Non-formal learning programs in Nigeria and their potential to close reading gaps for out-of-school children

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Abstract

In this study, we examine the association between attending a Non-Formal Learning Center (NLFC) in Sokoto and Bauchi states for at least nine months and reading outcomes for out-of-school children (OOSC) who are mainstreamed into formal schooling by grade 4 (P4). We use Hierarchical Linear Modeling with data from 1,116 pupil Early Grade Reading Assessments (EGRA) and pupil surveys collected by the NEI Plus program. Overall, NFLC-mainstreamed pupils read at the same low levels as their peers who have received formal schooling, despite having had disruptions to their education. Given this evidence, policymakers should consider maintaining the NFLCs to jumpstart OOSC into school.

Introduction

In 2014, 34.2 million children were out of school in sub-Saharan Africa (UNESCO Institute for Statistics [UIS] & Global Education Monitoring Report [GEMR], 2016). This represents more than half of the world's total out-of-school children (OOSC) of primary school age. More than a quarter of the OOSC in the region reside in Nigeria (UIS & GEMR, 2016). Many of these children are out of school because of distance to schools, home conditions, conflict, poverty, and cultural practices such as girl-child marriage (Adewale, 2009; Glassman et al., 2008).

Numerous studies around the world demonstrate how non-formal education (NFE) has been used as a stepping stone to formal schooling (Abreh & Wilmot, 2018; Adewale, 2009; Bilagher & Kaushik, 2020; Carter et al., 2020a; Hartwell, 2016; Hopper, 2008; Shohel & Howes, 2018). In sub-Saharan Africa, NFE has been used as a path to allow OOSC to access education and reenter formal school. NFLC works as "catchup education," "accelerated learning programs," or "open schools" compared to Formal Learning Centers or Formal Schooling. Examples of these programs include the Accelerated Language Program (NALAP) in Ghana, the Accelerated Learning Programme (ALP) in Iraq, and the Accelerated Education for

out-of-school children in the Democratic Republic of the Congo.

Yet, the evidence demonstrating how well non-formal learners in the region perform once they begin formal schooling is limited and mixed (Akyeampong et al., 2018; Carter et al., 2020a, 2020b; Randall et al., 2020). Given these uncertainties, policymakers continue to face costly decisions about the best way to support NFE and transitions to formal schooling.

To the best of our knowledge, no peer-reviewed study has been published on the links between NFLCs and primary school reading outcomes in northern Nigeria using large-scale empirical evidence. We address this knowledge gap by examining the association between exposure to NFLCs for at least nine months and **pupils' oral reading fluency (ORF) scores and** syllable identification (SI) in Hausa, and English ORF at P4 mid-**year. We used 1,116 pupils' Early** Grade Reading Assessments (EGRA) and pupil surveys collected by the Northern Education Initiative Plus (The Initiative) program in Bauchi and Sokoto states in a Hierarchical Linear Model (HLM). We controlled for individual, family, and school characteristics to address the non-equivalent groups nature of the study.

Background and Context

In several countries, NFE has been used as a strategy to expand access to education, promote retention, and improve learning outcomes. In India, evidence from the Child Labour Project Schools (CLPS) shows a promising relationship between NFE and pupil enrollment and retention in formal schools. CLPS were created as part of a national effort to eliminate child labor by providing a monetary and food incentive for children to transition from work to non-formal schooling (Sud, 2010).

Employing a family fixed effects model, Sud (2010) compared enrollment and retention rates of 389 pupils from seven CLPS and their same-age siblings who did not participate in the program. Results showed that at least 77% of CLPS participants enrolled into formal schooling compared to 23% of their siblings in the control group. Moreover, CLPS participants were 40–50% more likely to remain in school relative to their siblings (Sud, 2010).

Evidence from the well-documented Bangladesh Rural Advancement Committee (BRAC) program shows the potential of NFE to exponentially improve primary school enrollment and catch up OOSC with formal schooling learning outcomes. Between 1985 and 2004, BRAC student representation grew from **less than 0.1% to over 9% of Bangladesh's** total primary school enrollments (Chaboux & Schuh-Moore, 2006). The implementation of this and other educational support programs between 1988 and 2008 was linked to an overall reduction in OOSC from 23.4% to 13.6% (Nath & Chowdhury, 2009). Moreover, pupils from the BRAC program performed at the same level (Nath et al., 1999) or better (Chaboux & Schuh-Moore, 2006) in reading and numeracy as pupils in formal primary schools.

Evidence from Africa linking NFEs to improved learning outcomes is limited and mixed. In Ethiopia, Akyeampong et al. (2018) evaluated the Ethiopia Speed Schools (ESS), a program where OOSC ages 8 to 14 received 10 months of accelerated learning instructions before reintegrating to government schools. The researchers used propensity score matching to estimate differential effects of ESS on learning outcomes. The sample included 625 ESS pupils, 625 pupils in formal schools with ESS mainstreamed pupils (Link Schools), and 625 pupils in formal schools with no mainstreamed pupils (Government Schools). Over time, ESS

pupils answered more questions correctly in Math, Sidama reading comprehension, and English reading comprehension than pupils in government schools, all statistically significant differences at the 1% level. Yet, many ESS pupils dropped out and did not perform at the expected grade level (Akyeampong et al., 2018).

In the Democratic Republic of the Congo, Randall et al. (2020) examined the relationship between an NFE program for out-of-school girls and learning outcomes. They followed the trajectories of a random sample of 625 pupils enrolled in *The Valorisation de la Scholarisation de la Fille* (VAS-Y Fille!) program for almost three years. They found that 80% of girls advanced through the VAS-Y levels as expected, and overall improved their Early Grade Mathematics Assessment (EGMA) and EGRA scores to a level of growth like that of pupils enrolled in formal schools. However, given the high percentage of dropouts, it is likely that attrition biased the results of the study (Randall et al., 2020).

In Ghana, Carter et al. (2020a, 2020b) **studied the country's Complementary Basic** Education Program (CBE) and its impact on academic performance when students were mainstreamed into formal schooling. Carter et al. (2020a) first did a longitudinal study of a random sample of 519 CBE pupils to examine whether the numeracy and literacy levels (combining scores from the EGRA and EGMA subtasks by Principal Component Analysis) persisted when mainstreamed into formal school. They found that pupils who were low performing at CBE continued to be low literacy and numeracy performers once mainstreamed, particularly girls (Carter et al., 2020a). In the second longitudinal study, they examined the literacy outcomes (using an adaptation of the EGRA) of a prospective cohort of 1,166 pupils who were taught in mother tongue in the CBE

program and then were mainstreamed into formal schooling. They found that pupils enrolled in formal schools where the language of instruction differed from their mother tongue showed poor literacy skills (Carter et al. 2020b). Yet a year later, pupils taught in another local language caught up while those taught in English did not (Carter et al., 2020b).

In view of the limited research available to inform policy decisions in Nigeria about how to best support NFE and the transitions to formal schooling, in the current investigation we focus on how well grade 4 pupils who participated in a non-formal catch-up program in Northern Nigeria performed once they began formal schooling. Their performance is compared to pupils who were continuously enrolled in formal schooling. The section that follows provides background and context of the NFE initiatives in Nigeria and the existing evidence linking NFE with early grade reading outcomes.

NFE in Nigeria

In northern Nigeria, significant percentages of school-age children are not enrolled in school. For instance, in Bauchi, 27.2 percent of primary school age children are not enrolled, and in Sokoto, 29% are not enrolled (FMOE, 2016). These gaps persist despite the **country's policy to provide compulsory, free and** universal access to basic education and significant investments by the federal government (Federal Republic of Nigeria [FRN], 2013). Across the north, millions of Nigerians have been internally displaced due to violent conflict driven by Boko Haram and other extremist groups, with consequences for their physical and mental health, education, and overall well-being (Amusan & Saka, 2017; Iacoelle & Tirivayi, 2020; Kaiser et. al, 2020; Odo et. al, 2020). Displaced children likely

experience disruptions to their educations, as do non-displaced children whose schools are destroyed or for whom school attendance is unsafe.

Lack of access to quality, consistent education translates into a lack of foundational literacy, numeracy, and social skills necessary to escape the circle of poverty, marginalization, and violence (Adetunji, 2020). In Nigeria, there are several constraints that impede children from attending school, ranging from socio-cultural and economic demand-side barriers to political, governance, capacity, and financing supply-side barriers (UNICEF & UIS, 2012). Many of these constraints set OOSC at a disadvantage compared to children who were able to enroll in formal schooling and predispose them to academic deficiencies or perpetuate their status as OOSC (UNICEF & UIS, 2012).

There is a growing realization that in the **effort to meet the United Nation's SDG 4: "Ensure inclusive and equitable quality education for all," it is to loo**k at other forms of learning outside of formal education. The government of Nigeria (GON) recognizes NFE as a strategic intervention to complement formal schooling and increase access for OOSC (FRN, 2013; Sokoto Ministry of Education, 2010; FRN, 2013). Acc**ording to Nigeria's Policy** on Education document, the provision of basic education for OOSC should enable them to function effectively in society (FRN, 2013). An important segment of NFE in Nigeria is provided by non-integrated religious schools that do not teach any formal academic subjects (World Bank, 2015).

Non-formal accelerated learning in Nigeria has shown some promise in improving reading outcomes. The results of an EGRA conducted in Jigawa, Kaduna, Kano, and Katsina states in 2014 revealed that non-formal learners

in all states outperformed formal learners in Hausa ORF (RTI International, 2014). Pupils **from Jigawa's Integrated Qur'anic and Tsangaya** Education (IQTE) non-formal schools, on average, were able to read 25 correct words per minute (cwpm), far outperforming their peers in P3 formal schools, who read just 3 correct words per minute on average (RTI International, 2014). In Kaduna, the differences in ORF scores between non-formal and formal learners was 14 cwpm vs. 2 cwpm, in Kano it was 17 cwpm vs. 6 cwpm, and in Katsina it was a 30 cwpm vs. 5 cwpm. In Katsina, 32% of boys from IQTE non-formal schools were able to read with comprehension (scoring 80% or greater on a set of comprehension questions related to a story) compared with just 4% of their peers in P3 in the formal schools (RTI International, 2014). Yet, **Qur'anic schools are only one specific modality** of NFE offered in Nigeria. Therefore, it is critical to determine whether other non-formal learning modalities in Nigeria allow OOSC to catch-up on basic education, and whether the academic skills they gained are maintained once pupils are mainstreamed into the formal education system.

To offer all children equal opportunity to be educated in the formal school system, the Nigerian government has adopted the practice of mainstreaming non-formal learners into formal schooling, generally during the fourth grade of primary school (P4). In principle, mainstreaming has the potential to equalize educational opportunities, improve non-formal **learners' self**-esteem and socialization skills, and create an atmosphere of understanding and tolerance among all learners (Oluremi, 2012). In practice, mainstreaming calls for more than just bringing in new students. To be effective, it requires flexibility in the school curriculum and learning environment, and in the cases of children with special needs, specific adaptations to physical infrastructure, learning styles, pace

of learning, and teaching strategies. (Oluremi, 2012). Some of the challenges to successfully transitioning non-formal learners into formal schooling include insufficient training on integrated formal and non-formal pedagogical approaches for all teachers and staff, lack of counseling services, negative attitudes of teachers and formally-schooled students toward non-formal learners, and lack of adequate spaces and facilities (Oluremi, 2012). Thus, to ensure inclusive and high-quality education for all children in Nigeria, it is essential to better understand how NFE and mainstreaming practices relate to student achievement in basic education.

The Northern Education Initiative Plus (The Initiative)

The Initiative (2015-2021) was a USAID-funded project in Bauchi and Sokoto States that built upon the prior Northern Education Initiative (in Bauchi state only) to increase access to quality basic education for more than 2 million children —1.4 million children in first to third grades and more than 400,000 OOSC and youth—and improve their reading skills. This Initiative was implemented by Creative Associates International (Creative) in collaboration with three U.S.-based organizations—Education Development Center (EDC), Florida State University (FSU), and Overseas Strategic Consulting (OSC), and four local organizations—Value Minds, Civil Society Action Coalition on Education for All (CSACEFA), the Reading Association of Nigeria **(RAN) and the Federation of Muslim Women's** Associations in Nigeria (FOMWAN).

To achieve its goals, The Initiative aimed to strengthen the technical and administrative capacity, commitment, and accountability of all levels of government and partner with local agencies, NGOs and civil society organizations to

promote the culture and importance of reading. The Initiative aimed to review and revamp reading instruction curricula and materials by approaching the issue from several different perspectives. First, pre-service teacher education programs were reformed, and teacher educators received training on evidence-based teaching practices. Second, teachers and learning facilitators in formal schools and NFLCs were trained on how to teach reading in Hausa in the first to third grades of primary school, as well as how to support pupils as they transition from Hausa to English. Third, NFLCs, Adolescent Girls Learning Centers (AGLC) and Youth Learning Centers (YLC) were established through local partnerships to provide thousands of OOSC with nine months of basic literacy and numeracy instruction before being mainstreamed into formal schooling. The Initiative has enrolled almost 90,000 OOSC into 1,900 NFLC, with special focus on girls, youth, and vulnerable children (Creative, 2018c).

To understand NFLCs' impact on reading outcomes, The Initiative conducted an EGRA pre- and posttest evaluation for its second cohort using random stratified sampling (Creative, 2018a). Results show 69% of OOSC entered the program without being able to read any words correctly in a grade-level Hausa passage; yet by the end of the program, the percentage of NFLC pupils unable to read any correct word fell to 48% (Creative, 2018c). Results showed that boys statistically significantly outperformed girls, by six percentage points (Creative, 2018c).

To assess the effectiveness of The **Initiative's formal school package of** interventions on improving reading outcomes, The Initiative conducted an evaluation using EGRA pre- and posttests for Grades 2 and 3 pupils in Sokoto and Bauchi. Results showed considerable reading gains for all pupils from

pretest to posttest (Creative, 2018b). The evaluation also shows significant reductions in zero scores for most of the EGRA Hausa subtasks for P2 pupils (Creative, 2018b). However, post intervention, well over half of the sampled P2 pupils were still unable to read or respond to a single comprehension question correctly (Creative, 2018b).

To effectively reach struggling readers, a series of multi-level interventions are needed. **Understanding pupils' previous exposure to** literacy and determining their level of preparedness before interventions take place will be key, particularly for NFLC pupils transitioning into formal schooling. In the present study, we address this concern by investigating how well some pupils who participated in the nine-month non-formal learning program performed once they began formal schooling, compared to students who were continuously enrolled in formal schooling.

Methods

Research Design

In this study, we assessed pupils in the middle of grade 4. A total of 559 of these pupils attended at least nine months of NFE at an NFLC prior to attending grade 4 (mainstreamed) and 557 attended only formal schools prior to attending grade 4 (non-mainstreamed). Given that the selection process to attend either school type was not random, we use a non-equivalent control group (NECG) design. In this design, pupils exposed to two different treatments were assessed at the end of the treatments and were compared on the same outcomes: treatment 1 **(pupils in NFLCs who received The Initiative's** nine-month program and were mainstreamed into formal schools at P4) and treatment 2 (pupils attending formal schools that received

The Initiative's teacher training for grades P1- P3, but not P4).

The main limitation on drawing causal inference with this design is the problem of selection bias: pupils in different groups are likely to be different from each other, and a direct comparison would erroneously lead to the attribution of differences in outcomes to the type of educational exposure, when they may actually be due to observable and unobservable factors associated with selection into the different education modalities (formal vs. non-formal) (Shadish et al., 2002). To minimize and control for selection bias, we first identified critical covariates that matter for selection into treatment and can be reliably measured. Then, we employ HLM using school clusters to compare outcomes.

Sample

The sample of mainstreamed and non-mainstreamed (formally schooled) pupils attending P4 in the public school system in Bauchi and Sokoto was selected using the following criteria: (1) Focus on the two states where The Initiative is operational, with 3,000 NFLCs participating; (2) Purposively sample schools with at least 20 mainstreamed learners from NFLCs in P4 (from Cohort 2 of the nine-month NFLC program implemented by The Initiative); and (3) At each school, data collectors randomly sampled 10 girls and 10 boys mainstreamed into P4, as well as 10 girls and 10 boys not mainstreamed into P4 from a school enrollment list. All sampled schools were intervention schools for The Initiative, meaning that curricular materials and training had been provided to teachers in grades 1 to 3, but not to the current teacher in P4.

As shown in Table 1, in total, 29 schools were sampled: 15 in Bauchi state and 14 in Sokoto state. The sample includes 1,116 pupils (559 mainstreamed and 557 non-mainstreamed). Table 2 displays the descriptive statistics for the analytic sample, disaggregated by placement status (mainstreamed vs. non-mainstreamed).

Table 1

Data Collection Summary

	Schools	Head Teachers	Teachers	P4 Pupils		
				All	Mainstreamed	Non-Mainstreamed
Sample	29	29	28	1,116	559	557
Bauchi	15	15	14	567	278	289
Sokoto	14	14	14	549	281	268

As shown in Table 2, the mainstreamed and non-mainstreamed groups were roughly equivalent in terms of sex, speaking Hausa as their mother tongue, socioeconomic status, and attitudes toward school. There were no statistically significant differences between the two groups, using t or x2 tests, as appropriate. In terms of school characteristics, on average, head teachers and teachers reported that 32% of schools had a library, schools had 24.5 students per teacher, teachers in P4 had taught for about

Table 2

Pupil Characteristics by Placement Status

	All		Mainstreamed		Non-mainstreamed	
Sample size	*1,116*		*559*		*557*	
	Mean	SD	Mean	SD	Mean	SD
Individual characteristics						
Hausa MT	0.90	0.30	0.89	0.31	0.91	0.29
Male	0.51	0.50	0.52	0.50	0.50	0.50
SES	5.48	2.66	5.33	2.68	5.63	2.64
Attitude score	17.43	4.37	17.42	4.22	17.44	4.53
School characteristics						
Library	0.32	0.47	-	-	-	-
Teacher-student ratio	24.50	16.37	-	-	-	-
Years teaching (teachers)	9.85	6.40	-	-	-	-
Teachers with NCE certificate	0.79	0.40	-	-	-	-
Teachers' literacy knowledge	4.42	1.15	-	-	-	-

10 years and 80% of teachers had earned the Nigeria Certificate of Education (NCE). The average teacher literacy knowledge score was 4.42 points out of 7 possible points.

Measures

Placement Status

Participation in NFLC is the treatment indicator and the independent variable of interest. We construct a placement status indicator so that NFLC participation before P4 takes on the value of one, and continuous formal schooling participation before P4 takes on the value of zero.

Reading Outcomes

Mainstreamed and non-mainstreamed pupils were directly assessed at the middle of their P4 year to measure their literacy skills. These assessment data were collected using the Early Grade Reading Assessment (EGRA), a collection of individual subtasks that measure some of the foundational skills needed for reading acquisition (this assessment protocol follows the guidelines outlined by Dubeck & Gove, 2015). For this analysis, we have included the following subtasks of the assessment:

Oral reading fluency (ORF). Measures the ability to read a grade-level passage of 100 words. It is scored for accuracy and rate. The measure used is the number of correct words read per minute (cwpm). Assessors discontinued the task if none of the 10 words in the first line were read correctly. This subtask was administered in English with scores ranging from zero to 15,

and in Hausa with scores ranging from zero to 27.

Syllable identification (SI). Measures the ability to read individual syllables. Fifty syllables are presented. It is timed to 60 seconds and is discontinued if none of the first five syllables is read correctly. This subtask was administered in Hausa with scores ranging from zero to 10.

Covariates

We carefully chose observable characteristics that matter for selection into school type, correlate with the outcome, and can be reliably measured. These include child, family, and school characteristics; specifically: gender, socio economic status (SES) (operationalized as an index of owning these 13 assets: a radio, phone, electricity, television, refrigerator, bicycle, motorcycle, car, canoe, boat, cart, generator, or computer), mother tongue, and attitude toward school-related activities (operationalized as a sum of Likert **scale responses to ten questions such as 'How do you feel when you read books?' 'How do you feel when you attend school?' 'How you feel when you do homework?' etc.). This resulted in a** possible score range of 0-50. The range of scores in the sample were 4 to 50. School covariates included the presence of a library, student-teacher ratio, years of teaching experience for teachers, the percentage of teachers holding a Nigeria Certificate of Education, and teacher literacy instruction knowledge (operationalized as an index of teacher responses to a brief literacy instruction knowledge assessment undertaken during data collection; see Annex 1 for sample questions).

Procedures

All sampled pupils were administered the EGRA assessment and pupil survey in February 2019 using tablets and CommCare software. All adults and pupils provided verbal consent to participation. The EGRA was administered by trained enumerators who had previously administered the EGRA with The Initiative in both English and Hausa. Enumerators participated in a one-day refresher training prior to data collection.

Analytic Plan

While reading comprehension has been used in other studies as the outcome measure of choice to determine reading ability, in this study we selected ORF and SI scores as the outcomes of interest. Given the high percentage of pupils scoring zero in reading comprehension in the sample, more basic components of reading, such as ORF or SI, provide better information about **pupils' reading skills** in this context, with greater variation in scores across students.

The model we use to identify the association between NFLC participation before P4 (mainstreamed pupils) and ORF or SI at P4 mid-year takes the form:

$$Y_i = \beta_0 + \delta T_i + \beta_1 G_{ji} + \beta_2 C_{ji} + \mu_i$$

For student i in school j, where Y_i is the ORF/SI scores at midyear P4 of pupil i. Hence, **the outcome ORF/SI is a function of δ the** treatment effect, T_i the treatment indicator/pupil i participated in NFLC for at least 9 months before P4 (0 comparison group, 1 treatment group), G_{ij} the state in which school j is situated and where pupil i attended, C_{ij} the covariates available that could help determine selection into treatment, and μ_i is the remaining error that is present. For this model we used Hierarchical Linear Modeling, clustering pupils by school, and conducted separate analyses for the English ORF, Hausa ORF, and Hausa SI outcomes.

Results

We began our analyses by examining the mean differences between mainstreamed and non-mainstreamed students on the literacy

Table 3

Pupil EGRA Reading Component Scores by Placement Type

Sample size	All 1,116		Mainstreamed 559			Non-mainstreamed 557			t test df=1,114
	Mean	SD	Mean	SD	Zero Scores	Mean	SD	Zero Scores	
English ORF	5.97	3.38	6.03	3.36	20%	5.92	3.41	22%	-0.50
Hausa ORF	5.55	3.64	5.69	3.66	24%	5.42	3.61	25%	-1.23
Hausa SI	6.13	4.64	6.11	4.67	26%	6.16	4.61	25%	0.15

*p<0.05; **p<0.01; ***p<0.001

Note: Zero scores represent a percentage of the pupils unable to answer a single item on a given subtest

outcomes. Table 3 shows the EGRA reading component scores by placement type (mainstreamed vs. non mainstreamed). As shown in Table 3, on average, pupils in the sample were able to read 5.97 cwpm (SD=3.38) in English, and 20% of pupils were not able to read at all. In Hausa, on average, pupils in the sample were able to read 5.55 cwpm (SD=3.64) from a 100-word grade level passage, and 24% of pupils were not able to read at all. In addition, on average, pupils were able to correctly identify 6.13 syllables per minute in Hausa, and 26% of pupils were not able to identify any syllables at all. The mean ORF for all P4 pupils in the sample able to correctly read any word (excluding students with zero scores) was 7.59 cwpm in English and 7.35 cwpm in Hausa. The best Hausa readers in our P4 sample were able to read 27 cwpm. We conducted two-sample t-tests and found no statistically significant differences in mean scores for any of the three reading component skills between mainstreamed and non-mainstreamed pupils.

To address our research question more precisely regarding the association between NFLC attendance and reading outcomes, we next used **HLM to predict pupils' ORF and SI** scores. Table 4 shows the ORF and SI score differences in English and Hausa (unstandardized coefficients) at P4 mid-year between mainstreamed and non-mainstreamed pupils. As stated earlier, given the non-random nature of the sample, omitted variable bias is a threat to our analysis. Our strategy for reducing this bias is to include all available child and family characteristics that were collected during the assessment that we believe

Table 4

Association between exposure to non-formal schooling (mainstreamed) for at least nine months and pupils' literacy scores at P4 mid-year

	English ORF		Hausa ORF		Hausa SI	
	(1)	(2)	(3)	(4)	(5)	(6)
R-squared	*0.08*	0.08	*0.08*	0.08	*0.13*	0.13
Prob>F	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
State						
Bauchi	-0.101	-0.098	-0.217	-0.207	0.829	0.831
	(0.39)	(0.39)	(0.43)	(0.43)	(0.54)	(0.54)
Individual Characteristics						
Hausa MT	-	-	-0.89	-0.864	-1.178	-1.175
	-	-	(0.54)	(0.54)	(0.73)	(0.73)
Male	-1.192**	-1.194**	-1.331***	-1.335***	-1.733***	-1.734***
	(0.38)	(0.38)	(0.35)	(0.35)	(0.39)	(0.39)
SES	-0.117*	-0.115*	-0.127*	-0.124	-0.214**	-0.214**
	(0.05)	(0.04)	(0.06)	(0.06)	(0.07)	(0.07)
Attitude	0.111**	0.111**	0.063*	0.063*	0.116**	0.116**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
School Characteristics						
Library	-0.294	-0.293	-0.586	-0.585	0.015	0.015
	(0.41)	(0.41)	(0.59)	(0.60)	(0.56)	(0.56)
Teacher-student ratio	0.012	0.012	0.002	0.002	0.026	0.027
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Years teaching (teachers)	0.021	0.021	0.001	0.001	0.008	0.008
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Teachers with NCE certificate	0.207	0.205	0.555	0.551	0.612	0.611
	(0.31)	(0.31)	(0.40)	(0.40)	(0.49)	(0.49)
Teachers lit. knowledge index	0.107	0.105	0.248	0.245	0.096	0.096
	(0.16)	(0.16)	(0.21)	(0.21)	(0.20)	(0.20)
Placement Status						
Mainstreamed		0.123		0.285		0.042
		(0.28)		(0.33)		(0.37)
Constant	4.246***	4.180***	5.297***	5.116***	5.190***	5.164***
	(0.77)	(0.79)	(1.18)	(1.21)	(1.35)	(1.36)

*p<0.05; **p<0.01; ***p<0.001

Note: Standard errors (SE) are in parenthesis. SE are adjusted by school clusters. Coefficients are non-standard. *p<.05. **p<.01. *** p<.001.

are correlated with the ORF/SI outcome. To do so, we used several regression models that build upon one another. This hierarchical modeling process also enables us to identify if adding variables of interest better explains and predicts the association between placement status and ORF/SI scores. A higher percentage of explained variance (R2) indicates a stronger association (Rosenthal & Rosenthal, 2011).

In Table 4, Models 1, 3, and 5 display coefficients and standard errors from regressions predicting the associations between **pupils' literacy** scores and their individual characteristics, school characteristics, and geographical locations. Models 2, 4, and 6 build on the previous models and include the treatment indicator/placement status. As displayed in Model 2, placement status (mainstreamed or non-mainstreamed) is not a statistically significant predictor of English ORF at P4 midyear. That is, the difference in ORF scores between mainstreamed and non-mainstreamed pupils is not statistically significant when accounting for other factors that could be correlated with English ORF scores. The full model explains 8% of the variance in English ORF scores (R2=0.08, p<0.001); when comparing Models 1 and 2, R2 does not statistically significantly increase with the inclusion of the placement variable.

Sex, SES, and attitude towards school are important predictors of English ORF. On average, girls were able to correctly read 1.19 words per minute in English more than boys. This difference was statistically significant (p<0.01). Attitude towards school was positively and significantly associated with English ORF (b=0.11, p<0.01); while SES was negatively and significantly associated with English ORF (b=-0.11, p<0.05). We note, however, that one word or less than one-word differences in scores,

while statistically significant, are not necessarily practically meaningful.

As displayed in Table 4, Model 4, placement status (mainstreamed or non-mainstreamed) is not a statistically significant predictor of Hausa ORF at P4 midyear. That is, the difference in ORF scores between mainstreamed and non-mainstreamed pupils is not statistically significant when accounting for other factors that could be correlated with Hausa ORF scores. The full model explains 8% of the variance in Hausa ORF scores (R2=0.08, p<0.001). No statistically significant increase in R2 occurs when placement status is added to the model (comparing Model 3 to Model 4).

Sex and attitude towards school are important predictors of Hausa ORF. On average, in Hausa, girls were able to correctly read 1.33 words per minute more than boys. This difference was statistically significant (b= -1.33, p<0.001). Attitude towards school was positively and statistically significantly associated with Hausa ORF (b=0.06, p<0.05). Again, however, these small differences between scores are not necessarily practically meaningful.

As displayed in Model 6, placement status (mainstreamed or non-mainstreamed) is not a statistically significant predictor of Hausa SI at P4 midyear. Model 6 explains 13% of the variance in Hausa SI scores (R2=0.13, p<0.001). Moreover, adding placement status (the independent variable of interest) into the full model does not uniquely explain any additional variance in Hausa SI scores (comparing Model 5 to Model 6).

Sex, SES, and attitude towards school are statistically significant predictors of Hausa SI, as with the other reading outcomes, though the sizes of these associations were small. On average, girls were able to correctly read 1.73

syllables per minute in Hausa more than boys. This difference was statistically significant (b= -1.73, p<0.001). **Pupils' attitude towards school** was positively and significantly associated with Hausa SI (b=0.11, p<0.01); while SES was negatively and significantly associated with Hausa SI (b=-0.21, p<0.01).

In sum, there are no statistically significant associations between exposure to **NFLCs for at least nine months and pupils'** literacy scores (ORF and SI) in Hausa and English at P4 mid-year. However, we note that on average, sampled pupils exhibited extremely low component reading skills generally.

Discussion

The aim of this study was to examine pupil reading performance during primary four (P4) in formal public schools in Sokoto and Bauchi and to determine whether or not pupils mainstreamed from NFLCs read at the same level as non-mainstreamed (formally schooled) pupils. The primary finding of this study is that pupils who have been mainstreamed from **NFLCs and received The Initiative's nine**-month intervention exhibit the same overall reading skill level as pupils who received their education in formal schools. Our results show no statistically significant association between exposure to NFLC for at least nine months and **pupils' ORF scores in Hausa and English or SI** scores in Hausa at P4 mid-year.

While some studies have found that pupils from NFE read better than their peers in formal schools (Akyeampong et al., 2018; Chaboux & Schuh-Moore, 2006), our findings empirically demonstrate that pupils in this sample, regardless of their previous placement status, exhibit similar levels of reading component skills. Our findings are aligned with several studies showing participation in NFE has

a neutral effect or non-significant effect in reading outcomes (Nath et al. 1999, Randall et al. 2020). However, the specific conditions of our study make it difficult to compare findings appropriately and accurately with interventions conducted under different settings and using different sample sizes and outcome measures.

The fact that we found no statistically significant differences in reading component skills between mainstreamed and non-mainstreamed pupils in this context is promising. As previously shown, OOSC start at a disadvantage. Compared to children who are able to continuously enroll in formal schooling, OOSC confront structural demand and supply-side barriers that put them at risk of delayed academic learning or no learning at all (UNICEF & UIS, 2012). They have experienced disruptions in their education, often due to traumatic events related to violent conflict.

Our study shows that exposure to NFE not only positions pupils at the same reading level as their formally-schooled peers, but also has the potential to close the reading gap for OOSC in northern Nigeria. Out of the pupils who are mainstreamed into formal schooling, our data shows that only 24% are unable to read any correct word in Hausa. Compared to the percentage of non-readers in an earlier study of OOSC entering NFLC programs (Creative, 2018c), that is an overall reduction of 45%.

However, our results also show that all pupils in P4 exhibit poor reading and literacy skills for their grade level. Even the best readers among both non-mainstreamed and mainstreamed pupils were only able to read 27 cwpm while the best P3 readers in other Nigerian states were able to read 50 cwpm (RTI International, 2014). This finding is consistent with previous early grade literacy studies in Bauchi and Sokoto, which found high

percentages of zero scores across all reading component skills (Creative, 2018b).

Considering these findings, we recommend the national and state governments explore maintaining the NFLCs to jumpstart OOSC into the formal education system. To ensure all pupils improve their reading skills, comprehensive literacy interventions need to continue to take place in the formal and the non-formal school settings. These interventions should also be part of a broader initiative to promote capacity in the entire education system.

Limitations and Recommendations for Future Research

Caution should be used in interpreting the results of this study. First, the data used are not the result of an experimental intervention to determine the association between reading instruction and reading outcomes, and therefore causality should not be inferred. Rather, we conducted a purposive sampling of schools with a statistically appropriate population of mainstreamed pupils, used a NECG, and employed HLM for analysis. A simple comparison between pupils who attended NFLCs and those who attended formal schools before P4 may have over- or underestimated the impact of attending formal schools on literacy and reading skills. While we draw on a range of covariates that matter for selection into treatment and use comparison groups with very similar characteristics, including attending the same schools, selection bias is still plausible. In the future, where possible, an experimental study could be implemented to achieve more precise estimates of the effects of NFLCs.

Second, the study is limited by logistical constraints that led to fieldwork being done midway through the P4 year. This design limits our analysis. A baseline score/pre-test would

have been useful in allowing us to examine differential rates of growth and dropout in P4 for mainstreamed and non-mainstreamed pupils. We cannot determine the effect, if any, of differential attrition on our sample. However, given the difficulties of collecting data in conflict and crisis settings, we feel the analyses that we have presented are nonetheless a positive contribution to the field.

Third, we use pupil survey reports to build the covariates that can determine selection into treatment. These pupil survey reports could be less reliable and accurate, and likely contain more measurement error, than those obtained through parent surveys. In the future, greater parental involvement could provide more reliable data on these issues.

Conclusion

Overall, we find that mainstreamed pupils read at the same level as non-mainstreamed pupils. We argue that this is a positive finding, due to the challenges that mainstreamed children faced when they were out of school, including exposure to conflict, school closures, and other traumas. While children who remained in formal schooling throughout may also have been exposed to conflict, the fact that their schools remained open and their families were able to continue sending them safely speaks to the different experiences these groups of children had earlier in their schooling.

However, we also found that reading assessment scores were low for both mainstreamed and non-mainstreamed pupils in Sokoto and Bauchi. It is important to interpret these results from a systems perspective. In Nigeria as whole, less than 25% of primary

school completers can read[1] (World Bank, 2018), and 35% of primary school age children are not enrolled in formal schooling. NFLCs play a key role in enabling OOSC to access education and enter formal schooling. Overall, NFE has also shown promise in reducing social exclusion and marginalization (Thompson, 2001), as well as improving social equity (Hopper, 2008), self-efficacy (Shephard, 2014), and life skills (Nath et al., 1999). Therefore, beyond reading outcomes, it is possible that pupils in NFLCs are acquiring many of the socio-emotional and academic skills needed to achieve their full potential. We recommend maintaining the NFLC nine-month instructional model followed by mainstreaming pupils into the formal school system.

Funding statement

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[1] As measured by the literacy rate defined as being able to read a three-**sentence passage either "fluently without help" or "well but with a little help" (World** Bank, 2018, p. 45).

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Appendix

Sample of literacy instruction knowledge questions for head teachers and teachers.

Source: Northern Education Initiative Plus, Head Teacher Interview and Teacher Interview.

1a. Reading words correctly indicates if a child understands the text.

1b. Reading with expression indicates if a child understands the text.

2a. Illiterate parents cannot assist their children to learn to read.

2b. Illiterate parents can play an important role in helping their children learn to read.

3a. Some literacy skills in a child's first language transfer to other language literacy skills.

3b. Literacy skills in a child's first language only benefit the first language.

4a. To teach pupils to learn to read a new word, it is best to show them how to break the word into syllables.

4b. To teach pupils to learn to read a new word, it is best to point at the word and tell them to repeat it.

5a. The teacher's role is to teach pupils all the words they need to know, and they will become good readers.

5b. The teachers' role is to teach skills pupils need so they can learn words independently and they become good readers.