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Impacts of an earn-a-bike cycling education program on children's time spent cycling

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ABSTRACT

Background: Cycling is a source of physical activity that is feasible and beneficial to health, yet is underutilized by youth in many countries. Bike gifting and education programs are sometimes delivered to youth to support cycling. This study aimed to assess impacts of a bike education program that involved earning a bike (called Earn-a-Bike) on children's time spent cycling and attitudes and perceptions of cycling.

Methods: The Earn-a-Bike program was delivered after school to 38 5th graders living in low-income urban communities, at three different schools. Participants wore global positioning systems (GPS) trackers to provide objective measurements of time spent cycling before and after the program. Participants also completed a pre and post survey and parents completed a post survey on perceptions and attitudes. Statistical models tested changes in time spent cycling and survey responses.

Results: Time spent cycling increased from 12.4 to 21.5 min per week (68% increase; $F[1, 23.7] = 6.49$; $p = .018$), with similar increases observed between boys and girls and across schools. 59% of trips occurred on the weekends and 27% occurred in the evenings on weekdays, and student survey data corroborated this information. Students reported that the top reasons they participated in the program were to learn about bike safety (66.7%) and to learn how to take care of a bike (66.7%). Parents had positive attitudes/perceptions of the program (85–100% agreement with positive statements).

Conclusions: Bike education programs that result in the child earning a bike appear promising for increasing the currently low rates of cycling and active transportation in youth, though multilevel strategies are likely needed to support larger increases in cycling.

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1. Introduction

Physical activity in youth can support the prevention of obesity and other chronic diseases, and benefits mental health and cognition (US Department of Health and Human Services, 2018). Yet, many children do not meet the recommended 60 min/day of physical activity, and physical activity declines substantially as children reach adolescence (Katzmarzyk et al., 2018). Cycling is an important source of physical activity that is underutilized in children living in the United States and many other countries (Carlson et al., 2015b). Numerous studies have shown that youth who cycle typically obtain greater amounts of overall physical activity have greater levels of fitness and a lower risk for cardiovascular disease than youth who do not cycle (Oja et al., 2011).

Barriers to cycling include lack of knowledge, skills, safety from traffic, a supportive built environment, and access to a bike (Forman et al., 2008). Such barriers can be greater in lower-income neighborhoods (Sallis et al., 2011), and among children with higher risk for obesity and other health concerns (Frederick et al., 2014; Karlamangla et al., 2010). Cycling education and promotion programs that address these barriers are somewhat common in Safe Routes to School efforts (Stewart et al., 2014), which aim to support children to walk or bike to school (Safe Routes Partnership, 2018). These programs often involve teaching children how to ride safely and confidently, use proper hand signals, and conduct basic bike maintenance (Chandler et al., 2015; Hooshmand et al., 2014; Lachapelle et al., 2013; Wallace and Sutton, 2015), and sometimes involve gifting students a bike (Children's Hospital Colorado, 2019). While such programs have been shown to be effective for improving knowledge, skills, and attitudes (Chandler et al., 2015; Hooshmand et al., 2014; Lachapelle et al., 2013; Wallace and Sutton, 2015), few studies have evaluated their impact on cycling rates, an important outcome related to physical activity promotion and chronic disease prevention. Furthermore, although the few existing studies that have evaluated changes in cycling rates after delivering cycling education have shown promising increases in cycling, they were limited by relying on self-report and imprecise/global measures (Sersli et al., 2018).

The present study addressed the aforementioned gaps in research by using objective data from global positioning systems (GPS) trackers to investigate time spent cycling before and after a cycling education and bike gifting program, called "Earn-a-Bike". The Earn-a-Bike program was delivered after school to 5th graders (approximately 10–11 years old) living in low-income urban communities.

2. Methods

2.1. Participants

Participants (N = 38) were 5th graders from the three public elementary schools that were located in the Northeast Kansas City geographic area. This area was targeted because it consisted of traditionally underserved neighborhoods in Kansas City, MO, USA, and populations that experience disproportionately high rates of chronic diseases (Frederick et al., 2014; Karlamangla et al., 2010). Although the present research study was focused on investigating the impacts of the Earn-a-Bike program, all students at these schools received a cycling lesson and safety training as part of their school's Physical Education program during the semester prior to the Earn-a-Bike program. The cycling lessons and safety training was delivered by BikeWalkKC and a prerequisite for participating in the Earn-a-Bike program. This training was based on the League of American Bicyclists Smart Cycling curriculum (League of American Wheelman, 2019a,b) and topics included helmet use, hand signals, common road hazards, and tips for safely riding near cars.

Because the Earn-a-Bike program was delivered after school, only students who regularly attended the school's after school program were invited to participate. Each school's after school program coordinator assembled a group of 5th graders to attend a brief informational session held during the afterschool program. Students were told that the session was for 5th graders who were interested in receiving and learning how to take care of a bike. Students who already had a bike or had access to a bike were still eligible to participate because they may have wanted to receive a new bike (e.g., one with a better fit) or their own bike (e.g., in instances when a bike was shared with siblings). During the event, BikeWalkKC staff presented information about the Earn-a-Bike program and distributed permission forms for students to take home and discuss with their parent(s). Enrollment was on a first come first served basis, with a targeted enrollment of approximately 15 students at each school due to available resources. Because students were hand-selected by the after school program coordinator and attendance was not tracked at the information sessions, a participation rate was not able to be calculated.

Students who enrolled into the Earn-a-Bike program were invited to participate in the research study by the evaluation staff. One week prior to the start of the program, an opt-out study information letter, available in English and Spanish, was mailed to each Earn-a-Bike participant's home to explain the study procedures and provide an opportunity to opt out of data collection by calling, mailing, or emailing the study team. Additionally, on the first day of data collection students were given another opportunity to opt out of the research study but still participate in the Earn-a-Bike program. All study procedures were approved by the Institutional Review Board at Children's Mercy Hospital Kansas City.

2.2. Intervention

BikeWalkKC is a non-profit bicycle-pedestrian advocacy organization that works to make the Greater Kansas City a safer and more accessible place to walk, bicycle, live, work, and play (BikeWalkKC, 2019). Their activities include delivery of youth and adult education programs and advocacy of policies that support walking and biking.

The Earn-a-Bike program was delivered after school for 60–90 min each day for five consecutive days during one week, concluding on the 6th day with a parent engagement session during which participants received a bicycle and helmet. Students were told that they needed to attend at least 4 of the 5 sessions to earn the bike. The Earn-a-Bike curriculum covered basic bicycle maintenance topics

through hands on experience with trained and certified League Cycling Instructors (League of American Bicyclists, 2019a,b). The curriculum was designed by BikeWalkKC based on basic maintenance principles. Lessons included information on bicycle parts, tools, and maintenance, such as patching flat tires, adjusting brakes, bicycle cleaning and storage, and a review of safe cycling skills. The bikes were used bikes that were donated by community members/partners. Each bike received a safety evaluation, repair when applicable (some bikes were discarded), and tune up from a certified bike mechanic.

2.3. Study design and data collection procedures

A single group pre-post design was used to evaluate the Earn-a-Bike program. Pre and post measures were collected to assess time spent cycling and physical activity, via Global Positioning Systems (GPS) trackers and accelerometers, and student attitudes and preferences related to cycling, via survey. Fig. 1 shows the assessment timeline. The combined GPS/accelerometer assessments occurred the week immediately before and after the one-week intervention. The student pre-intervention survey (baseline) occurred the semester prior to intervention delivery, and the student and parent post-intervention surveys occurred one week after the intervention was delivered, at the end of the post-intervention GPS/accelerometer wear period. Two schools received the Earn-a-Bike program in the spring and one received it in the fall. The program is delivered outdoors, so program delivery and device data collection occurred during months when weather conditions were generally favorable. Participants were given a $10 cash card and a t-shirt for returning the GPS at the end of the pre assessment, and a $10 cash card and bicycle multi-tool for completing the post assessments.

2.4. Measures

2.4.1. GPS and accelerometer tracking

Participants wore a Qstarz BT-Q1000XT GPS tracker and ActiGraph GT3X-BT on a belt at their right hip. At each time point, participants were instructed to wear the belt for 7 days, during all waking hours, except when bathing or swimming. Latitude and longitude were collected at 15-s epochs. The ActiGraph was included simply to identify non-wear time, based on the Choi algorithm with a 90-min threshold (Choi et al., 2011). A day was considered valid if the accelerometer had been worn for ≥600 min. The Personal Activity and Location Measurement System (PALMS) Version 4 was used to remove invalid GPS fixes due to satellite interference and calculate speed and distance between GPS fixes. Consecutive fixes were categorized by PALMS as trips if they spanned ≥100 m over ≥60 s with an average speed of ≥1.5 km per hour (Carlson et al., 2015a,b). Trip pauses (i.e., no/little movement) were allowed for up to 180 s. If the 90th percentile speed of a trip was ≥25 km per hour it was classified as a vehicle trip. If 90th percentile speed was between 10 and 24 km per hour the trip was classified as a bicycle trip, and trips with 90th percentile speeds <9 km per hour were classified as pedestrian trips (Carlson et al., 2015a,b). The signal-to-noise (SNR) parameter was used to minimize false trips which can occur when there is signal interference due to being indoors. Fixes with a SNR >225 were assumed to be outdoors (Lam et al., 2013), and only trips for which >50% of the fixes were outdoors were investigated in the present analyses. This threshold was optimized by manually observing a subset (≈20%) of the GPS tracks in Google Earth. The PALMS trip mode detection algorithms showed good criterion (Carlson et al., 2015a) and concurrent (Carlson et al., 2015b) validity in previous studies. The final variable of interest was minutes spent cycling, which was calculated for each valid wear day and averaged across days to create a participant level file to support the statistical analyses. Although the direct target of the intervention was time spent cycling, overall moderate to vigorous physical activity (MVPA) was included as an additional outcome variable. Minutes per day of MVPA was assessed using the Evenson cut point applied to 15-s epochs (Evenson et al., 2008), cycling time was considered MVPA even when the accelerometer count value did not reach the MVPA cut point threshold.

2.4.2. Student survey

Self-reported sex, frequency of biking, and attitudes/perceptions around bike riding were assessed through a student administered survey at two time points. The pre survey was administered the semester prior to the Earn-a-Bike program, at the end of the cycling lessons and safety training delivered during Physical Education. The post survey was administered one week after the conclusion of the Earn-a-Bike program, when the device belt was returned. Participants reported how many days in the past week they rode a bicycle (0–7) and how often they rode: to or from school, after school, and on the weekends, with response options of 'not at all' = 0, 'sometimes' = 1, and 'often' = 2. Participants also responded to the statements "I like riding a bike," "I feel confident riding a bike," and "I feel safe riding a bike on the street" by circling an emoji with the anchors 'not at all' = 1 (unamused; 😒), 'a little' = 2 (neutral; 😐), 'somewhat' = 3 (smiling; 🙂), and 'a lot,' = 4 (smiling large; 😃). In the post Earn-a-Bike survey, students were also asked to indicate (yes/no) the reasons that they joined the program from a list of options: to get a bike, to hang out with my friends, to learn how to take

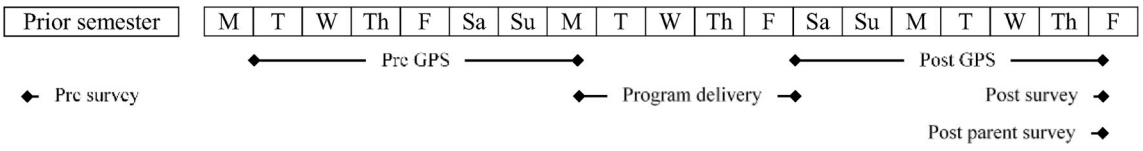

Fig. 1. Timeline showing study assessments and Earn-a-Bike program delivery.

care of a bike, to learn how to ride or get better at riding a bike, to learn about or get better at bike safety, a parent or family member told me to, or to earn-a-bike for someone I know.

2.4.3. Parent survey

Parents were asked to complete a survey following completion of the second wave of GPS data collection, available in both English and Spanish. Most parents completed the survey in person when picking up their child from school. Parents who were not available at this time received the survey in the mail. A 4-point Likert scale was used to measure parents' perceptions of the impact of the Earn-a-Bike program on their child's confidence, ability, and behavior as related to cycling.

2.4.4. School characteristics

School level race/ethnicity and free or reduced price lunch (FRPL) eligibility were obtained from public data (U.S. Department of Education, 2019).

2.5. Statistical analyses

Descriptive statistics were used to describe the study sample. The GPS data were analyzed for participants with (1) ≥1 valid wear day at *each* time point (n = 19), and (2) ≥1 valid wear day at either the pre or post time point (n = 34). For those with ≥1 valid wear day at each time point, observed values for minutes spent cycling from the pre/post GPS data were summarized for each school using descriptive statistics. For both samples, mixed effects linear regression models were used to investigate changes in time spent cycling, accounting for the nesting of participants within assessment time points and adjusting for school, sex, minutes/day of wear time, and number of weekdays and weekend days. Time by sex interactions were tested to investigate whether changes in time spent cycling differed between boys and girls. Due to the non-normal distribution of the data, time spent cycling was natural log transformed. The values presented were back transformed and multiplied by 7 so they could be interpreted as minutes per week of cycling. The modeling approach described above was also used to investigate changes in overall minutes per day of MVPA in participants with ≥1 valid wear day at each time point. Descriptive statistics were used to investigate when cycling trips occurred, grouped as occurring on weekdays or weekend days and by morning (7am–12pm), afternoon (12pm–5pm), and evening (5pm–10pm). Paired t-tests were used to investigate changes in attitudes/perceptions and self-reported behavior from the pre/post student survey. Frequencies were used to summarize data from the post-only student survey questions and post parent survey. Data were analyzed in SPSS 24.

3. Results

Thirty-eight 5th graders (ages 10–11) were enrolled into the Earn-a-Bike program across the three schools and all 38 participated in the research study. Thirty-seven percent of participants were girls. Race/ethnicity characteristics were similar across the three schools; 47.7% of students were Hispanic, 30.5% were Black, 9.7% were White non-Hispanic, and 12.1% were reported as other, on average. Average FRPL was 99% and was also similar across the three schools.

Thirty-four participants wore the device belt for ≥1 valid day at either time point and 19 participants wore the device belt for ≥1 valid day during both time points. Thirty of the participants with ≥1 valid day at either time point also completed both the pre and post student survey. Twenty parents completed the post parent survey. Sample sizes range from 27-30 for the student survey, and 14–20 for the parent survey due to some items being skipped.

Based on the observed geometric means from the GPS data, minutes spent cycling increased at each of the 3 schools (Table 1). The percent increase ranged from 54% to 119% across schools. The statistical models showed similar results (Fig. 2). When including participants with ≥1 valid wear day at either time point, time spent cycling increased by 8.4 min per week (68% increase; $F[1, 23.7] = 6.49$; $p = .018$). When considering only those with ≥1 valid wear day at both time points, time spent cycling increased by 9.8 min per week (84% increase; $F[1, 18.7] = 8.17$; $p = .010$). Findings did not differ by sex, based on non-significant interaction tests. Minutes per day of overall MVPA did not differ between the pre and post assessment (estimated mean at pre-assessment = 37.5; estimated mean at post-assessment = 34.7; B = -2.8; SE = 3.8; p = .477).

Of the 56 cycling trips observed, only two occurred on the weekdays before 12 p.m. when children commute to school (Table 2). Fifty-nine percent of trips occurred on the weekends, and 27% occurred in the evenings on weekdays.

Based on the student survey, significant increases were observed for the number of days participants reported having ridden a bike in the past week and frequency of reported riding after school and on the weekends (Table 3). There was no increase in reported cycling

Table 1
Raw/observed values by school showing change in time spent bicycling for participants with data at both time points (n = 19).

	Observed mean (SD)[a], bicycling minutes/week		% increase
	Pre	Post	
School 1	10.9 (11.8)	23.9 (19.2)	119%
School 2	17.0 (20.0)	34.8 (25.8)	105%
School 3	8.1 (8.5)	12.4 (12.1)	54%
Overall	11.6 (14.3)	22.6 (19.9)	95%

[a] Geometric rather than arithmetic means and SDs are presented due to the non-normal distribution of the data.

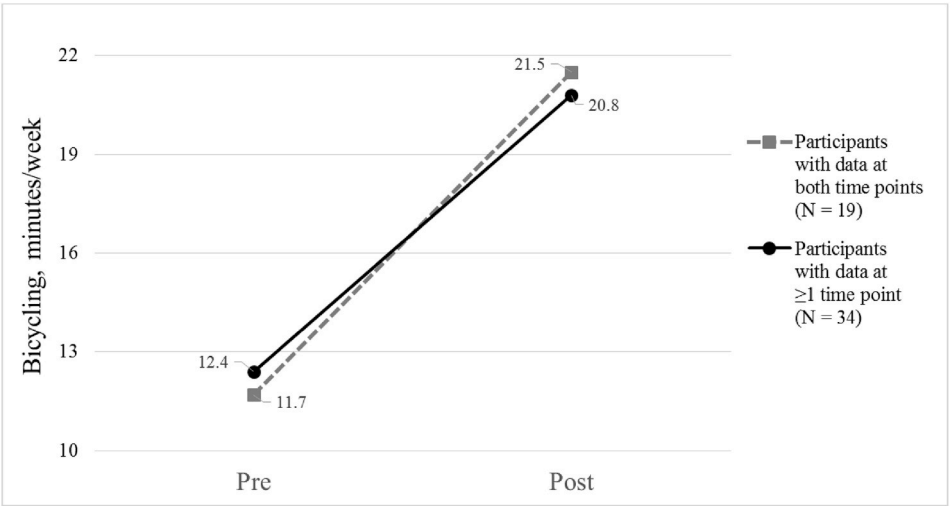

Fig. 2. Model results showing change in time spent cycling.

Table 2
Number of trips on weekdays and weekend days and by time of day.

Trip start	Number of trips
Weekdays	23
7 a.m.–12 p.m.	2
12 p.m.–5 p.m.	6
5 p.m.–10 p.m.	15
Weekend days	33
7 a.m.–12 p.m.	21
12 p.m.–5 p.m.	5
5 p.m.–10 p.m.	7

Table 3
Pre-post results from student survey (n = 27–30).

	Mean (SD)		t	*p*
	Pre	Post		
Number of days rode bike in past week (0–7)	2.17 (2.94)	4.17 (2.82)	-3.35	.002
Frequency of riding bike to/from school (0–3)	.29 (.60)	.36 (.68)	-0.47	.646
Frequency of riding bike after school (0–3)	.54 (.79)	1.25 (.80)	-3.49	.002
Frequency of riding bike on the weekends (0–3)	.72 (.84)	1.45 (.63)	-3.45	.002
Enjoyment of riding bike (1–4)	3.48 (.98)	3.78 (.70)	-1.62	.118
Confidence in riding bike (1–4)	3.45 (.95)	3.62 (.86)	-0.82	.421
Perceived safety when riding bike (1–4)	2.79 (1.23)	2.68 (1.22)	0.47	.640

Table 4
Post-intervention results from parent survey (n = 14–20).

	% of parents who indicated “somewhat agree” or “strongly agree”
My child rides a bike more since Earn-a-Bike	100
My child is more excited to ride a bike since Earn-a-Bike	100
My child will continue to use the bike they earned	100
My child is more active since earn-a-bike	95.0
My child is inside less since earn-a-bike	85.0
My child’s health is improving since earn-a-bike	85.7
My child is more confident riding a bike since doing earn-a-bike	95.0

to or from school, and visual inspection of all GPS bike trips in Google Earth indicated that only one participant appeared to have biked to/from school. Fifty-three percent of student participants perceived that their neighborhood was a safe place to ride their bike, and this perception did not change after completing the program. Student participants reported that the top reasons their child participated in the program were to learn about bike safety (66.7%) and to learn how to take care of a bike (66.7%), followed by to get a bike (60.0%). Parents indicated strong agreement that the Earn-a-Bike program had a positive impact on their child's health, physical activity, and frequency of cycling (Table 4).

4. Discussion

This study found that a bike maintenance program that resulted in earning a bike, paired with a nationally recognized cycling safety curriculum (League of American Bicyclists, 2019a,b) was associated with significant albeit small increases in time spent cycling in participating 10–11 year olds immediately following the intervention. While previous studies have shown such programs can result in increases in knowledge and skills around safe cycling (Chandler et al., 2015; Hooshmand et al., 2014; Lachapelle et al., 2013; Wallace and Sutton, 2015), and self-reported days spent cycling (Sersli et al., 2018), the present study was among the first to objectively assess minutes of cycling before and after the intervention. Taken together, these findings suggest that earn-a-bike cycling education programs appear promising for increasing the currently low rates of cycling and active travel in the U.S. and overall physical activity in youth. Combining such programs with complementary efforts such as bike safety and infrastructure improvements can address multiple critical barriers to cycling in youth and adults.

The percent increase in time spent cycling was large, about 70–80%. Due to the small amount of time spent cycling at baseline, this percent increase corresponded to only an additional ≈9 min per week of cycling and did not translate to an increase in overall physical activity. This amount is low compared to physical activity intervention studies in youth published in the health literature, which have produced an average increase in physical activity of 25 min per week (Metcalf et al., 2012). However, these health interventions are typically of longer duration and more resource-intensive than the week-long Earn-a-Bike, which was delivered after school by a community-based transportation organization. Furthermore, increasing engagement in cycling and other active trip modes (e.g., walking), appears to be particularly important for supporting increases in youth's overall physical activity. This is because evidence suggests that each minute spent in these activities contributes ≥1 min to overall physical activity (Carlson et al., 2017), and that these particular activities distinguish active from insufficiently active youth (Borner et al., 2018). Overall, the present findings suggest that greater increases in cycling are needed to impact overall physical activity. However, the lack of a control group in the present study limits the understanding of the potential impact of increases in cycling on overall physical activity.

Although the Earn-a-Bike program addressed key barriers to cycling, including cycling safety skills/knowledge and bike access, barriers related to neighborhood safety likely limited the program's effectiveness. Safety from traffic and crime are prevalent concerns in relation to cycling and active travel, and children are often more vulnerable to these concerns (Ding et al., 2011). These concerns can be even more prevalent in traditionally underserved communities (Sallis et al., 2011), which were the communities of focus in the present study. Similarly, we found that only half of student participants perceived that their neighborhood was a safe place to ride their bike. Thus, bike education and earn-a-bike programs may result in greater impacts on cycling rates when conducted in safer neighborhoods or combined with neighborhood safety interventions, creating a more multi-level approach. Future efforts, for example, could combine bike programming with broader Safe Routes to School (Safe Routes Partnership, 2019) efforts that address neighborhood safety. Such efforts could also lead to increases in cycling to/from school, which is important to overall physical activity (Larouche et al., 2014) but was not observed in the present study. There are several additional reasons why children in the present study may not have cycled to school, such as distance and bike parking (with a lock, which was not provided in the present study), which could be investigated in future studies.

The earn-a-bike component of the program was likely of critical importance to the program's effectiveness, because children are not able to engage in cycling if they do not have access to a bike. The greater prevalence of lack of bike access in lower-versus higher-income communities (Tandon et al., 2012) was a primary reason lower-income communities were targeted in the present study. Residents commonly report to BikeWalkKC that bikes are often stolen, creating additional barriers. In the Earn-a-Bike program, participants were taught how to properly secure their bike and agreed to keep it in a secure location such as their garage. However, little is known about how long participants are able to maintain the bike in their possession and in working order, so future research is needed in this area. Although receiving a bike was among the top reasons for participating in the Earn-a-Bike program, the two most endorsed reasons were to learn about bike maintenance and bike safety. This was a promising finding because it suggests that participants have long-term interest in using their bike and the behavior change has potential for being sustained.

4.1. Implications for policy and practice

Cycling education programs, particularly when paired with earning a bike, appear promising for increasing rates of cycling in youth. Community-based practitioners should explore methods for scaling up such efforts to increase reach and follow-up engagement activities to support behavior change maintenance. Such programs could complement policy and environmental changes such as cycling infrastructure networks and complete streets, creating multilevel support for increased effectiveness. Policy and environment changes are more likely to be effective in stimulating behavior change if they are paired with effective education and skills-building programs.

4.2. Study strengths, limitations, and future directions

Study strengths included the pre-post evaluation design and use of an objective measure of minutes spent cycling. The lack of a control group limits inference of whether the program can be credited with causing the observed increases in cycling, and whether the lack of difference in physical activity between the pre- and post-assessment was due to factors such as compensation or natural changes in patterns of physical activity (e.g., Physical Education time could have been greater at pre-vs. post-assessment). Excluding children who already have or have access to a bike may have led to a larger increase in cycling attributable to the intervention, because baseline cycling rates would have been lower, but providing such children with a new/properly fitting or their own bike may still support increases in cycling. The somewhat low compliance for wearing the GPS device was a limitation, and is a challenge in community-based program evaluation studies. However, the quality of the GPS data helps offset some of the limitations of having incomplete data, with the main impact being that the findings may not generalize to participants who were not compliant with wearing the device. Children who were excited about receiving a bike likely self-selected into the program, and the afterschool program coordinators hand-selected the students, which limits generalizability of the findings to children who may not self-select into such programs. While increases in cycling were observed the week after participants received their bike, it is unknown whether these increases were sustained over time or diminished (e.g., if due to novelty). As earn-a-bike cycling education programs become more common and larger samples are accrued, it will be important to include longer follow-up time periods and control groups in evaluation studies. Earn-a-bike was a multicomponent program, involving cycling lessons and safety training, bike maintenance training, and earning a bike. We were not able to separate the effects of each component, so the findings should be considered as resulting from the package of components rather than any single component. Although in some circumstance it may be valuable to distinguish the effects of individual components of such programs, having a bike and receiving basic cycling safety training are likely to be core components that are necessary to include in all programs seeking to increase rates of cycling in youth.

4.3. Conclusions

The present study showed that cycling education programs that result in the child earning a bike were associated with significant increases in time spent cycling. Thus, such programs appear promising for increasing the currently low rates of cycling and active travel among youth in the U.S. and many other countries. Child participants and parents valued the program, and the participants' interest in learning bike maintenance and safety skills suggests that the observed increases in time spent cycling may be maintained over time. Pairing such programs with efforts that improve neighborhood safety, thus targeting multiple levels of influence, has potential for leading to greater increases in cycling that are likely to have positive impacts on population health.

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CRediT authorship contribution statement

Jordan A. Carlson: Conceptualization, Writing - original draft, Writing - review & editing. **Chelsea Steel:** Data curation, Formal analysis, Writing - review & editing. **Carolina Bejarano:** Data curation, Writing - review & editing. **Amanda Grimes:** Methodology, Writing - review & editing. **Robin P. Shook:** Methodology, Writing - review & editing. **Ashleigh Reddy:** Data curation, Writing - review & editing. **Maggie Green:** Project administration, Writing - review & editing. **Thomas Morefield:** Project administration, Writing - review & editing. **Laura Steele:** Project administration, Writing - review & editing. **Karen Campbell:** Funding acquisition, Writing - review & editing. **Eric Rogers:** Project administration, Writing - review & editing.

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