comparison group. Again the 3 percentage point difference was found to be statistically significant.

Table 6.2 presents the indicators in four dimensions of power: power within, power to, power with, power over, and three levels level of change: personal, relational and environmental. It suggests that the project was successful in improving empowerment taking place at personal level, with project girls scoring a statistically significant 2 and 4 percentage points higher respectively in the 'power within' and in the 'power to' dimensions relative to comparison girls, and scoring 7 percentage points higher than the comparison girls in the environmental level indicators of empowerment.

Table 6.2: Dimensions of girls' empowerment

	Personal		Relational		Environmental
	Power within	Power to	Power with	Power over	
<i>Intervention group mean:</i>	0.83	0.70	0.56	0.67	0.65
<i>Comparison group mean:</i>	0.81	0.65	0.54	0.67	0.58
<i>Difference:</i>	0.02*	0.05***	0.02	0.00	0.07***
	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
<i>Observations intervention:</i>	324	324	324	324	324
<i>Observations:</i>	907	907	907	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

Interestingly, the empowerment dimensions where project girls scored higher than comparison group girls were also those dimensions ranked as the most important by the mothers' associations' representatives.

The rest of this section will present results on all 21 indicators of empowerment to offer a complete picture of the findings from this review.

6.3.1 Personal

The first level of change refers to changes taking place within the person. Power can express itself in this context either ‘from within’ or ‘to’.

Power from within

This dimension measures changes in knowledge, personal opinions, attitudes and beliefs, and intends to capture a change in which a girl sees and perceives herself and other girls and people in society.

In the context of this project, the following indicators were identified:

1. Knowledge of their rights.
2. Knowledge of advantages of education.
3. Knowledge of reproduction health.
4. Desire to study.
5. Ambition.

Table 6.3: Power from within

	1	2	3	4	5
	Knowledge of their rights	Knowledge of advantages of education	Knowledge of reproduction health	Desire to study	Ambition
<i>Intervention group mean:</i>	0.57	0.98	0.81	0.99	0.80
<i>Comparison group mean:</i>	0.55	0.95	0.75	0.99	0.81
<i>Difference:</i>	0.02	0.03*	0.06**	0.00	-0.01
	(0.03)	(0.01)	(0.03)	(0.01)	(0.03)
<i>Observations intervention:</i>	324	324	324	324	324
<i>Observations:</i>	907	907	907	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

Knowledge of their rights measures if a girl knows her rights and is able to value them. Respondents were asked to what extent they agreed or disagreed with the following statements:

- I believe I should be able to decide by myself when to get married.
- My parents will take into account my opinion when it comes to marriage.

Column 1 in Table 6.3 provides estimates of the proportion of girls in the two groups who reported having agreed (partly or strongly) with **both** statements above. No evidence of project impact was found in relation to this indicator.

Knowledge of advantages of education measures if a girl is aware of the advantages in achieving good school grades. Respondents were asked to what extent they agreed or disagreed with the following statement:

- Education will allow me to become a respected member of society.

Column 2 in Table 6.3 provides estimates of the proportion of respondents in the intervention and comparison groups that agreed or strongly agreed with the statement above. Nearly all the project girls interviewed (98 percent) agreed or strongly agreed, this being three percentage points higher than girls in comparison group schools. This difference was found to be statistically significant despite its relatively small size.

Knowledge of reproduction health measures if a girl is aware of the risk of early pregnancy and she knows how to avoid it. Respondents were asked if, in their opinion, having a baby during their school years would have a negative impact on their life. If a respondent responded affirmatively, she was asked to indicate what measures she would undertake in order to avoid this. The possible options were:

- i. do nothing
- ii. stay away from boys
- iii. do not have sex
- iv. use contraception measures
- v. don't know.

Column 3 in Table 6.3 provides estimates of the proportion of girls who believed that early pregnancy would have a negative impact, and who knew how to avoid it (responding with one of the following answers: stay away from boys, do not have sex, or use contraceptive measures). The analysis found that more than 81 percent of the girls in the intervention met this standard, compared with 75 percent in the comparison group. This difference of six percentage points is statistically significant.

Desire to study measures the desire a girl has to be enrolled at school. Respondents currently enrolled in school were asked if they considered themselves happy in school, while respondents currently not enrolled in school were asked whether they would re-enroll in school had they had the opportunity to do so. Column 4 in Table 6.3 provides estimates on the proportion of respondents in the intervention and comparison groups that expressed being happy about being at school or that would like to go back to school if they had the opportunity. Both groups of girls were found to have a high desire to study, and there was no significant difference across girls' groups in relation to this indicator.

Ambition measures the level of aspiration a girl has in relation to school achievement. Respondents were asked:

- If it was their choice, which school grade would they like to reach?

Column 5 in Table 6.3 provides estimates of the proportion of girls in the intervention and comparison groups that aspire to achieve any grade greater than the D.E.F.,⁵ but no statistically significant difference was found between the two groups in relation to this indicator.

Power to

This second dimension of power measures changes in individual agency, meaning girls' capability to take decisions and carry them out. While the previous dimension was concerned with internal processes of how a girl perceives herself, this dimension is concerned with exercising agency and taking action.

In the context under analysis, the following indicators have been identified:

1. Formal education
2. Personal autonomy (self-confidence)
3. Freedom from early marriage or pregnancy
4. Good school results
5. Freedom from gender stereotypes.

Table 6.4: Power to

	1	2	3	4	5
	Formal education	Personal autonomy	Freedom from early marriage or pregnancy	Good school results	Freedom from gender stereotypes
<i>Intervention group mean:</i>	0.99	0.70	0.82	0.47	0.57
<i>Comparison group mean:</i>	0.95	0.64	0.78	0.39	0.55
<i>Difference:</i>	0.04***	0.06	0.04	0.08**	0.02
	(0.01)	(0.04)	(0.03)	(0.04)	(0.04)
<i>Observations intervention:</i>	324	324	324	324	324
<i>Observations:</i>	907	907	907	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

According to the workshop conducted with representatives from mothers' associations, formal education represents the most important characteristic of girls' empowerment. Column 1 of Table 6.4 gives estimates of the proportion of girls in the intervention and comparison groups that are currently enrolled in school or have successfully completed at least secondary school. The figures reported against this indicator need to be interpreted with caution, as they do not account for the actual number of girls who were initially randomly selected from the list of project participants and from the list of sampled comparison school girls. Despite the very high percentage of girls in formal education in the pooled sample, it was found that project girls scored four percentage points higher than girls in the comparison group in relation to this indicator and this difference was statistically significant.

Personal autonomy measures the extent to which a girl has the capacity to take actions for herself. During the workshop with representatives from mothers' associations this indicator was originally labelled as "self-confidence". However, when asked to specify what they meant by self-confidence, participants presented examples referring to the ability to take decisions and carry them forward, such as participating in groups or activities.

To measure personal autonomy, respondents were asked to indicate who in the household normally takes the decision on whether the respondent can personally participate in community groups or activities in their village or community. Estimates in Column 2 of Table 6.4 provide the proportion of respondents that indicated being able (solely or in conjunction with others, such as parents or spouse) to decide whether to participate in groups or activities. There is no evidence of any difference between project and comparison girls in relation to this indicator.

Freedom from early marriage or pregnancy measures the extent to which girls regard themselves as free from these. Estimates in Column 3 of Table 6.4 show the proportion of girls in the intervention and comparison groups aged under 16 years and not married and who have

not had a baby, as well as girls over 16 years of age who have completed secondary education or are still enrolled in school.⁶ A large proportion of all girls in the sample were reported from the survey as being free from early marriage based on this indicator. Project girls were four percentage points more likely to be free in relation to this indicator than girls in the comparison group, however this difference was not found to be statistically significant.

School results measures whether girls enrolled in school are achieving good grades. Participants in the workshop considered that receiving formal education was not necessarily enough to describe girls' empowerment, and suggested school results as an additional empowerment characteristic. Respondents enrolled in school were asked to specify the grade results obtained in their last school year. Estimates in Table 6.4 report the proportion of girls that received a mark of at least 12 points (if measured on a 20-point scale, or 6 points if measured on a 10-point scale) if they were enrolled in school, zero if the grade was lower than that or if the respondent was not enrolled in school. In project schools, 47 percent of girls sampled achieved good results. In comparison schools, 39 percent of the girls received good marks, with the 8 percentage point difference between girls from the two groups of school statistically significant.

Another important characteristic of girls' empowerment was being 'free from gender stereotypes'. Respondents were asked to what extent they agreed or disagreed with the following statements:

- At school, girls should sit at the back of the class, while boys sit at the front.
- It is OK for girls of my age to clean boys' and girls' latrines while boys are playing.

In order to build the relevant indicator, girls who answered that both statements were unacceptable were scored as being free of stereotypes, and as subject to gender stereotypes otherwise. Column 5 of Table 6.4 provides estimates of the proportion of responses from each group, and suggests no statistically significant difference.

6.3.2 Relational

This second level of change measures changes taking place in power relations within the girls' surrounding networks. The dimensions 'power with' and 'power over' both require changes in power relations in the interactions with other actors.

Power with

This dimension reflects the recognition that empowerment is a *collective process*, which requires the support and interaction of peers and organisations. In the context of the project this evaluation identified the following indicators:

1. Group participation
2. Leadership

Group participation measures the extent to which a girl participates in groups – assuming that such participation brings benefits, such as the ability to interact with other people outside the family, and support in school achievements. Respondents were asked to indicate whether they regularly attended meetings from a pre-populated list which included afterschool clubs, girls' playgrounds, homework groups, sport groups, cultural groups or other.

Table 6.5: Power with

	1	2
	Group participation	Leadership
<i>Intervention group mean:</i>	0.71	0.41
<i>Comparison group mean:</i>	0.69	0.39
<i>Difference:</i>	0.02	0.02
	(0.03)	(0.04)
<i>Observations intervention:</i>	324	324
<i>Observations:</i>	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

Leadership measures the extent to which a girl has decision-making power in the groups she is involved in. The respondents were asked to what extent they were involved in making important decisions in the groups they regularly attended.

For both indicators above, girls were marked as participating in groups and as having decision-making power in such groups if they participated (for the 'group participation' indicator) or had decision-making power (for the 'leadership' indicator) in **at least one** of the groups listed above.

In neither of these indicators was the project found to have had a positive impact on beneficiary girls.

Power over

This dimension measures changes in the power of the strong over the weak. Also this dimension represents changes taking place in the power relationship between individuals. In the context of the project, this evaluation identified the following indicators:

1. Freedom from violence – both physiological and physical.
2. Ability to denounce violence.
3. Non-acceptability of sexual violence.
4. Material support from household.
5. Moral support from household.

Table 6.6: Power over (violence)

	1	2	3
	Freedom from violence	Ability to denounce violence	Non-acceptability of sexual violence
<i>Intervention group:</i>	0.36	0.84	0.98
<i>Comparison group:</i>	0.37	0.79	0.97
<i>Difference:</i>	-0.01	0.06**	0.02
	(0.03)	(0.03)	(0.01)
<i>Observations intervention:</i>	324	324	324
<i>Observations:</i>	907	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

Freedom from violence measures whether a girl is free from violence. Respondents were asked whether they knew that someone may have done any of the following things to a girl close to them:

- Said something to humiliate her in front of others.
- Threatened to hurt or harm her or someone she cares about.
- Insulted her or made her feel bad about herself.
- Pushed her, shaken her, slapped or punched her or thrown something at her.
- Physically forced her to have sexual intercourse with him when she did not want to.

Estimates in Table 6.6 present the proportion of girls that reported not knowing a girl close to them being exposed to violence in any one of these five incidents. In both groups, the proportion of girls aware of these incidents was found to be less than 40 percent (36 percent among project girls, and 37 percent among comparison girls), but project girls were not found to be significantly more exposed directly or indirectly to any form of violence relative to comparison group girls, therefore suggesting no association between the project and this indicator of empowerment.

Ability to denounce measures the extent to which the girl considers herself able to denounce violence. Respondents were asked what they would do in the case of their being exposed to episodes of violence. The options were:

- i. do nothing
- ii. talk to their mother
- iii. talk to their teachers
- iv. talk to a friend, other (specify)
- v. don't know.

Table 6.6 provides estimates of the respondents in the two groups that reported talking to anyone (so answering ii. to iv. above). The data show that 84 percent of project girls declared being willing to denounce violence, which was found to be significantly higher by 6 percentage points than the 79 percent of girls in the comparison group. This difference therefore suggests a positive association between the project and an increasing willingness to denounce violence.

Non-acceptability of VAW measures the extent to which a girl considers violence against women acceptable. Respondents were asked whether they believed it is acceptable for a boy to have sex with a girl of their age without:

- her consent
- contraceptives if she did not want to.

Girls were classified as not accepting violence against women if they considered both statements above unacceptable. Nearly all girls interviewed thought violence against women was unacceptable, but project girls were two percentage points more likely to find this form of violence more unacceptable than girls in the comparison group, although this difference was not found to be statistically significant.

The evaluation also identified a set of indicators to measure the moral and material support girls received from their parents.

Moral support from the household was measured by asking respondents to what extent they agreed or disagreed with the following statements:

- My parents often encourage me to go to school and perform well at school.
- My parents often explain the advantages of education.

Estimates in Column 1 of Table 6.7 show the proportion of girls that have received either type of support from their family to attend school. All project beneficiaries have received at least some time of support from their families, and scored three percentage points higher in this indicator compared to comparison group girls.

Material support was investigated by asking each respondent if her family provided her with any of the following items: books, school kit, appropriate clothes, underwear, feminine hygiene materials, make-up and toiletries, jewellery, food or money for food at school during the break. Because not all girls in the sample are enrolled in school, this indicator was split into: i. investment in school expenses, and ii. investment in girls' needs, with estimates shown in the Columns 2 and 3 of Table 6.7. No compelling evidence of project impact was found in either of these indicators of material support (though there was an indication of comparison group girls not in school receiving a 6 percent higher investment from their families in their personal needs, this was found to be statistically weakly significant). However, one possible reason for this apparent lack of project impact could be that the project provided school materials to girls as one of its many activities. It is therefore little surprise that families had not spent additional money on the provision of school equipment.

Table 6.7: Power over (expenses)

	1	2	3
	Moral support from household	Material support (investment in school expenses)	Material support (investment in girls' needs)
<i>Intervention group mean:</i>	1.00	0.52	0.35
<i>Comparison group mean:</i>	0.97	0.54	0.40
<i>Difference:</i>	0.03***	-0.02	-0.06*
	(0.01)	(0.03)	(0.03)
<i>Observations intervention:</i>	324	324	324
<i>Observations:</i>	907	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

6.3.3 Environmental

The final level of empowerment assessed characteristics of the broader environment that support/contribute to a girl's empowerment. The following indicators have been identified for this evaluation:

1. Family education.
2. Favourable environment.
3. Support from associations.

Table 6.8: Environment

	1	2	3
	Family education	Favorable environment	Support from associations
<i>Intervention group mean:</i>	0.47	0.57	0.90
<i>Comparison group mean:</i>	0.48	0.59	0.67
<i>Difference:</i>	-0.02	-0.01	0.23***
	(0.04)	(0.00)	(0.03)
<i>Observations intervention:</i>	324	324	324
<i>Observations:</i>	907	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

Family education measures the level of education of the family the girl lives with. Despite not being an indicator that can be influenced by the project, mothers felt that it should be included as it describes the characteristics of girls' empowerment. In order to generate a realistic measure for this indicator, we set completion of secondary school by any household member as the threshold for defining a family with 'high level of education'. No evidence of project impact was found under this indicator.

Favourable environment measures the extent to which girls are studying/living in an environment that is free from violence and favourable for their education. In this area, girls in the

comparison group were found to score 1 percentage point higher than project girls under this indicator, though the difference was found to be weakly statistically significant.

Support from associations measures the extent to which girls perceive that they live in an environment where there are associations that are supporting them. Respondents were asked to what extent they agreed or disagreed with the following statement:

- In my village/school there are groups and associations supporting girls like me to go and study.

In this 90 percent of project girls scored positively relative to 67 percent of girls in the comparison group, and the 23 percentage point difference was highly significant.

6.4 OTHER OUTCOME INDICATORS

As reported in Section 2, the project's main objectives were not directly linked to the girls' empowerment. This section investigates the impact of the project in achieving its overarching goal: higher rates of transition of girls from primary to secondary school. It also investigates project impact on activities aiming to improve household income, such as mothers' access to credit and income-generating activities. Finally, it shows the impact of the project on girls' time-use at school and doing domestic work.

6.4.1 Schooling

The first indicator in Table 6.9 shows the proportion of girls who were either currently enrolled in secondary school or had completed the secondary school cycle. Given the sampling procedure adopted, this measure captured girls who would have successfully transitioned to the appropriate school grade given the year of schooling they were in at the onset of the project (2011). The share of project girls under this indicator (55 percent) was found to differ significantly from that of comparison girls (47 percent), therefore suggesting that project beneficiaries were able to meet the overarching objective of the 'Girls Can' project; to retain girls in the primary and secondary cycle of the compulsory level of school, and to support the transition to secondary level schooling.

Table 6.9: School transition and equal treatment of boys and girls

	1	2
	School transition	Equitable treatment boys and girls
<i>Intervention group mean:</i>	0.55	0.85
<i>Comparison group mean:</i>	0.47	0.73
<i>Difference:</i>	0.07**	0.12***
	(0.08)	(0.03)
<i>Observations intervention:</i>	324	321
<i>Observations:</i>	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

Girls were also asked whether the seating arrangement of pupils in the classroom was such that boys sat at the front and girls at the back. This question was used to build a gender equality treatment indicator. In this area project girls were found to be significantly different from girls in the comparison group, with 85 percent of project girls stating that boys and girls in their school are not usually divided by gender in the class, against 73 percent of the comparison girls. The 12 percentage point difference is statistically significant.

6.4.2 Mothers' income-generating activities and household income

In order to measure the impact of the project on different indicators of household income, three variables connected to the project's intended outcomes were generated. Table 6.10 shows the share of girls stating that:

1. their mothers have been involved in a microfinance group at any time since 2011
2. their mothers had been involved in income-generating activities in the last 12 months

Column 3 in the table also reports a wealth index⁷ that captures the composition of household assets owned by the respondents at the time of the survey.

Table 6.10: Household income

	1	2	3
	Mothers received microcredit support	Mothers involved in income generating activities	Household wealth (Normalised)
<i>Intervention group mean:</i>	0.41	0.69	0.04
<i>Comparison group mean:</i>	0.40	0.71	0.06
<i>Difference:</i>	0.01	-0.02	-0.02
	(0.03)	(0.03)	(0.05)
<i>Observations intervention:</i>	324	324	324
<i>Observations:</i>	907	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching.

No impact was found across any of these indicators linked to household income effects.

6.4.3 Time use

Finally, the evaluation analysed girls' time-use across schooling and domestic chores, in order to establish whether the time allocated to these two different activities had been affected by the project.

This section investigates the following:

- Number of hours in a typical day reported being at school or spent studying after school if still enrolled in school (Column 1).
- Self-reported perception of change in time devoted to schooling activities since 2011 when the project started if still enrolled in school (Column 2).
- Number of hours in a typical day reported being responsible for the care of children, the elderly or other household members, and hours reported cooking, cleaning and washing clothes (Column 3).
- Self-reported perception of change in time devoted to unpaid care activities since 2011 when the project started (Column 4).
-

Table 6.11: Time use

	1	2	3	4
	Hours/day involved in schooling activities	1[Time involved in schooling is increasing]	Hours/day involved in domestic activities ⁺	1[Time involved in domestic activities is increasing]
<i>Intervention group mean:</i>	4.94	0.48	1.95	0.37
<i>Comparison group mean:</i>	4.88	0.44	2.45	0.34
<i>Difference:</i>	0.06***	0.04	-0.50***	0.03
	(0.03)	(0.04)	(0.15)	(0.03)
<i>Observations intervention:</i>	320	324	324	324
<i>Observations:</i>	872	907	907	907

Notes: Standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01; PSM estimates are bootstrapped with 1,000 repetitions. All means are calculated after matching ⁺ This time includes hours responsible for care of children and time devoted to cooking, cleaning the house, and washing clothes.

Column one in Table 6.11 suggests that girls still enrolled in school spend, on average, nearly five hours in school on a typical day, with project girls spending a statistically significant higher time in school than comparison girls (of 0.06 hours as reported in Column 1). No significant difference was found on self-reported increase in time spent in school and schooling activities since 2011 (Column 2). We found that project girls were spending, on average, almost two hours a day on domestic activities, and that their time doing these chores was found to be significantly lower than the average time spent by comparison group girls on the same activities (Column 3). The difference of 0.5 hours spent by comparison girls in domestic activities relative to girls in the intervention group was statistically significant. However this is not supported by self-perception measure of change (Column 4).

7 PROFILING UNIDENTIFIED GIRLS IN THE SAMPLE, AND GIRLS WHO DROPPED OUT OF SCHOOL

The nature of the 'Girls Can' project was such that the eventuality of girls dropping out of school at a certain stage in their scholastic life was something that needed to be accounted for. When girls who had dropped out of school were located, they were asked a number of questions about what stage they had left school and for what reason. In the sample of girls interviewed, only 35 girls were interviewed who had participated in the project and dropped out of school. The number of these girls in the data analysed was marginal (they represent only 3.8 percent of the total sample). Table 6.12 shows the relevant information on drop-out girls who were successfully identified, and suggests that nearly half of those surveyed had not completed primary school, and about a third dropped out sometime during their early years of secondary school.

Table 6.12: Scholastic year in which intervention girls dropped out of school

School grade at drop out	Frequency	Percentage
<i>Some primary (not completed)</i>	17	48.57
<i>Completed 1st primary</i>	4	11.43
<i>Some secondary (not completed)</i>	11	31.43
<i>Does not know</i>	3	8.57
Total	35	100

Table 6.13 below provides a further breakdown describing the reasons reported by girls who had dropped out of school against their current age.

Table 6.13: Reasons reported for dropping out against current age of girls.

Age of girls at time of survey	12	13	14	15	16	17	18	19	20	Total
Why are you not attending any school?										
<i>My parents refused to send me</i>	1			1	1					3
<i>My parents do not have enough money</i>			1		1					2
<i>I don't like studying</i>					1	1	1			3
<i>Studying was too difficult for me</i>					1	2	1			4
<i>Had too much work to do out of school</i>					1				1	2
<i>Got married</i>				1	2			2		5
<i>Got pregnant</i>						2				2
<i>Health problems</i>				1						1
<i>Repeated same class more than once</i>				2	1			1		4
<i>Other</i>		1		1	1	2	3		1	9

Interestingly, the majority of girls who dropped out of school in the sample were 15 to 17 years old at the time of the survey, and reported 'a resistance from the family' as the main reason for leaving their studies, or their inability to deliver well in school. Three girls reported early marriage as the reason for leaving school, and two girls who were 17 years old at the time of the survey said they had dropped out due to early pregnancy. Although these numbers are too small to make wider generalisation about the reality on the ground, they remain suggestive of girls' personal impediments in further pursuing their studies.

Finally, of the 35 surveyed girls who had dropped out of school, 27 (77 percent) stated they would re-enrol in schooling had they had the opportunity to do so, and among the eight who declared they wouldn't, two justified their answers on the grounds of being married, and six said they never liked school, and would therefore not return to education for this reason.

8 CONCLUSIONS

This evaluation has found evidence that the project 'Girls Can' had a positive and significant impact on girls' empowerment in project schools.

In order to measure girls' empowerment the evaluation identified and analysed 20 indicators to measure empowerment levels of girls from project and non-project schools in the Baguinéda CAP of the Koulikoro region. The main findings from this evaluation exercise suggest that project school beneficiaries on average score positively in 70 percent of the indicators, compared to girls from non-project schools who scored positively on average in 67 percent of the indicators. This 3 percentage point difference was found to be statistically significant, showing a positive impact of the project on overall girls' empowerment.

The Effectiveness Review revealed that girls from project schools were significantly more empowered than non-project schoolgirls in three dimensions: the 'power to', the 'power within', and the 'environmental'. There was also evidence of higher outcomes among project schoolgirls in three different areas that were identified to measure directly project effectiveness. Firstly, 55 percent of project girls successfully moved onto secondary school compared to 47 percent in the non-project group. Secondly, over three quarters of project girls made the transition to the grade they should be in, though there is no evidence that this share is directly associated with project activities. Thirdly, school results were significantly higher among project girls than among girls in the comparison group.

One important finding that emerged from the review was that although for some indicators a statistically significant difference was found between project beneficiaries and comparison group girls, for most empowerment indicators girls in both groups scored similar shares. This reflects that the intervention area (the Baguinéda CAP) has been heavily targeted by a variety of similar initiatives intending to promote girls' schooling under a national programme called SCOFI (Scolarisation et Formation des Filles).

However, the evaluation revealed a number of areas where this specific intervention has made a positive and marked contribution, particularly in the areas of knowledge of education of reproductive health, in school performance as measured by formal education level and in achieved results.

Very weak evidence of project and non-project girls' difference was found under the relational level of empowerment, which measures changes taking place in power relations within the girls' surrounding networks. Under the dimensions of 'power with' and 'power over', which fall under this level of power change, girls in project schools were only found to score higher than girls in non-project schools in being able to denounce violence.

Finally, at the environmental level of power change, girls from project schools scored higher than comparison girls in their reported perception of living in an environment where there are supportive associations. The creation of extra scholastic spaces, such as girls' clubs, or groups where girls could do homework or engage in social activities, featured as one of the signature activities of the 'Girls Can' project, therefore this result was in line with the intended outcomes of one of project's main activities.

APPENDIX 1

Table A.1: Definition and cut-off points of characteristics of girls' empowerment

Power from within	Knowledge of their rights	Measures if a girl knows her rights and is able to value them. The indicator was = 1 if respondents agreed with both of the following statements: <ul style="list-style-type: none"> • I believe I should be able to decide by myself when to get married. • My parents will take into account my opinion when it comes to marriage.
	Desire to study	Measures the desire a girl has to be enrolled at school. Respondents currently enrolled in school were asked if they considered themselves happy in school, while respondents currently not enrolled in school were asked whether if they had the opportunity they would like to be re-enrolled in school. The indicator was = 1 if different respondents answered yes to the above.
	Ambitions	Measures the level of aspiration a girl has in relation to school achievement. The indicator was = 1 if respondents stated that if it was up to them they would like to reach a secondary school grade or university education level.
	Knowledge of the advantage of education	Measures if a girl is aware of the advantages of achieving good school grades. The indicator was = 1 if respondents agreed with the following statement: <ul style="list-style-type: none"> • Education will allow me to become a respected member of society.
	Knowledge of reproduction health	Measures if a girl is aware of the risk of early pregnancy and she knows how to avoid it. Respondents were asked if having a baby during their school years would have a negative impact on their life. If she responded affirmatively, the respondent was asked to indicate what measures she would undertake in order to avoid this. The indicator was = 1 if respondents agreed with the first statement, and gave as possible answers to second question: i. stay away from boys, ii. do not have sex, iii. use contraception measures.
Power to	Formal education	Measures whether respondents obtained any formal education. The indicator was = 1 if the girl was currently enrolled in school or had completed the second cycle of primary school.
	Freedom from early marriage or pregnancy	Measures the extent to which girls regard themselves as free from early marriage and early pregnancy. The indicator was = 1 if the girl was less than 16 years old and not married, or enrolled in school; otherwise if older than 16 was = 1 if currently in school or completed some years in the secondary cycle of primary school.
	Self-confidence and personal autonomy	Measures the extent to which a girl has the capacity to take actions for herself. To measure personal autonomy respondents were asked to indicate who in the household normally takes the decision on whether the respondent can personally participate in community groups or activities in their village or community. The indicator was = 1 if the girls answered it was them, alone or together with someone else in the household, to take these decisions
	Obtain good school results	Measures whether girls enrolled in school are achieving good grades. The indicator was = 1 if the girls were enrolled in school and reported the last achievement grade obtained was the expected one, based on their schooling year.
	Don't take into account stereotypes	The indicator was = 1 if girls disagreed (fully or partly) to both the following statements: <ul style="list-style-type: none"> • At school, girls should sit at the back of the class, while boys sit at the front. • It is OK for girls of my age to clean boys' and girls' latrines while boys are playing.

Power with	Leadership	Measures the extent to which a girl has decision-making power in the groups she is involved in. The respondents were asked to what extent they were involved in making important decisions in the groups they regularly attended, and the indicator is a count variable that measures the number of groups respondents had decision making power in.
	Group participation	Measures the extent to which a girl participates in groups – assuming that such participation brings benefits, such as the ability to interact with other people outside the family, and supporting her in school achievements. Respondents were asked to indicate if they regularly attended meetings from a given list, such as afterschool clubs, girls' playgrounds, homework groups, sports groups, cultural groups or other. The indicator counts the number of groups respondents are members of.
Power over	Freedom from violence	Measures the extent to which a girl is free from violence. Respondents were asked whether they knew that someone may have done any of the following things to a girl close to them: <ul style="list-style-type: none"> • Said something to humiliate her in front of others. • Threatened to hurt or harm her or someone she cares about. • Insulted her or made her feel bad about herself. • Pushed her, shaken her, slapped or punched her or thrown something at her. • Physically forced her to have sexual intercourse with him when she did not want to. This indicator was = 1 if girl answered NOT knowing anyone that had been subject to ANY of the 5 incidents of GBV above.
	Ability to denounce violence	Measures the extent to which the girl considers herself able to denounce violence. Respondents were asked what they would do in the case of their being exposed to episodes of violence. The indicator is = 1 if girls said they would: i. talk to their mother, ii. talk to their teachers, or iii. talk to a friend.
	Non-acceptability of sexual violence	Measures the extent to which a girl considers violence against women acceptable. The indicator is = 1 if girls disagreed (strongly or partly) with both the following statements: <ul style="list-style-type: none"> • It is acceptable for a boy to have sex with a girl of their age without her consent. • It is acceptable for a boy to have sex with a girl of their age without contraceptives if she did not want to.
	Material support from household	Each respondent was asked if her family provides her with the following items: books, school kit, appropriate clothes, underwear, feminine hygiene materials, make-up and toiletries, jewellery, food or money for food at school during the break. Because not all girls in the sample are enrolled in school, this indicator has been split into investment in school expenses and investment in girls' needs. The corresponding indicators were set = 1 if girls received all the items listed in each category from their families.
	Moral support from household	The indicator is = 1 if girls agreed with at least one of the following statements: <ul style="list-style-type: none"> • My parents often encourage me to go to school and perform well at school. • My parents often explain the advantages of education.
Environmental	Family education	Measures the level of education of the family the girl lives with. Despite not being an indicator that can be influenced by the project, mothers felt that it should be included as it describes the characteristics of girls' empowerment. The indicator is = 1 if the highest level of education in the girls household was completion of secondary school.
	Favourable environment	Measures the extent to which girls are studying/living in an environment that is free from violence, and favourable for their education. The indicator is = 1 if girls had not experienced in school any episode of GBV.
	Support from associations	Measures the extent to which girls perceive that they live in an environment where there are associations that are supporting them. The indicator is = 1 if girls agreed with the following statement: <ul style="list-style-type: none"> • In my village/school there are groups and associations supporting girls like me to go and study.

APPENDIX 2: METHODOLOGY USED FOR PROPENSITY- SCORE MATCHING

The analysis of outcome variables presented in Section 6 of this report involved group mean comparisons using propensity-score matching (PSM). The basic principle of PSM is to match each participant with a non-participant that was observationally similar at baseline and to obtain the treatment effect by averaging the differences in outcomes across the two groups after project completion. Unsurprisingly, there are different approaches to matching, i.e. to determining whether or not a household is observationally ‘similar’ to another household. For an overview, we refer to Caliendo and Kopeinig (2008).⁸ This appendix describes and tests the specific matching procedure used to derive the results presented in Section 6 of this report. Appendix 3 describes an alternative matching procedure that was used to confirm the robustness of those results.

ESTIMATING PROPENSITY SCORES

Given that it is extremely hard to find two individuals with exactly the same characteristics, Rosenbaum and Rubin (1983) demonstrated that it is possible to match individuals using a prior probability for an individual to be in the intervention group, naming it *propensity score*. More specifically, propensity scores are obtained by pooling the units from both the intervention and comparison groups and using a statistical probability model (e.g. a probit regression) to estimate the probability of participating in the project, conditional on a set of observed characteristics.

Table A2.1 presents the probit regression results used to estimate the propensity scores in our context. To guarantee that none of the matching variables was affected by the intervention, we only considered variables related to baseline, and only those variables that were unlikely to have been influenced by anticipation of project participation (Caliendo and Kopeinig, 2008).

Table A2.1: Estimating the propensity score: Probit regression, reporting marginal effect

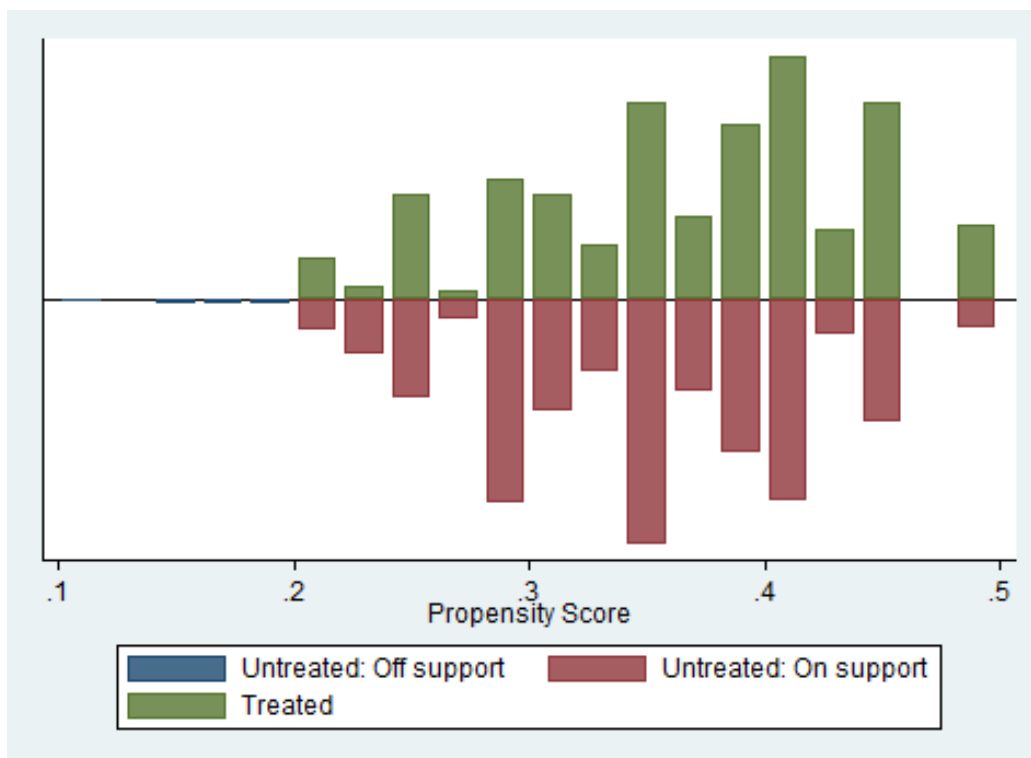
Dep variable: Dummy=1 if Project Girl	dF/dx	Std. Err.	Z
HH head in 2011 was male	0.074	0.084	0.85
Age HH head in 2011 less than 42	-0.062	0.140	-0.43
HH head in 2011 had no education	0.042	0.033	1.28
HH head in 2011 was married	0.069	0.154	0.46
HH head in 2011 was married and was girl's father	0.065	0.043	1.47
Farming HH head main economic activity in 2011	-0.039	0.033	-1.21
<i>Wealth index – first quintile</i>	0.162	0.054	3.06
<i>Wealth index – second quintile</i>	0.115	0.054	2.19
<i>Wealth index – third quintile</i>	0.097	0.053	1.86
<i>Wealth index – fourth quintile</i>	0.065	0.053	1.24
Number of obs	915		
Wald chi2(13)	18.55		
Prob > chi2	0.0464		
Pseudo R2	0.0164		
Log pseudolikelihood	-584.96		

DEFINING THE REGION OF COMMON SUPPORT

After estimating the propensity scores, the presence of a good *common support area* needs to be checked. The area of common support is the region where the propensity-score distributions of the treatment and comparison groups overlap. The common support assumption ensures that ‘treatment observations have a comparison observation “nearby” in the propensity score distribution’ (Heckman, LaLonde and Smith, 1999). Since some significant differences were found between the intervention and comparison groups in terms of their baseline characteristics (as detailed in Section 4.2), some of the girls in the intervention group were too different from the comparison group to allow for meaningful comparison. We used a minima and maxima comparison, deleting all observations whose propensity score is smaller than the minimum and larger than the maximum in the opposite group (Caliendo and Kopeinig, 2008). Seven observations were dropped from the comparison samples and three from the intervention samples as they were outside the area of common support. The consequence of dropping project participant observations is that the estimates of differences in outcome characteristics between the various treatment groups only apply to those intervention observations that were not dropped; that is, they do not represent the surveyed population as a whole.

Figure A2.1 illustrates the propensity scores and shows the proportion of observations lying on and off the areas of common support, by treatment group.

Figure A2.1: Propensity score on and off area of common support



MATCHING INTERVENTION AND COMPARISON PARTICIPANTS

Following Rosenbaum and Rubin (1983), after estimating the propensity scores and defining the area of common support, individuals are matched on the basis of their propensity score. The literature has developed a variety of matching procedures. For the main results presented in this Effectiveness Review we chose to employ the method of kernel matching. Kernel matching weights the contribution of each comparison group member, attaching greater weight to those comparison observations that provide a better match with the treatment observations. One common approach is to use the normal distribution with mean zero as a kernel, and weights given by the distribution of the differences in propensity score. Thus 'good' matches are given greater weight than 'poor' matches.

The *psmatch2* module in Stata was used with a bandwidth of 0.04 and with the analysis restricted to the area of common support.

When using PSM, standard errors of the estimates were bootstrapped using 1,000 repetitions (clustered by school), to account for the additional variation caused by the estimation of the propensity scores and the determination of the common support.⁹

CHECK BALANCING

For PSM to be valid, the intervention group and the matched comparison group need to be balanced, in that they need to be similar in terms of their observed baseline characteristics. This should be checked.

Table A2.2: Balancing test

Variables	Unmatched/Matched	Mean Treated	Mean Control	T-test	p> t
<i>HH head in 2011 was male</i>	U	0.95	0.93	1.48	0.14
	M	0.95	0.95	0	1.00
<i>Age HH head in 2011 less than 42</i>	U	0.27	0.27	-0.07	0.94
	M	0.27	0.27	-0.12	0.90
<i>HH head in 2011 had no education</i>	U	0.51	0.47	1.27	0.20
	M	0.51	0.51	-0.08	0.94
<i>HH head in 2011 was married</i>	U	0.27	0.27	-0.07	0.94
	M	0.27	0.27	-0.12	0.90
<i>HH head in 2011 was married and male</i>	U	0.26	0.25	0.3	0.76
	M	0.26	0.26	-0.13	0.90
<i>HH head in 2011 was father</i>	U	0.82	0.76	2.09	0.04
	M	0.82	0.81	0.34	0.74
<i>Farming HH head main activity in 2001</i>	U	0.57	0.60	-0.91	0.36
	M	0.57	0.56	0.18	0.86
<i>Wealth index – bottom quintile</i>	U	0.24	0.18	2.11	0.04
	M	0.24	0.25	-0.28	0.78
<i>Wealth index – second quintile</i>	U	0.22	0.19	0.9	0.37
	M	0.22	0.21	0.21	0.84
<i>Wealth index – third quintile</i>	U	0.21	0.20	0.38	0.70
	M	0.21	0.20	0.06	0.95
<i>Wealth index – fourth quintile</i>	U	0.19	0.21	-0.66	0.51
	M	0.19	0.18	0.39	0.70

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%concern	%bad
Unmatched	0.02	19.48	0.04	6.5	6.2	30.6*	1.01	9	0
Matched	0.00	0.52	1.0	1.4	1.0	5.6	0.92	0	0

* if 'of concern', i.e. variance ratio in [0.5, 0.8) or (1.25, 2] ** if 'bad', i.e. variance ratio <0.5 or >2* if B>25%, R outside [0.5; 2]

The most straightforward method to do this is to test whether there are any significant differences in baseline covariates between the intervention and comparison group in the matched sample, as reported in Table A2.2. None of the variables implemented for the matching are statistically significant in the matched sample.

APPENDIX 3: APPLYING COARSENEDED EXACT MATCHING TO TEST PSM

In order to address the validity of the results presented in Section 6, this Effectiveness Review also implemented an alternative matching procedure known as Coarsened Exact Matching (CEM), a method for improving the estimation of causal effects by reducing imbalance in covariates between treated and comparison groups. CEM is a fast, easy to use and understand procedure, which possesses a number of attractive statistical properties that can be summarised as follows:

1. It strictly bounds both the degree of model dependence and the average treatment effect estimation error.
2. It eliminates the need for a separate procedure to restrict data to common empirical support.
3. It meets the congruence principle.
4. It is robust to measurement error and works well with multiple imputation methods for missing data.
5. It is extremely fast computationally.

Exact matching simply matches a treated unit to all of the comparison units with the same covariate values.

The key challenge with CEM is that while exact matching provides perfect balance, it typically produces few matches due to the curse of dimensionality. For instance, adding one continuous variable to a dataset effectively makes exact matching impossible, since two observations are unlikely to have identical values on a continuous measure. To address this issue, the CEM procedure temporarily coarsens each variable into substantively meaningful groups, searches for exact matches on these coarsened data and then only retains the original (un-coarsened) values of the matched data.

As coarsening is a process at the heart of measurement, many analysts decide subjectively how to coarsen a variable into groups that preserve information. The algorithm works as follows:

1. Begin with the covariates X .
2. Coarsen X according to user-defined cut-points.
3. Create one stratum per unique observation of X and place each observation in a stratum.
4. Assign these strata to the original data, X , and drop any observation whose stratum does not contain at least one treated and one comparison unit.

Once completed, these strata are the foundations for calculating the treatment effect. The inherent trade-off of matching is reflected in CEM too: larger bins (more coarsening) will result in fewer strata. Fewer strata will result in more diverse observations within the same strata and, thus, higher imbalance.

It is important to note that CEM prunes both treated and comparison units. This process changes the quantity of interest under study to the treatment effect in the post-matching sub-sample.

In order to compare the difference between indicators of project activities in the two groups so as to compare PSM with CEM, the coarsening of the data for exact matching was carried out using the same covariates used to run the first stage of PSM to retrieve the PSM score.

Table A3.1: Matching Summary

Number of strata: 109
 Number of matched strata: 67

	0	1
All	591	324
Matched	516	316
Unmatched	75	8

Table A3.1 shows the summary of the procedure: 83 observations were dropped as a result of the exact matching process carried out – 75 from the comparison group, and 8 from the treatment/intervention group. Table A3.2 reports for each project indicator (directly or indirectly connected with the logic of the intervention) the differences observed across the two groups using PSM (as per Section 6) and when applying CEM. All the results presented in the report are confirmed, therefore suggesting that the findings reported in Section 6 are robust.

Table A3.2: Consistency between PSM and CEM Procedures

(1) Level	(2) Dimension	(3) Characteristic	(4) PSM Diff.	(5) CEM Diff.	
			<i>N. Obs</i> 907	<i>N. Obs</i> 641	
Empowerment index	(all 21 indicators)		0.03***	0.14***	
Empowerment index	(8 weighted indicators)		0.03***	0.03***	
Personal	Power from within	Knowledge of their rights	0.02	0.09**	
		Desire to study	0.00	-0.01	
		Ambitions	-0.01	-0.04	
		Know advantage of education	0.03*	0.02	
		Knowledge of reproduction health	0.06**	0.10***	
	Power to	Formal education	0.04***	0.05***	
		Freedom early marriage/pregnancy	0.08**	0.07***	
		Self-confidence/personal autonomy	0.06	0.04	
		Obtain good school results	0.08**	0.09***	
		Freedom from gender stereotypes	0.02	0.09***	
Relational	Power with	Leadership	0.02	0.004	
		Group participation	0.02	-0.01	
	Power over	Freedom from violence	-0.01	0.03	
		Ability to denounce violence	0.06**	0.06**	
		Non-acceptability of sexual violence	0.02	0.03***	
		Moral support from household	0.03***	0.02***	
		Material support from household (school equipment)	-0.02	0.01	
		Material support from household (girls' needs)	-0.06*	-0.07**	
		Environmental	Family education	-0.02	-0.01
			Favourable environment	-0.01	0.03
Support from associations	0.23***		0.26***		
Indicators related to project logic		Household Wealth (Normalised)	-0.02	-0.04	
		Equitable treatment boys and girls	0.12***	0.10***	
		Transition rates to secondary school	0.04	0.01	

NOTES

- 1 The drop-out rate in the original list of randomly selected girls was 4 percent of girls (35 girls) in the surveyed sample. However, this figure substantially underestimates the drop-out rate in the underlying population, as is suggested by the higher rate of drop-out girls that the survey conducted for this review was not able to identify.
- 2 The Centres d'Animation Pédagogique (CAP) are sub-regional education services created to improve the performance of teachers by focusing on educational leadership, continuous training, monitoring, and school's principals and teachers supervision.
- 3 http://www.unicef.org/infobycountry/mali_statistics.html; consulted April 27, 2016.
- 4 Net enrolment ratios are defined as the number of children enrolled in primary or secondary school who belong to the age group that officially corresponds to primary or secondary schooling, divided by the total population of the same age group.
- 5 In Year 9, the students sit a nationwide exam called the *Diplôme d'Etudes Fondamentales* (D.E.F.), which, if passed, can then lead either to high school or to vocational and technical training.
- 6 The sample composition included 24 percent of girls aged under 16, with a slightly younger profile in the intervention group, where 20 percent of girls were under 16 years old, as opposed to 27 percent of girls in the comparison group.
- 7 Measuring household income directly is problematic: self-reported measures of total income are generally regarded as unreliable, given the wide variety of endeavours such populations engage in to generate income. Most households were engaged in other livelihood activities; a direct income measure would have to collect detailed information about the contribution of each of these activities to household income. An alternative way to consider income is to investigate asset ownership. Respondents were asked about their household ownership of various goods and assets, as well as about their housing condition. Using a method called Cronbach's alpha, a total of 23 assets were used to construct a wealth index. This index was created applying principal component analysis (PCA), a data reduction technique that narrows the variation in asset ownership, which is assumed to represent wealth status: the more an asset type is correlated with this variation, the more weight it is given to it. The wealth indicator presented in Table 6.10 is shown in its normalised specifications.
- 8 Caliendo, M. and Kopeinig, S. 2008. Some Practical Guidance for the Implementation of Propensity Score Matching, *Journal of Economic Surveys*, Wiley Blackwell, vol. 22(1), pages 31–72.
- 9 Bootstrapping is a statistical procedure where repeated samples are drawn from the original sample with replacement. This results in a statistical distribution of parameter estimates (the sampling distribution). The bootstrapped standard error is the standard deviation of this sampling distribution and it can be shown that as the number of repeated samples becomes large, provided certain technical conditions are met, this is a good estimate for the standard error of the estimate.

REFERENCES

Blackwell, M., Iacus, S., King, G. and Porro, G. 2009. CEM: Coarsened Exact Matching in Stata. *The Stata Journal*, 9 (4), pp 524–546.

Institut Africain de Gestion et de Formation (INAGEF), 2012. *Etude de la Situation de Reference de 25 Ecoles du CAP de Baguinéda*. Baseline report for the 'Girls Can (Les Filles Pevent) project

VeneKlasen, L. and Miller, V. 2002, *A New Weave of Power, People and Politics: The Action Guide for Advocacy and Citizen Participation*, Practical Action Publishing

Roland, J. 1997. *Questioning Empowerment: working with women in Honduras*, Oxfam

CARE. 2009. *Women's Empowerment SII Framework*. CARE. Available at CARE's Women's Empowerment Strategic Impact Inquiry Library. Available at: <http://pqdl.care.org/sii>.

Oxfam Effectiveness Reviews

For more information, or to comment on this report, email opalenquiries@oxfam.org.uk

© Oxfam GB April 2017

This publication is copyright but the text may be used free of charge for the purposes of advocacy, campaigning, education, and research, provided that the source is acknowledged in full. The copyright holder requests that all such use be registered with them for impact assessment purposes. For copying in any other circumstances, or for re-use in other publications, or for translation or adaptation, permission must be secured and a fee may be charged. E-mail policyandpractice@oxfam.org.uk.

The information in this publication is correct at the time of going to press.

Oxfam GB, Oxfam House, John Smith Drive, Cowley, Oxford, OX4 2JY, UK.

OXFAM

Oxfam is an international confederation of 20 organizations networked together in more than 90 countries, as part of a global movement for change, to build a future free from the injustice of poverty. Please write to any of the agencies for further information, or visit www.oxfam.org.

Oxfam America (www.oxfamamerica.org)
Oxfam Australia (www.oxfam.org.au)
Oxfam-in-Belgium (www.oxfamsol.be)
Oxfam Brasil (www.oxfam.org.br)
Oxfam Canada (www.oxfam.ca)
Oxfam France (www.oxfamfrance.org)
Oxfam Germany (www.oxfam.de)
Oxfam GB (www.oxfam.org.uk)
Oxfam Hong Kong (www.oxfam.org.hk)
Oxfam IBIS (Denmark) (<http://oxfamibis.dk/>)
Oxfam India (www.oxfamindia.org)
Oxfam Intermón (Spain) (www.intermonoxfam.org)
Oxfam Ireland (www.oxfamireland.org)
Oxfam Italy (www.oxfamitalia.org)
Oxfam Japan (www.oxfam.jp)
Oxfam Mexico (www.oxfammexico.org)
Oxfam New Zealand (www.oxfam.org.nz)
Oxfam Novib (Netherlands) (www.oxfamnovib.nl)
Oxfam Québec (www.oxfam.qc.ca)
Oxfam South Africa (<http://www.oxfam.org.za/>)

