

Improving outcomes for refugee children: A case study on the impact of Montessori education along the Thai-Burma border

Tierney Tobin

University of Colorado: tierney.tobin@colorado.edu

Prairie Boulmier

Kwah Dao: thebanyancenter@gmail.com

Wenyi Zhu

Perkinelmer Healthcare Diagnostics Co, Ltd.: Jessie.Zhu@perkinelmer.com

Paul Hancock

Khom Loy Development Foundation: paul@khomloy.org

Peter Muennig

Columbia University: pm124@columbia.edu

There are 25 million displaced children worldwide, and those receiving schooling are often educated in overcrowded classrooms. Montessori is a child-centred educational method that provides an alternative model to traditional educational approaches. In this model, students are able to direct their own learning and develop at their own pace, working with materials rather than in supervised groups or with direct teacher instruction. Because most children are working alone, teachers have more time to work one-on-one with children even when student-teacher ratios are quite large. This gives teachers increased opportunity to tailor their teaching to the specific needs and strengths of each student. We conducted an evaluation of Montessori classroom conversion for displaced students on the Thai-Myanmar border. We administered the Ages and Stages Questionnaire (ASQ) to 66 children before and after classroom conversion and across treatment and control classroom conditions. We then conducted difference in difference testing. All domains showed meaningful improvements in ASQ scores, with the Montessori students gaining 18 points relative to the traditional students ($p = 0.33$). However, only the personal-social domain of the ASQ was statistically significant (8.8 point gain for the Montessori students relative to the control, $p < 0.05$) in our underpowered sample.

Keywords: Montessori; child-centred education; refugees; ASQ; pedagogy; child development; displaced children; Burma; Thailand

INTRODUCTION

Over half of the 50 million displaced people around the world are children (UNICEF, 2014). Displacement presents significant challenges for young people as they struggle with insecurity, instability and psychological trauma. Some believe that education can mitigate these traumas to some extent by providing “a vehicle for rebuilding refugee children’s lives, through social interaction and gaining knowledge and skills for their future lives” (Crisp, Talbot, & Chipollone, 2001, p. vii). However, this objective can only

be met if it meets both the developmental needs of students, and fosters student learning and achievement.

For refugee children, such measures of educational quality are lacking. Too often, the student teacher ratios in refugee classrooms are very large, the teachers are overwhelmed and undertrained, and the students sometimes come from homes with illiterate parents (Muennig, Boulmier-Darden, Khouzam, Zhu, & Hancock, 2014; Verma, Chan, & Muennig, 2011). Moreover, the students are sometimes under a good deal of psychological stress, thereby limiting their opportunities for meaningful play or interaction time (Boothby 1994; Verma, Lee, Su, Chan, & Muennig, 2010). Relative to their Thai peers, they also face a large number of barriers to school success, ranging from toxic exposures, low parental literacy, and forced separation of the community and family units (Kia-Keating & Ellis, 2007; Lang, 2002; Martin, 2004; Martin, 2005; Pernice, 1996; Su & Muennig, 2005). Thai students, conversely, tend to come from intact families, have access to classrooms with lower student-teacher ratios, and have access to adequate nutrition and universal healthcare (Su & Muennig, 2005). In Thailand, schools tend to teach in Central Thai (the dominant language used in media in Thailand) and, in most public schools, no provisions are made for bilingual or cross-cultural education (Su & Muennig, 2005).

One solution to these persistent problems in refugee learning environments is Montessori education. Montessori classrooms, on average, produce superior cognitive outcomes relative to traditional learning environments in which the teacher is in front of a classroom and delivers content (Lillard & Else-Quest, 2006). Traditional classrooms sometimes provide fewer opportunities for critical or creative thinking or meaningful student-teacher interaction, particularly when the classroom is crowded and students face language barriers (Su & Muennig, 2005). The core components of Montessori include educating the “whole child”, promoting student choice and independence, positioning the teacher as a facilitator and individualizing instruction (Lillard & Else-Quest, 2006; Montessori, 2013). Montessori is one of various educational approaches that is possibly positioned to offer great advantages in a setting in which the student-teacher ratios are large, linguistic abilities vary, students’ emotional and mental health is at greater risk, and parental educational attainment is inconsistent. The Montessori method is possibly also better able to respond to the emotional, social and developmental needs of refugee children because teacher time is freed up to provide more attention to students in need. As some students do independent work and build on their innate curiosity, Montessori educators can focus on other individual students to better nurture them academically and emotionally. Other options for doing so also exist (e.g., the flipped classroom), but this paper focuses on the Montessori approach as implemented in one city in Thailand (Muennig et al., 2014).

In general, there is a need for more research regarding successful educational methods and pedagogy for this disenfranchised population because the existing research does not adequately provide educational planners with the resources or information to develop effective programs (Williams, 2001). We examine the impact of the Montessori method on refugee children’s social, cognitive and motor development using a difference-in-difference approach. We hypothesize that child-centred learning, specifically the Montessori method, is a more effective way of fostering child development and promoting academic achievement in refugee children than traditional schooling for two reasons. First, it allows students to learn independently in the context of very large student-to-teacher ratios. Second, it allows students to engage in a wide array of learning

activities that are largely language independent. For instance, math skills are built by working with materials rather than via verbal instruction.

METHODS

Participants

The Khom Loy Development Foundation (a non-government organization based in Thailand) collected extensive data on a sample of displaced children and their parents from two schools in Mae Sot for internal evaluation purposes. The refugee community in Mae Sot is largely in flux. Some migrants express their desire to live in Thailand permanently whereas others moved to Thailand specifically to send their children to school and, thus, lack the same sense of permanence.

The families in the study represent a convenience sample of non-Thai children aged 3 to 6 in two classrooms within these two schools. One classroom had been converted to Montessori and the other had not. Both classrooms had 60 students with one teacher and one assistant teacher. The “local” classroom was taught in the traditional Thai style, with an emphasis on teacher-driven instruction and repetition. The Montessori classroom focused on child-directed learning and use of specifically designed Montessori materials. All instruction was conducted in Thai. Children who were not native speakers were taught Thai in the classroom, but no other provisions were made. The students generally came from families with very low educational attainment. The students themselves had less than 1-2 years of schooling, on average. The family variables detailed in the chart below illustrate that the participating families from both classrooms have comparable backgrounds; thus, the impact social, economic and cultural factors may have had on the children’s ASQ scores was controlled allowing the researchers to analyse the impact of the educational method used in the classrooms.

The study was found to be exempt from Institutional Review Board review by the Columbia University Institutional Review Board.

The descriptive information on the sample is presented in Table 1. In all, 122 participants (66 children and 56 parents) were interviewed. Data on other household members were collected by proxy (an interview of the primary adult caregiver). Table 1 provides detailed information separated by school.

Table 1: Descriptive statistics

	School		
	Montessori	Local	Total
<i>Family variables</i>			
N	29	27	56
<i>Mean(SD)</i>			
Number of Siblings	2.61(1.31)	2.88(1.61)	2.74(1.46)
Number of Rooms	1.31(0.62)	1.63(0.84)	1.47(0.75)
Number of People Sleeping in each Rooms	4.04(1.50)	3.63(1.33)	3.84(1.42)
Monthly Income (THB)	7874(12794)	8576(8760)	8212(10940)
Annual Income (THB)	67852(38480)	99312(106441)	82977(79614)

		School		
		Montessori	Local	Total
Count (%)				
Marital Status				
	Divorced	4(14.81)	1(3.85)	5(9.43)
	Married	21(77.78)	25(96.15)	46(86.79)
	Separated	2(7.41)	0(0.00)	2(3.77)
	Owned Refrigerator	9(32.14)	11(45.83)	20(38.46)
	Seen Soldiers	26(92.86)	20(76.92)	46(85.19)
	Witnessed Gunfire	15(53.37)	9(33.33)	24(43.64)
	Approached by Soldier	6(21.43)	4(14.81)	10(18.18)
	Witnessed Death	8(28.57)	13(48.15)	21(38.18)
	Harmed by Solider	8(29.63)	3(11.11)	11(20.37)
Religion				
	Buddhism	27(96.43)	23(85.19)	50(90.91)
	Christian	1(3.57)	2(7.41)	3(5.45)
	Muslim	0(0.00)	2(7.41)	2(3.64)
Children variables				
<i>Mean (SD)</i>				
	Mobility	1.32(0.69)	1.05(0.22)	1.20(0.54)
	Self Care	1.68(0.63)	1.67(0.58)	1.67(0.6)
	Usual Activities	1.12(0.33)	1.05(0.22)	1.09(0.28)
	Pain/Discomfort	1.68(0.69)	1.33(0.48)	1.52(0.62)
	Anxiety/Depression	1.72(0.79)	1.57(0.68)	1.65(0.74)
	EQ-5D-5L index value (Thailand)	0.68(0.12)	0.73(0.11)	0.71(0.12)
	ASQ Score-communication	45.56(21.36)	47.5(17.10)	46.5(19.23)
	ASQ Score-Gross Motor	53.52(14.86)	58.33(3.8)	55.78(11.29)
	ASQ Score-Fine Motor	37.96(13.68)	47.39(13.64)	42.3(14.33)
	ASQ Score-Problem Solving	25.74(17.58)	34.79(19.14)	30(18.71)
	ASQ Score-Personal-Social	45.74(15.61)	53.48(9.82)	49.3(13.70)
Parents variables				
<i>Count (%)</i>				
Mother's Education				
	None	5(17.86)	8(30.77)	13(24.07)
	Less than High School	20(71.43)	15(57.69)	35(64.81)
	Above High School	3(10.71)	3(11.54)	6(11.11)
Father's Education				
	None	5(20)	2(9.09)	7(14.89)
	Less than High School	17(68)	16(72.73)	33(70.21)
	Above High School	3(12)	4(18.18)	7(14.89)
Mother's Work				
	Accountant	0(0.00)	1(3.7)	1(1.82)
	Company Work	0(0.00)	1(3.7)	1(1.82)

School			
	Montessori	Local	Total
Construction	1(3.57)	0(0.00)	1(1.82)
Cook (Housewife)	1(3.57)	0(0.00)	1(1.82)
Daily Worker	1(3.57)	1(3.7)	2(3.64)
Factory	1(3.57)	0(0.00)	1(1.82)
Factory Worker	1(3.57)	2(7.41)	3(5.45)
Farmer	2(7.14)	2(7.41)	4(7.27)
Housekeeper	2(7.14)	2(7.41)	4(7.27)
Housewife	4(14.29)	2(7.41)	6(10.91)
Laundry	0(0.00)	1(3.7)	1(1.82)
Look After Children	0(0.00)	6(22.22)	6(10.91)
Restaurant Worker	0(0.00)	1(3.7)	1(1.82)
Shopkeeper	6(21.43)	1(3.7)	7(12.73)
Teacher	0(0.00)	1(3.7)	1(1.82)
Unemployed	8(28.57)	6(22.22)	14(25.45)
Wooden Factory Worker	1(3.57)	0(0.00)	1(1.82)
Father's Work			
Boat Driver	1(4.17)	0(0.00)	1(2.04)
Car shop	0(0.00)	1(4.00)	1(2.04)
Company Work	0(0.00)	2(8.00)	2(4.08)
Construction	2(8.33)	2(8.00)	4(8.16)
Construction Worker	3(12.5)	8(32.00)	11(22.45)
Daily Worker	2(8.33)	1(4.00)	3(6.12)
Driver	1(4.17)	0(0.00)	1(2.04)
Factory Worker	1(4.17)	3(12.00)	4(8.16)
Farmer	4(16.67)	1(4.00)	5(10.2)
Driver	0(0.00)	1(4.00)	1(2.04)
Immigration Police	1(4.17)	0(0.00)	1(2.04)
Painting	0(0.00)	2(8.00)	2(4.08)
Pastor	0(0.00)	1(4.00)	1(2.04)
Security Guard	1(4.17)	0(0.00)	1(2.04)
Shopkeeper	4(16.67)	0(0.00)	4(8.16)
Stone Factory Worker	1(4.17)	0(0.00)	1(2.04)
Trader	1(4.17)	0(0.00)	1(2.04)
Unemployed	2(8.33)	0(0.00)	2(4.08)
Welding	0(0.00)	1(4.00)	1(2.04)
Workshop	0(0.00)	1(4.00)	1(2.04)
Workshop (car)	0(0.00)	1(4.00)	1(2.04)

Data collection and measures

A general household survey was administered to adults and the Ages and Stages Questionnaire (ASQ) was administered to children. The general household interview contained questions pertaining to parental income, household appliance ownership, the number of people per room, whether the respondent had seen soldiers, whether the respondent had witnessed gunfire, and whether soldiers had harmed the respondent.

The age 54-month ASQ was administered to all children in the study (Squires, Bricker, & Potter, 1997). The ASQ generally consists of tasks rather than test questions, rendering it easy to administer in cross-cultural settings. The questionnaire is divided into the following categories: gross motor, fine motor, communication, problem solving and personal-social. The questions were read to participants by one of two multi-lingual interviewers who were fluent in every language spoken by the parents and children in the sample (Burmese, Karen, and Shan). The 54-month ASQ was administered irrespective of the students' age because the students and their parents often did not know their correct age. By applying a test from the upper end of the age distribution, we were able to achieve more variability in test scores than we might have had we applied tests based on the "best guess" of the correct age of each child.

Children were scored on a scale from 0 to 60 based on their performance of certain tasks and activities. If a student scored below a certain cut-off, professionals recommended that the child be referred for a proper diagnostic assessment to determine if there is a developmental delay. Parents, educators and health professionals can use the scores, whether below or above the cutoff, to assess the different development needs of children and respond accordingly. According to Saihong (2010), the ASQ "has great potential for adaptation in Thailand" and is positive in that it encourages teachers and parents to consider the importance of child development in early childhood education (p. 98).

This test was selected by Khom Loy over the tests within the NIH toolbox or other alternative cross-lingual testing modalities because it does not require a computer to use, it measures a broad range of developmental outcomes (e.g., social and motor as well as cognitive outcomes), and because it is relatively brief and simple to execute. The downside of the ASQ is that its cognitive measures are much more rudimentary than the comprehensive battery of cognitive and spatial tests that are available. This study, however, was limited by the needs of the Khom Loy Development Foundation, which originally collected the data. The data was obtained by the researchers as secondary, de-identified data after the testing had occurred.

With respect to the ASQ testing, the same sets of identical materials were used to assess all children. The ASQ was administered to children who were removed from the classroom in groups of roughly three children, who were then separated. The surroundings were similar in all settings (a shaded, quiet outdoor space just outside of the classroom). However, given the large number of children per classroom and the limited staff resources, it was not always possible to keep other children from entering the test environment. Dental data were collected by a medical doctor who conducted a brief visual examination of the child's mouth and rated dentition by the number of teeth with visible decay.

Statistical analyses

The primary outcome measure was the ASQ score. Our approach was to use a difference in difference model, which estimates improvements from the baseline assessment to the year 1 assessment within and across groups. The study was powered to detect roughly an 8-point difference in ASQ scores at an alpha of 0.05 and a beta of 0.8. However, educators on our team felt that a 3-point difference was meaningful. Therefore, the study was underpowered to detect a meaningful difference in outcome measures.

RESULTS

During the study, researchers found some evidence for Montessori's positive impact across the ASQ domains. During the baseline assessment, students at the Montessori school all scored lower than those at the control school. In the follow-up assessment, the students at the Montessori school lessened or closed the gap across all five domains.

Communication

The scores of students at both schools increased dramatically. The children at the Montessori school had scores that were similar to those of their counterparts (a gain of 0.05 points, $p = 0.99$).

Gross Motor

During the follow up, the students from the Montessori school improved their scores on the gross motor assessment by 4.5 points, whereas the students from the control school improved by less than 1 point, resulting in a non-significant but sizable gain of 3.6 points ($p = 0.27$).

Fine motor

At the baseline assessment, the control group scored 9.5 points higher on the fine motor domain relative to those at the Montessori school. In the follow up, the Montessori group scored less than 7 points lower than those in the control group, for a net gain of 2.5 points ($p = 0.56$).

Problem solving

Both groups performed poorly in the problem-solving domain during the baseline assessment, with the control group scoring 34.8 and the Montessori group scoring 25.7, about 9 points lower than the control group. In the follow up, the control group improved their scores by 12.5 points. The Montessori group decreased the gap, gaining 17 points for a difference of 4.3 points ($p = 0.49$).

Personal-social

Here, we found a statistically significant difference in the personal-social domain. During the base-line test, the Montessori group scored over 7 points lower than their counterparts. In the follow-up assessment, however, they scored 1 point higher than those in the control group, for a gain of 8.8 points ($p < 0.05$).

Overall, the Montessori students achieved a total score of just 208.5 points at baseline, reflecting this group's severe disadvantage going into school. The control group scored 240 points overall, a better, but still poor, performance. Nine months later, the control group (with a score of 277) and the Montessori group (with a score of 263 points) were much closer, closing the gap by 18 points. However, these large overall gains were within the range of chance variation in the score ($p = 0.33$). When a more sensitive joint test was applied across each regression, seemingly unrelated regression, we did find that the differences between the groups were statistically significant.

DISCUSSION

Although this study lacked adequate statistical power to detect any but very large differences between groups, we nevertheless found that exposure to Montessori classrooms produced an improvement in the personal-social domain of the ASQ. While the total score was not statistically significant in the standard difference-in-difference approach, it was statistically significant when a more sensitive joint test was used. This suggests that the consistently larger improvement in ASQ scores across domains was not due to chance alone.

Our results are difficult to frame within the context of the larger literature on refugee education because so very little is known about the Shan or the Karen. These groups have largely gone without access to schools. Rather, discussions with UN and non-governmental organizations have suggested that most education occurs in “jungle schools,” or informal schools headed by whatever literate and numerate adults are available in the area (Su & Muennig, 2005). Given this, it is perhaps remarkable that the baseline abilities of these children are so close to age-appropriate means for the ASQ in general. It is also true that the entire field of refugee education research is highly underdeveloped relative to other areas of education (Dryden-Peterson, 2011; Pinson & Arnot, 2007).

The large impact in the personal-social domain might possibly be explained by the structure of the Montessori classroom (Lillard & Else-Quest, 2006). Greater opportunity for free choice and child-directed learning may give value to children’s own agency, thereby reducing interpersonal conflict (Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). Advanced students have time throughout the day to work with others or independently, while needy students may be able to receive more direct attention from their teachers. Having intermittent breaks from other children could give them needed respite from an otherwise intensive social environment. It might also give them a chance to reflect and learn through experience how to best deal with challenging social situations. Preschool and kindergarten are often children’s first time in a structured setting with a large number of other children (Borghans, Duckworth, Heckman, & Ter Weel, 2008; Heckman, 2013; Heckman, Stixrud, & Urzua, 2006). Rather than forcing all the students together, assuming they develop, learn and interact in the same way, Montessori education appreciates these differences and encourages students to value their own strengths and interests. By allowing children to choose their own materials and take responsibility for their learning, self-efficacy could conceivably lead not only to improvements in social skills but also (further down the line) to improved cognitive functioning (Bandura, 1993).

Early childhood education has been identified as an integral period of time to lay the foundation for future success (Heckman, 2013). In impoverished settings, in particular, “school readiness, or the child’s ability to use and profit from school, has been recognized as playing a unique role in escape from poverty in the United States and increasingly in developing countries” (Engle & Black, 2008). Though there is increasing recognition of the importance of early childhood education, there is the unfortunate tendency to underemphasize the importance of interpersonal skill development in favour of academic and work-related skills (Heckman et al., 2006; Heckman 2013). Such skills may be even more important for future success than cognitive skills (Heckman et al., 2006).

The World Bank (2014) states: “the skills developed in early childhood form the basis for future learning and labor market success, and failure to develop these skills can negatively affect educational attainment and productivity and earning potential”. The foundation for success, however, rests on not only the accumulation of specific skills and knowledge but also on nurturing and promoting healthy child development. The five domains assessed by the ASQ are the developmental areas critical to the foundation for future achievement (Squires et al., 1997). The core goals of early childhood education tend to promote and maximize positive development in these areas (Saihong, 2010).

Research has provided evidence that “high quality, developmentally appropriate early childhood programs produce short and long term positive effects on children’s cognitive and social development. High quality childcare can predict academic success, adjustment to school and reduced behavioral problems for children in first grade” (NAEYC, 2014). Child-centred classrooms are becoming more popular around the world as “high quality” due to increasing research that promotes the importance of providing playful learning, hands-on activities and independent choice. These classrooms are more likely to encourage intrinsic motivation and positive peer interaction as well as long-term achievement gains (Lillard, Lerner, Hopkins, Dore, Smith & Palmquist, 2013; Samuelsson & Carlsson, 2008). This case study adds to the existing research by providing evidence of Montessori education’s success personal-social development as measured by the ASQ.

Our study was subject to a number of limitations. First, and most importantly, the study did not have the requisite number of students needed to detect meaningful differences in ASQ scores. Therefore, while we can say that Montessori classroom conversion appears to produce meaningful benefits in the personal-social domain, we cannot make such claims for other domains. The post-hoc SUR analysis that we conducted does suggest that the net impact of Montessori was positive across all domains. Second, while difference-in-difference models can serve as a quasi-experimental approach to program assessment, they fall short of powerful randomized trials needed to fully assess the approach we study here.

CONCLUSION

We hope that this study encourages non-government organizations, government agencies and international agencies working with refugee populations to consider Montessori education as an effective early childhood intervention to promote school readiness and lay the foundation for future success. Fazily (2012) calls for more attention to be paid to “the importance of programs that address the needs of refugee families and how these programs can lead to more collaborative and successful home-school partnerships” (p. iv). Though recent US and European-based studies have provided evidence that “adult-centred learning environments are less positive for young children than more active, child-centred approaches”, this type of program has had minimal testing with refugee populations (Lillard et al., 2013). Our study provides a link between the push in early childhood education for child-directed education and the need for high quality education programs for refugee children. Given the instability and trauma they face, refugee children are in great need of educational interventions that promote both academic achievement and positive child development.

Our study, though limited in sample size, provides evidence for the success of Montessori education in achieving these goals, at least insofar as non-cognitive traits predict future success. Our difference-in-difference model uses a quasi-experimental approach, thereby providing stronger evidence for the outcomes we find than simple regression models. However, much more work must be done before we will know whether implementing the Montessori method actually does a better job of meeting the social, emotional and academic needs of their refugee students. Future research might focus on the socio-emotional benefits of the Montessori method in the refugee context as well as on the cognitive benefits. It is possible, too, that the Montessori method's focus on teaching relevant and useful real-world skills assists refugee students in regaining a sense of normalcy. The ASQ does not test for this, however, and more research in this area is needed as well. High-risk students, including those who have been displaced and been exposed to high levels of stress, are in great need of more effective educational methods that respond to their unique situations and appropriately take into account their strengths and vulnerabilities. It is critically important to understand how to best approach this population. We hope this study will encourage educational policy-makers and leaders to rethink education in refugee settings and better respond to the needs of students and educators.

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