Authors' response

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Science progresses through healthy debates and challenging viewpoints. In this vein, we welcome critical evaluation of our work. Unfortunately, the commentary [1] on our documentation of our successful effort to disseminate Fun 5—a physical activity and nutrition program for children [2]—is, we feel, misplaced and missing the larger issues at hand.

Critically re-evaluating our physical activity (PA) evidence supporting successful dissemination of the Fun 5 program, which used Sports, Play and Active Recreation for Kids (SPARK) AR as its main evidence-based PA component, we cannot agree with Beets and Huberty's conclusions. The pilot study revealed positive results in terms of lesson context, whereby intervention sites increased time devoted to play and decreased class management time compared to control sites [3]. This alone was a promising finding, and should not be ignored. This evidence demonstrates that after-school group leaders could rearrange their daily after-school schedules to incorporate significantly more PA-related time, without altering total after-school time. This unveiled the opportunity to increase children's PA during after-school via improved staff time management—an inexpensive, yet tailored intervention strategy. Admittedly, the first part of the pilot revealed no observed differences in children's PA time during the after-school program [3]. However, the self-report data revealed a significant increase in total daily strenuous leisure time PA [3], which included PA performed outside of the after-school program. This increase demonstrates treatment effect extending beyond the after-school setting and into everyday life of the children.

The positive results regarding lesson context and children's total daily strenuous leisure time PA indicates program effectiveness and, more importantly, we learned of several areas of improvement. Of these improvements, the most significant observed was the maintenance of group leaders' support, enthusiasm, and motivation when delivering the SPARK AR component. Such observations informed dissemination planning, with all the stakeholders involved agreeing that dissemination was appropriate and worthwhile.

The intervention was implemented in the delayed treatment control sites, resulting in a total of 13 elementary after-school programs [4] receiving the

Fun 5 pilot intervention (grades 4–6, $n=533$; we thank the commentary authors for providing the opportunity to emphasize this point, which further strengthens the evidence described in our paper). Baseline observations across the 13 sites demonstrated that students were sedentary during the majority of time spent in the after-school program (87.1 % of after-school time was spent standing, sitting and lying down) [4]. Among all participating after-school sites, the Fun 5 intervention generated significant decreases in the time children were observed standing, sitting and lying (21 % decrease) and increased participating children's moderate-to-vigorous physical activity (MVPA, 140 % increase) [4]. Self-reported moderate intensity PA and instrumental attitude also significantly improved. Strenuous or mild PA, other mediators, lesson context, and self-reported sedentary activities did not change over the course of the pilot [4].

As Beets and Huberty [1] correctly noted, changes in self-reported PA were nonsignificant in the subsample of Fun 5 sites we specifically monitored for BMI changes. Similarly, observed changes in PA time among the overall sample revealed a nonsignificant average increase in MVPA of about 20 minutes per week (MVPA minutes increased from 252.35 ± 220.09 to 272.00 ± 222.62 , $p > .05$) during that study year for those sites [5]. However, Beets and Huberty [1] overlooked or neglected to recognize two notable outcomes highlighted in the Fun 5 BMI evaluation: (1) participating children not meeting the guidelines for PA, who are arguably in the greatest need of activity, significantly increased their PA levels from $125.26 (\pm 76.03)$ min per week at T1 to $222.18 (\pm 180.90)$ min of PA per week at T2 ($P = < 0.01$) [5]; and (2) the main purpose of that Fun 5 evaluation was to document potential changes in youth weight status; and, as we report in that evaluation, results indicated no BMI percentile change over the observed school year which countered secular trends [5].

Although some nonsignificant effects across some indicators challenge program effectiveness, the remarkable reach of the Fun 5 intervention to over 90 % of Hawaii youth in the after-school program is indisputable. Similar to previous dissemination efforts, the Fun 5 program is not without limitations and requires continuous efforts to optimize its targeted success and relevance to diverse populations. Similar to the critical implications of internal validity, and arguably a larger

challenge for applied researchers, is the achievement of external validity at a level high enough to produce population-level health improvement. The unmatched statewide reach and longitudinal sustainability of the current Fun 5 intervention are undoubtedly superior to previous efforts, and underline the program effectiveness not appreciated in Beets and Huberty's commentary [1]. Although not yet optimized, current intervention effects are in the positive direction; and when this effect is multiplied over the impacted youth population (20,000+ children in the latter years of implementation), the *impact* of Fun 5 (reach $\times$ effectiveness) is, without a doubt, substantial and meaningful.

Finally, the authors of the commentary mention the cost of SPARK and that "Pre-packaged commercialized programs are expensive and time consuming, considering program materials, staff training, and implementation. Perhaps the most detrimental outcome from advocacy of programs shown to be ineffective is the potential demoralization of after-school program leaders and staff from the inability to change children's activity levels even after substantial investments in programming and training have been made." [1] Frankly, this comment has no relevance to the reported Fun 5 program. As we reported previously, the program only costs \$1/month/child [2]—which includes the cost of a comprehensive evaluation (removing the comprehensive evaluation would decrease costs by about 1/3). Further, the enthusiasm of the group leaders implementing Fun 5, as evidenced in the reported process evaluation, sustainability, and organizational results are overwhelmingly positive, especially as the program reached maturity in the later years [2].

Now to the bigger picture—our paper was sharing the lessons learned from a successful dissemination, which we believe can be successful in similar contexts and among similar child groups. However, we never proclaim this as a one-size-fits-all program.

In fact, we are continuing to explore ways to improve the implementation such as: focusing the SPARK AR portions to target more strenuous PA and "pocket" activities which are short 5–10 min PAs that could be done before children start their homework at the very beginning of the after-school program; including hands-on food preparation experiences for the nutrition component; and conceptualizing a family component. The program and its dissemination will have to be tested further, in different populations and contexts. As researchers, we recognize that effective dissemination involves examination beyond the recent Fun 5 dissemination project and paper. In Hawai'i, Fun 5 was effective with a 90 %+ reach to children in need. We continue to implement and learn and continue to improve and promote others to do something like this. In sum: Focusing on a piece of the picture misses important results and perfection is unrealistic—collect convincing evidence; figure out how to disseminate; continue to refine and improve along the way; and motivate others to do likewise.

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