

Symposium Title: Developing, Adapting, and Testing a Research- and Practiced-Based Innovation in SEL for Domestic and International Contexts

In this symposium we bring together three papers that together describe the evolution of an innovation in social-emotional learning (SEL) that is designed to offer a more flexible and adaptable approach to skill building that has high potential for diffusion across settings and contexts. The innovation, called Brain Games, and identified in these papers as a kernel of practice for SEL, targets children's executive function and self-regulation. Over the last seven years Brain Games has undergone a process of adaptation, piloting, and revision in collaboration with user-centered designers and preschool and elementary educators in the US and in education in emergency settings. They have now been tested in five separate studies ranging in design from small pilots to large RCTs. In addition to the specific papers below, the group is joined by an expert discussant who is steeped in research on executive function and self-regulation and related interventions.

Paper 1 describes the development and testing of Brain Games domestically presenting its evolution from a single component of a comprehensive SEL program to a stand-alone strategy designed for preK to 5th grade. The paper describes changes in the structure, content, and features of the games, their implementation and adaptation in school contexts, and results from a delayed implementation design study in three elementary schools.

Paper 2 presents the process of adapting Brain Games for use in Education in Emergency (EiE) settings. The paper describes the process and findings related to the field testing, adaptation of content and training/support packages, and implementation of Brain Games as part of the Education in Emergencies: Evidence for Action (3EA) initiative in Lebanon and Niger. The authors discuss the implications of their findings for other efforts to adapt and implement evidence-based SEL strategies in international EiE contexts.

Paper 3 presents the impacts of Brain Games in EiE settings in Lebanon from a randomized-controlled trial comparing a non-formal academic retention support program, Learning in Healing Classrooms (LIHC), to Brain Games in 66 Syrian refugee communities in the Akkar and Bekaa regions.

Paper 1

Title: Designing and Testing Brain Games: a New Kernel of Practice Focused on Children’s Executive Function and Self-Regulation

Background:

Amid concerning trends that indicate high rates of indifference, intolerance, bullying, selfishness, and cruelty among children and youth, how do we raise children to be caring, ethical, and contributing adults? How do we effectively interrupt the pernicious impact of stress and trauma on foundational and essential skills of executive function and self-regulation that are linked to a host of life outcomes including physical and mental health, higher education, and success in the labor market?¹ Decades of research indicate that reversing such trends requires supporting children to develop social, emotional, and character skills. One common approach to building this combination of skills has been school-based prevention and intervention programs focused on an inter-related set of skills that generally include social and emotional learning, character education, bullying prevention, conflict resolution, 21st Century/life skills, youth development, and more. Among these approaches, those focused on SEL appear to have the largest and most rigorously evaluated evidence base.² An abundance of research has shown that interventions that target social, emotional, and behavioral skills can be successfully implemented in school settings, resulting in valuable outcomes for children.³ This work has been particularly relevant for low-income or at-risk students, as children’s social-emotional skills are particularly sensitive to the negative effects of stress and trauma.⁴

As this summary suggests, significant attention is frequently placed on the development and testing of comprehensive, often highly structured programs, but far fewer researchers and program developers prioritize the need for adapting and personalizing resources to maximize feasibility, sustainability, and impact in the long-run. Research has consistently demonstrated the relationship between effective program implementation and the adaptability and compatibility of SEL programs;⁵ however, the large majority of evidence-based SEL interventions do not provide flexibility in practice, and they frequently view program adaptation as undermining fidelity and impact. Given the prescribed manner of traditional approaches, teachers infrequently have the freedom and flexibility to select the strategies that best fit the needs of their students (e.g., learning style, skill level, interest, etc.). Moreover, a number of other barriers – such as limited time and resources, lack of local-buy in, and poor integration into everyday practice – undermine efforts to bring more comprehensive SEL programming to scale,⁶ and these barriers are likely exacerbated in low-income and low-resource contexts.

There is a pressing need to adapt and test less intensive strategies that are easy to implement outside the context of a comprehensive program, while still achieving meaningful outcomes for children.⁷ Referred to as “evidence-based kernels,” these less intensive strategies are

¹ e.g., Raver & Blair, 2015; Moffit et al., 2011

² Jones & Bouffard, 2012

³ Jones & Doolittle, 2017

⁴ Evans & Kim, 2013; Noble, Norman, & Farah, 2005; Raver et al, 2013

⁵ Durlak & DuPre, 2008

⁶ Jones & Bouffard, 2012

⁷ Jones & Bouffard, 2012

considered the fundamental levers for behavioral change.⁸ SEL kernels are essential, active ingredients in effective SEL programming, hypothesized to be both more potent and also more feasible to implement and therefore may increase initial uptake and sustainability over time.

Objective:

In this paper, we describe the process of adapting, implementing, and testing one such kernel, called Brain Games (BG) which are fun, motivating games that are designed to build children’s executive function and self-regulation skills. In this paper we address the following specific questions about Brain Games using a delayed implementation design:

1. What is the nature of change in student and classroom outcomes from fall to winter to spring of the school year? Do patterns of change align with the delayed implementation design?
2. Is BG implementation (e.g., the # and type of games) associated with greater positive change in outcomes?
3. Is there variation in the effects of BGs by characteristics of children (e.g., gender, grade level, baseline skill)?

Setting/Population:

The test of Brain Games was conducted using a delayed implementation design in 3 low-income, rural preK-5 elementary schools serving primarily African-American students.

Intervention:

Brain Games are quick and fun games designed to build children’s executive function (e.g., working memory, response inhibition, cognitive flexibility, and attention control) as well as broader self-regulation, communication, and social skills. Each of the 31 Brain Games takes about 5-10 minutes to play and can be easily integrated into classroom activities and daily routines, such as transition times and morning meetings. Brain Games were originally designed as one strategy embedded in a comprehensive SEL program called SECURE⁹; however, implementation data showed them to be the SECURE activity most frequently and widely used by teachers, and we consistently saw the greatest impact on the skills specifically targeted by Brain Games. In response to these findings, we began a process of designing and testing Brain Games as a stand-alone strategy that can be used flexibly by teachers to build executive function and self-regulation skills (1) at the time of the day that works best for them, and (2) using the games that are best suited to student need, classroom structure, and teaching style.

Research Design & Data Collection:

The pilot study was conducted using a delayed implementation design in 3 low-income PreK-5 elementary schools in a southern state (student fall n=939). Classroom teachers and school staff (e.g., custodial and administrative staff), were trained in early fall 2015 (or in winter 2016) and implemented BGs for the remainder of the year. In fall, winter, and spring of 2015-2016 we gathered three primary forms of data in all schools:

Classroom Observations. Trained observers rated (a) *Teaching Strategies and Classroom Practices* (i.e., classroom structure and management, discipline, and supports for SR and EF) (10 items; $\alpha = 0.83$) and (b) *Classroom Regulation* (i.e., the proportion of children displaying regulated behavior (0-100%) (10 items; $\alpha = 0.96$).

⁸ Embry & Biglan, 2008

⁹ Jones, Jacob & Bailey, 2014

Teacher Ratings of Regulation Skills. Teachers rated EF and SR skills of each child in their classroom (20 items; $\alpha = 0.96$).

Weekly Implementation Logs. Teachers completed tracking logs that detailed which Brain Game they played, when they played, if they engaged in pre-game or post-game talk and how it went.

Results:

Implementation data indicate that teachers and other school adults played the games frequently throughout the school day with 80% of teachers reporting they played 1-2 games per day. With no specific designated SEL time in the schools, teachers found Brain Games to be easy to adapt and integrate into their daily practice. Preliminary findings based indicate that children playing Brain Games at least once per week for a full school year demonstrated larger gains in teacher-reported regulation skills and larger reductions in disciplinary problems than children who played Brain Games for only half of the year. Moreover, classrooms in which Brain Games were implemented all year were observed to have more positive teaching practices and higher levels of classroom regulation overall.

Conclusion:

This work suggests that a kernel of practice for SEL can be successfully extracted, adapted for use as a stand-alone strategy, and implemented with teacher and staff choice in high-risk elementary school settings. Overall, findings indicate that impacts generated from this approach parallel those identified using more time intensive and comprehensive approaches to SEL. Implications for the adoption and implementation of SEL strategies domestically and internationally will be discussed.

Paper 2

Title: Brain Games for Education in Emergencies: Adaptation and Implementation Findings

Background:

There is growing interest among international NGOs to embed high-quality social-emotional learning (SEL) programs into education in conflict settings (INEE, 2016). Adaptation and implementation are key factors that influence program outcomes (Durlak & DuPre, 2008); however, little is known about how to adapt evidence-based SEL programs for successful implementation in emergency contexts (Masten & Narayen, 2012). Most SEL research is conducted in US-based settings, and questions about feasibility, sustainability, cultural appropriateness/ receptivity, and fit-for-purpose remain largely unexamined in international education in emergency (EiE) contexts. Furthermore, EiE settings face a number of specific challenges that can undermine the successful implementation of traditional SEL programming. These include: limited resources; high mobility among displaced students and families; low literacy rates, limited training, and high burn-out for teachers; and changing political circumstances that can interrupt NGO's educational program offerings (Wolf et al, 2015).

For these reasons, a low-cost targeted (LCT) approach to SEL may be well suited for EiE settings. LCT strategies, or kernels (Embry & Biglan, 2008), are the essential active ingredients in effective SEL programming, hypothesized to be more potent and more feasible to implement and therefore may increase initial uptake and sustainability over time (Jones & Bouffard, 2012). They are designed to be short, inexpensive, easy to train and implement, and flexibly adaptable to the needs of particular students, classrooms, teachers, and contexts.

In this paper, we describe the process of adapting and implementing one such kernel, called Brain Games, for EiE settings. Initially developed as part of a comprehensive, evidence-based SEL program (Jones, Bailey, & Jacob, 2014), Brain Games are 5-10 minute activities that are designed to build children's executive function and self-regulation skills (e.g., working memory, inhibition, flexibility, and attention control) and can be easily integrated into daily classroom routines and transitions. Prior research found Brain Games to be effective at building children's skills and improving teacher practices in low-income US classrooms (Jones, Barnes, & Bailey, 2017). In partnership with the International Rescue Committee (IRC) and NYU Global TIES, in 2016-2017 we adapted and tested Brain Games for use in international settings, as part of the Education in Emergencies: Evidence for Action (3EA) initiative.

Purpose:

The purpose of this paper is to describe the process and findings related to the field testing, adaptation of content and training/support packages, and implementation of Brain Games during Year 1 of the 3EA study. We will discuss our findings in relation to (a) preliminary impact findings of Brain Games in Lebanon and Niger (i.e., how implementation data can help explain unexpected or null findings in the impact study), and (b) implications of our findings for other efforts to adapt and implement evidence-based SEL strategies in international EiE contexts.

Setting:

In 2016-2017, the 3EA study took place in 66 communities (4600 students) in Lebanon, and in 30 schools (1800 students) in Niger. In both countries, the students receiving Brain Games were part of IRC's Learning in a Healing Classroom (LIHC) tutoring program. IRC's LIHC programs are offered 3 days per week; they focus on creating a safe, predictable and nurturing learning environment for children affected by conflict and crisis while also providing support in math, literacy, and language skills. LIHC is a complementary approach to the formal education systems available to refugees, which helps displaced children cope with trauma they face as well as catch-up since many are students with interrupted formal education.

Intervention:

In the 3EA study, IRC tutors were asked to play Brain Games three times per day, 10 minutes each, for a total of 30 minutes per day. Tutors were expected to implement this plan three days each week. The intervention cycle in Lebanon was 9 weeks in duration; in Niger was 11 weeks.

Research Design:

This project was conducted in the context of a RCT test of IRC's LIHC approach¹⁰. Brain Games were added to the intervention group in cycle 2 of each country, to explore whether the addition of LCT SEL strategies would have a complementary effect on children's outcomes. Our purpose is to examine adaptation and implementation findings.

Data Collection and Analysis:

Adaptation of Brain Games was informed by a series of field-testing visits and observations, and unstructured interviews with in-country staff (IRC technical advisors, local teachers and teacher trainers). Implementation data from 2016-2017 include: (a) Brain Games training pre/post test; (b) daily activity logs completed by classroom teachers that document the frequency, timing, and specific Brain Games played, as well as why teachers selected the games and any adaptations they made; (c) weekly reflection notebooks that include teachers' feedback and experiences playing the games – specifically, what went well, and what didn't go well; (d) monthly documentation from coaches/mentors regarding general teaching practices and the content addressed during monthly Teacher Learning Circles; and (e) twice-per-cycle classroom observations.

Findings:

Here we report findings from the Brain Games contextualization and adaptation process and preliminary implementation data from Lebanon and Niger. Results of the contextualization suggested five key considerations for adaptation: cultural relevance, context sensitivity, developmental salience, teacher resonance, and feasibility and fit. The application of these considerations to Brain Games, as well as key differences between the adaptations for Lebanon and Niger, will be discussed.

¹⁰ See 3EA research design in Figure 1 (Lebanon) and Figure 2 (Niger) of the Appendix.

Data from a sample of daily activity logs in Lebanon suggest that (a) Brain Games implementation was relatively stable during the 9-week period, (b) tutors implemented Brain Games with the expected dosage (3 times/day) 88% of the time, and (c) tutors played all Brain Games, with varying frequency. Tutors and field staff provided additional information about adaptations, the cultural fit and feasibility of the materials. Additional analysis, including implementation data from Niger, will be included in the final presentation.

Conclusions:

We expect our findings to inform growing knowledge about the feasibility of adapting and implementing low-cost targeted SEL strategies in education in emergency settings; and to inform future processes of contextualization and adaptation of SEL to meet the local needs of students as well as better support teachers during the implementation of SEL LCTs.

Appendices

Appendix A. References

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Appendix B. Tables and Figures

Figure 1. 3EA Lebanon 2016-2017 Randomized Control Trial Design

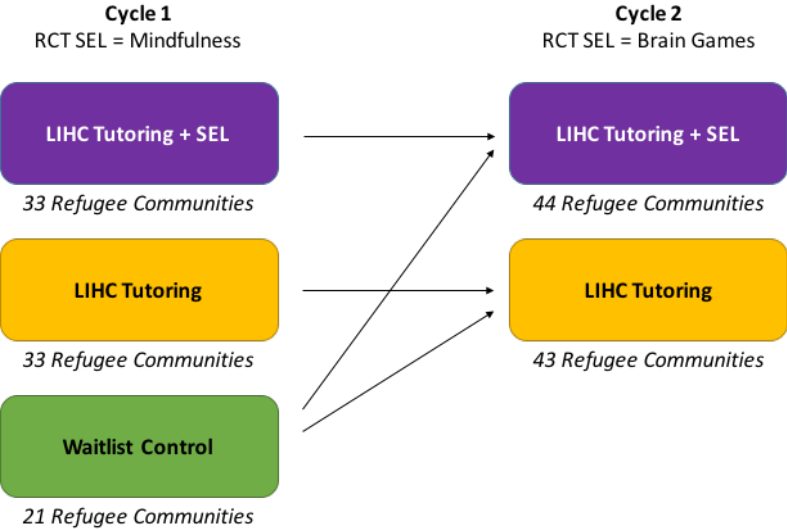
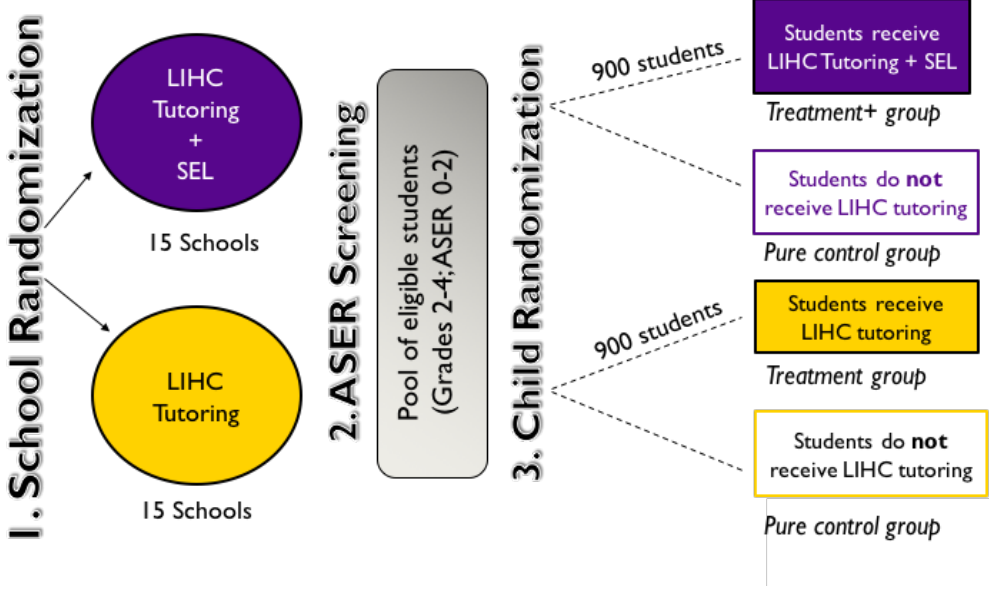


Figure 2. 3EA Niger 2016-2017 Randomized Control Trial Design



Paper 3

Title: Brain Games as a Low-Cost Targeted, Complementary Intervention: Impacts on Children's Social-Emotional Outcomes among Syrian refugees in Lebanon

Background

The world currently faces the largest refugee crisis since WWII¹¹. Lebanon alone, a nation of approximately 4 million citizens, is sheltering over 1 million registered Syrian refugees¹². This increasing population of refugee children has often experienced unspeakable adversities and growing up in unpredictable and low-resource environment that can hamper their healthy cognitive and social-emotional development¹³. Whereas the programs targeting of social-emotional learning (SEL) has been shown to have measurable effects on improving children's social-emotional and academic outcomes¹⁴, designing and implementing such programs are challenging in the conflict-affected settings with low-resource highly-mobile populations, such as Syrian refugee children in informal settlements in Lebanon. Embedding low-cost programs targeting specific foundational developmental SEL skills, such as executive functioning and self-regulation skills as a complement to existing academic services maybe a strategy to maximize efficiency in program delivery and support holistic development of refugee children in educational settings.

Objectives

As a part of a randomized-controlled trial of a non-formal academic retention support program, the Learning in Healing Classrooms (LIHC), this study evaluates the impacts of Brain Games program complement as compared to academic school-retention support alone. Specific research questions are:

- (1) Does the embedded Brain Games program improve children's executive function (attention, inhibition) and emotional and behavioral self-regulation skills (emotion dysregulation, aggression), over and above the LIHC alone?
- (2) Does the embedded Brain Games program improve children's perceived mental health and public school experience, over and above the LIHC alone?

Setting and participants

A total of 66 Syrian refugee communities in Akkar and Bekaa regions of Lebanon participated in the study. From these communities, 4,592 children (49% girls) enrolled in the Learning in Healing Classrooms program. The participants include children of wide range of age, ranged from 5 to 16 (M=9.96, SD=2.38), attending first to ninth grades in Lebanese public school.

Intervention

¹¹ UNHCR, 2016

¹² UNHCR, 2016

¹³ Shonkoff et al., 2012; Sirin & Roger-Sirin, 2015

¹⁴ Durlak et al., 2011

Brain Games are short game-like activities played in between subject matter transitions that use movements and playfulness to build cognitive control. The games are designed to target core executive functioning skills—working memory, attention, and inhibitory control—that research indicates provides the foundation for long-term social competence and academic achievement¹⁵. Brain Games were embedded in a LIHC retention support programming for the treatment group. LIHC provides Arabic, math and second language (English or French) instruction infused with general SEL principles and designed to build the competencies needed to succeed in Lebanese public schools.

Research Design

Participating Syrian refugee communities were assigned to one of two intervention groups in the 2016-17 school year: a LIHC group ($N=33$) and a LIHC + SEL group ($N=33$). The intervention was designed to be implemented and evaluated in two stages: Cycle 1 (16 weeks): LIHC vs. LIHC + Mindfulness; and Cycle 2 (16 weeks): LIHC vs. LIHC + Brain Games. Both the LIHC and the LIHC + SEL group had access to three days (8 hours) per week of LIHC curriculum for 2 cycles. In addition, LIHC + SEL group also had access to participate in Mindfulness (Cycle 1) and Brain Games (Cycle 2) activities embedded between academic classes, three 10-minute sessions a day, 90 minutes a week. This study focuses on the testing the impacts of Brain Games implemented in Cycle 2.

Data Collection and Analysis

Students were individually assessed through verbal interviews by trained local assessors three times across the academic year. We utilize the data from the midline (pre-Cycle 2) and endline (mid-Cycle 2) waves. The endline data were collected after 8-10 weeks of Cycle 2 implementation to avoid overlap with Ramadan, when attendance rate is low. Data are collected on children's: (1) executive function (teacher report¹⁶, assessor report¹⁷, tablet-based direct assessment¹⁸), (2) emotion dysregulation¹⁹ and aggression²⁰ (scenario-based assessment), (3) Perceived public school climate²¹ and school stress²² (4) internalizing symptoms (self-report)²³.

Preliminary analyses were conducted using a series of regression models with standard errors adjusted for clustering. Censored distribution of the outcomes, commonly found in psychological assessments due to ceiling or floor effects, were addressed using tobit regression models. Various site and child characteristics and children's pre-test (midline) scores of the outcomes were included in the models as covariates. Further analysis will be conducted using multilevel structural equation models with multiply imputed data to address various source of

¹⁵ Best, Miller, & Naglieri, 2011; Blair & Raver, 2014

¹⁶ Brain Games Executive Function Teacher Survey: Jones, unpublished manuscript

¹⁷ Preschool Self-regulation Assessment—Assessor Report: Smith-Donald et al., 2007

¹⁸ Rapid Assessment of Cognitive and Emotional Regulation (RACER): Hamoudi & Sheridan, 2016. Analysis of this measure is not included in the current abstract

¹⁹ di Giunta et al., 2017

²⁰ Dodge et al., 2015

²¹ Godfrey et al., 2012

²² Compas et al., 2001

²³ Arabic Moods & Feelings Questionnaire, Tavitian et al., 2014

bias in causal inference, including measurement errors, missing data, and multiple-outcome testing.

Findings

Preliminary results find no significant difference between LIHC and LIHC + Brain Games conditions in teacher- and assessor-report executive function measures, nor in emotion dysregulation. However, we found that students in LIHC + Brain Games condition were less likely to react aggressively in ambiguous social situation ($b=-.15, p<.01$). Interestingly, we found that that students in LIHC + Brain Games condition reporting higher level of internalizing symptoms ($b=.82, p<.05$) and higher level of perceived school-related stress ($b=.14, p<.05$), while no difference in perceived school climate.

Conclusions

Overall, we found mixed impacts of Brain Games in its short-term first-time implementation. One explanation maybe that the Brain Games help students to be more aware of their own feelings and social situations that may temporarily heighten, perhaps accurately, their perception of stress and internalizing symptoms. While it is encouraging that the students in Brain Games condition are better able to regulate their aggressive behavioral urges, the teachers' and assessors' observations do not show the effects of Brain Games in cognitive control, i.e., executive functioning. Future analysis including performance-based measure of executive function and psychometric and descriptive examination of the measures will provide further insight to the findings.

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