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SERVICE-LEARNING PROGRAMS

# A Mastery Motivational Climate-Based Service-Learning Program: Physical and Psychosocial Benefits Among Underserved Children

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## Abstract

*We explored children's physical activity level and psychosocial outcomes in a service-learning program. The program, taught by preservice physical educators, engages children in fun activities within a mastery motivational climate (MMC). Forty-two children in grades K–4 wore accelerometers during two 90-min sessions, resulting in 84 data points. Forty-three children age 8 and up completed a postprogram survey assessing motivational climate, perceived competence, and personal and social responsibility. Of those, 27 completed a presurvey as well. On average, children were engaged in light activity for 38.6% and moderate-to-vigorous activity for 26.0% of the program time.*

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*Social responsibility improved from pre- to postassessment. Children perceived a high MMC, and regression analyses showed that MMC was positively related to perceived competence, personal responsibility, and social responsibility at the end of the program. Results suggest this program was effective in using an MMC to promote social responsibility while engaging students in light, moderate, and vigorous physical activity.*

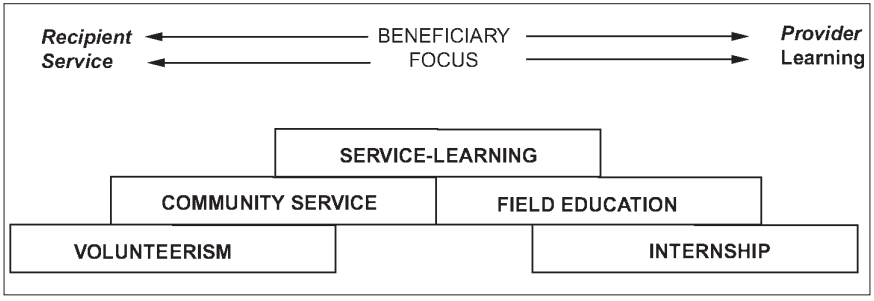
The ultimate goal of physical education teacher education (PETE) programs in the United States is to prepare highly qualified teachers with knowledge, skills, and experiences to promote youth participation in lifelong physical activity. Incorporating service-learning programs within PETE curricula is a salient methodology to enhance preservice teachers' experiences with diverse K–12 students (Domangue & Carson, 2008; Kahan, 1998; Meaney et al., 2008). Service-learning is a dynamic interaction between service providers (e.g., preservice educators) and the community, and this important teaching technique enables university students to apply academic content in authentic settings (Cress, 2005). Much of the service-learning research with children has focused on the benefit to service providers, and little research has investigated benefits for children. Our general purpose was to examine physical activity and psychosocial outcomes among children in a service-learning program led by preservice physical educators.

One pillar of service-learning is reciprocity, whereby service-learning programs are designed not only to enhance university students' knowledge and skills, but also to simultaneously meet significant needs in the community (Cress, 2005). The idea of reciprocity between academia and communities originally developed from Dewey's (1938) work examining the role of citizenship development within higher education. Later, Kolb (1984) modified Dewey's six-step inquiry process to a four-component experiential learning cycle, in which the concept of service-learning began to receive considerable attention. Although Dewey's and Kolb's theoretical frameworks include the critical role of experiential learning in students' development, Furco (1996) expanded this concept to highlight the uniqueness of service-learning programs in blending student and community benefits simultaneously. Reciprocity is a critical component of service-learning that differentiates service-

learning from fieldwork, practicum, and student teaching (see Figure 1). College students are the primary beneficiaries from participation in practicums, fieldwork, and internship experiences, and community members are generally the primary beneficiaries of community service and volunteerism. In service-learning, stakeholders (e.g., faculty, students, community agencies, schools) collaborate on program design to ensure the program benefits the community as well as the college students.

**Figure 1**

*Reciprocal Nature of Service-Learning and Distinctions Among Service Programs*

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Service-learning scholars have used several different theoretical approaches to explore this dynamic pedagogy (Meaney et al., 2016). Social-cognitive theory (Bandura, 1986) provides an optimal theoretical lens to explore the service-learning paradigm via the principal tenet of triadic reciprocity. Triadic reciprocity suggests human learning occurs within a dynamic framework and initiates interaction between one's personal factors, environment, and behaviors. In relation to our purpose, we were interested in how youth in the service-learning program interpret the environment the preservice teachers create and their resultant personal and behavioral factors (e.g., perceived competence, physical activity level). The service-learning environment in this study was purposefully designed to nurture a mastery motivational climate (MMC) while

providing opportunities for physical activity. Nurturing an MMC encourages participants to embrace a mastery goal orientation by attributing success to effort. Moreover, an MMC emphasizes the learning process as opposed to focusing solely on the performance outcome (Ames, 1992). MMCs within physical activity settings can promote enjoyment in physical activity, perceived competence, and physical activity behavior for children and adolescents, whereas a performance motivational climate (emphasis on social comparison and normative standards) is associated with maladaptive outcomes in physical activity settings (e.g., Johnson et al., 2018; Ntoumanis & Biddle, 1999; Parish & Treasure, 2003).

Scholarly investigations of PETE service-learning have consistently shown program benefits for preservice teachers (Cervantes & Meaney, 2013). Findings validate students' enhanced pedagogical content knowledge (Meaney et al., 2009), nurturing of moral reasoning (Cutforth, 2000), and evolution and expansion of their cultural competence for teaching (Domangue & Carson, 2008; Meaney et al., 2008). Investigations examining the impact of participation in service-learning on PETE students have also revealed positive impact on their attitudes and competencies toward children with disabilities (Hodge et al., 2002) and toward neglected and underserved youth (Kahan, 1998).

To date, however, few studies have been purposefully designed to examine the impact of PETE service-learning on community participants (Galvan et al., 2018; Galvan & Parker, 2011). Results from these studies revealed that youth participating in the service-learning programs enhanced their physical skills, fitness, and social interactions. Specifically, Galvan and Parker (2011) reported gains in youth motor skills, teamwork, and cooperation. Youth participants also enhanced their cardiorespiratory endurance, and qualitative findings supported advances in youths' knowledge of nutrition, increased confidence in running skills, and invigorated effort (Galvan et al., 2018). Outside of service-learning programs, studies show that physical education and out-of-school youth development settings can improve youths' psychosocial outcomes, such as self-awareness and social skills (e.g., Anderson-Butcher et al., 2014; Gordon et al., 2016; Hellison & Walsh, 2002). For example, Anderson-Butcher et al. (2014) found that a community sport program, based on the

Teaching Personal and Social Responsibility model, improved social responsibility among vulnerable youth.

Due to the paucity of PETE research examining benefits of service-learning programs for community participants, our purpose was to explore children's perceptions of the motivational climate, their physical activity level, perceived physical competence, and personal and social responsibility in an MMC-based service-learning program. The outcomes we chose reflect the goals of the program. First, the program uses an MMC approach, so we assessed children's perceptions of the motivational climate. Second, the program is designed to teach fun physical activities, so we assessed physical activity level as well as pre- and postprogram perceived physical competence. Third, personal responsibility (e.g, trying hard) and social responsibility (e.g., respecting others) were assessed pre- and postprogram because of the focus on "CPR"—cooperation, participation, and respect. We addressed the following research questions in regard to children participating in this program: (a) Do children perceive a mastery climate? (b) Are children engaging in moderate and vigorous physical activity during the program? (c) Do children's perceived competence and personal and social responsibility improve from pre- to postprogram? and (d) Is a mastery climate positively associated with these psychosocial outcomes? We hypothesized that (a) children would perceive a high level of mastery climate, (b) children would be engaged in moderate-to-vigorous physical activity during the program, (c) perceived competence, personal responsibility, and social responsibility would improve from pre- to postprogram, and (d) perceptions of a mastery climate would be positively associated with perceived competence, personal responsibility, and social responsibility, whereas perceptions of a performance climate would be negatively associated with these outcomes.

## Method

### Description of Service-Learning Program

The service-learning program is designed to provide opportunities for fun and developmentally appropriate physical activities for children in grades K–4 from low-income households in the local community in a medium-sized city in the Southern United States.

Children attend the program either after school in the fall or spring or during the summer. Each session includes 5 days of activities lasting 90 min each day. The program takes place at a Texas State University gymnasium and is taught in conjunction with a physical education teaching methods course for upper-level preservice teachers. The preservice teachers are referred to as "coaches" in the program. On a typical day in the program, children arrive via school bus, are organized in groups by grade, and engage in two physical activity lessons (e.g., a locomotor skill and an object manipulation skill) taught by small groups of coaches. A short break for a healthy snack, a brief closing discussion, and water and restroom breaks are included in the 90 min. CPR (cooperation, participation, respect) is a guiding principle throughout the lessons. On the first day of each program, coaches ask the children what it means to cooperate, participate, and demonstrate respect. After demonstrating their understanding of these principles, students are told they will get to write their name on the CPR board whenever the coaches see them demonstrating CPR. The CPR board served as a reminder and an incentive to be helpful and respectful throughout the program.

The coaches are trained in strategies to create an MMC during the first quarter of the semester, before the program starts. For example, during skill acquisition, children are instructed to use self-referenced goals. In other words, instead of asking the children to outperform their peers, coaches invite them to enhance their own performance (e.g., "Try to throw the beanbag in the Hula-Hoop three more times than you did previously"). To ensure the lessons are instructed via an MMC, the program includes opportunities for children to practice and improve skill acquisition in an enjoyable and noncompetitive fashion that focuses on the learning process as opposed to the product or outcome. Beginning with the warm-up period, the coaches may ask the children to "stretch their arms wide like branches of a tree." As the coaches move through the gymnasium, they comment on the children's effort to create a wide tree and purposefully not comment on which child made the widest tree. The coaches also provide positive reinforcement individually. In a lesson focusing on dribbling, one student may be given a thumbs-up by the coach for dribbling the ball inside the Hula-Hoop, and a child performing at a different skill level may be praised for dribbling the ball

around several Hula-Hoops. As lessons continue, the coaches extend task challenges individually to meet specific needs of students.

Following the instructional and activity period, the coaches review critical elements of the task. In regard to a dribbling lesson, the coaches may ask the children to "touch the part of their hand they should use to dribble the ball." Finally, coaches prompt the children to review their individual adherence to and demonstration of CPR throughout the lesson. The coaches might ask the children to "think about a time during our lesson when you helped your teammate today." The coaches would then reinforce CPR by reiterating whether examples demonstrated cooperation, participation, or respect.

## Participants

Participants in our study included subsamples of those in the service-learning program from a summer (June), fall (October), or spring (February) session. Seventy-one children attended the program in the summer, 47 in the fall, and 50 the following spring. Although many of the fall and spring children were returners to the program, only new children were included in our data samples for each session.

### *Accelerometer Sample*

Boys and girls in the service-learning program were given the opportunity to wear an accelerometer during two days of their session, during program activities. Nine to 12 children at a time wore an accelerometer, and each child who wore a device did so on two days of the program. A total of 84 data points (42 children * 2 days) were obtained from summer ($n$ = 19) and fall programs ($n$ = 23). Children in this subsample were 5 to 10 years old ($M$ = 7.33). Each data point refers to a 90-min period of wear time during one day of the program.

### *Survey Sample*

Boys and girls age 8 and up were asked to complete a pre- and postprogram survey. Children under 8 years old were not included because the survey measures were not valid or appropriate for those ages. In total, 43 completed a postsurvey (46.5% girls), and this sample was used to examine relationships among the variables at the end of the program. Of the 43 children, 25 were in the summer session,

12 in the fall, and 6 in the spring. Sample sizes are smaller than the total number of children in each session because (a) about half of the children were under age 8, (b) some children were absent on the day of the survey, and (c) the fall and spring samples only included new children to the program. Of the 43 children, 27 completed both pre- and postsurveys (48.1% girls; 17 in summer, 8 in fall, 2 in spring; the remaining 16 children were absent or not available for the presurvey), and this sample was used to assess pre- to postprogram change. On average, these children were 9.2 years old ($SD$ = 1.3), and they identified as African American (29.4%), Hispanic (26.5%), White (23.5%), Multiethnic (17.6%), and Other (2.9%). In the past year, 100% of the children had physical education in school and 77.8% played an organized sport; this was important because the presurvey asked children to report on personal and social responsibility in sport or physical education, whereas the postsurvey asked them to report on these behaviors during the service-learning program.

## Measures

### *Accelerometers*

ActiGraph wGT3X accelerometers in this investigation helped us to determine the amount and intensity of physical activity during the program. These devices record movement over three orthogonal axes to evaluate activity level and have been shown to be valid and reliable with children (Pulsford et al., 2011). Participants wore accelerometers on an elastic belt on the hip at approximately the right axillary line. Data were collected at 100 Hz in 10-s epochs. Height and weight (Taylor Precision Products digital scale) were measured for accurate analysis of accelerometer data.

### *Surveys*

Children completed a survey assessing perceived competence and personal and social responsibility before the session started. The postsurvey included those constructs along with perceived motivational climate.

*Perceived competence* was assessed with the physical competence subscale of Harter's (2012) Self-Perception Profile for Children, which has shown good psychometrics with children in Grades 3 to 8. The five items are presented in a structured alternative format.

An example item is "Some kids do very well at all kinds of physical activities BUT Other kids don't feel that they are very good when it comes to physical activities." Children chose which statement was more like them and decided whether the statement was *sort of true* or *really true* for them. Scores ranged from 1 to 4, with higher scores corresponding to higher perceived competence.

*Personal and social responsibility* was assessed with the Personal and Social Responsibility Questionnaire, which was validated with physical education students age 9 to 15 years old and showed good psychometrics (Li et al., 2008). Seven items assess personal responsibility (e.g., I give a good effort; I participate in all of the activities) and seven items assess social responsibility (e.g., I help others; I respect others). Responses are on a 1 to 6 scale (*strongly disagree* to *strongly agree*); however, we modified it to a 5-point scale to be easier for children to interpret (Horn, 2004). At the presurvey, children responded to the prompt "We are interested in how you normally behave during physical activities (sports, physical education class)." At the postsurvey, children responded to a program-specific prompt: "We are interested in how you behaved during [name of the service-learning program]." Thus, change in these constructs would not be a direct measure of pre- to postprogram change, but rather a change in behavior depending on the setting (sport/physical education compared to the service-learning program).

*Motivational climate* was assessed with the Motivational Climate Scale for Youth Sports (MCSYS; Smith et al., 2008) and we modified the word "athletes" to "students." The scale includes six items for mastery and six items for performance climate. A sample mastery item is "The coach tells us that trying our best is the most important thing"; a sample performance item is "The coach spends less time with the students who aren't as good." Youth responded on a 5-point scale ranging from *not at all true* to *very true*. The MCSYS was validated with 9- to 14-year-old sport participants and showed good reliability (Smith et al., 2008).

## Data Collection

Approval from the university's Institutional Review Board was obtained prior to data collection. Program participants were recruited from local housing authorities and after-school programs (e.g., Boys and Girls Club). We coordinated with contacts at each location

to advertise the program, distribute and collect parental consent forms, and arrange transportation. Our sample included youth from summer, fall, and the following spring programs. Child assent was obtained on the first day of the program or a week before the program at a location convenient for them (e.g., housing authority activity center, Boys and Girls Club). At the time of child assent, we also obtained height and weight (all children) and administered the presurvey (children age 8 years and older). Children were weighed by a graduate student or undergraduate student of their same gender and were assured that their information would not be shared with anyone else and that they do not have to share their weight with anyone. Children taking the survey were assured that it was not a test and that responses were confidential ("No one else will see your answers"), and they were encouraged to be honest with their responses. Postsurveys were administered at the end of the last day of the program or within a week of the program's end. Surveys took 10 to 20 min to complete and were administered by researchers or graduate students, not coaches in the program, to help ensure honest answers. On four days of each of the summer and fall sessions (excluding the first day), nine to 12 children wore an accelerometer during program activities. As the children arrived, trained graduate students helped the children fasten the device around their waist and recorded the device's unique number and participant number to ensure accurate data analysis. The accelerometers were initialized to start collecting data at the start time of program activities. After each session concluded, a trained graduate student collected the devices and downloaded the data using ActiLife v6.11.9 (ActiGraph, Pensacola, FL).

## Data Analysis

Accelerometer data, along with participants' gender, height, weight, and birthdate, and the location of the accelerometer (waist) were entered into ActiLife v6.11.9. Data were categorized by the ActiLife software as sedentary, light, moderate, and vigorous physical activity. The combination of moderate and vigorous physical activity (MVPA) was also calculated. These categories are designated according to the metabolic equivalent of task (METs) expended during a given effort. Intensity cut points and values were calculated via the Pulsford children values: sedentary = 0 to 99 counts/min

(CPM), light = 100 to 2240 CPM, moderate = 2241 to 3840 CPM, vigorous = ≥ 3841 CPM (Pulsford et al., 2011). Average minutes and percentage of total time in physical activity were calculated for each category. Survey responses were analyzed using SPSS 24 (Armonk, NY). Preliminary analyses included item analyses and descriptive statistics. Paired *t* tests were conducted and determined change in outcomes from pre- to postprogram ($n$ = 27). Multiple regression analyses were conducted and determined whether perceptions of the climate predicted each postprogram outcome ($n$ = 43).

# Results

## Physical Activity

On average, 35.4% of the 90 wear-time minutes was spent in the sedentary category, meaning that little-to-no movement was occurring. Children were engaged in light physical activity for 38.6% of program time per day, 13.4% of the time was spent in moderate physical activity, and 12.6% of the time was categorized as vigorous activity. On average, students in the service-learning program were engaged in MVPA for 26% of the time, or a total of 23.4 min per 90 min of wear time. Children were engaged in light, moderate, or vigorous physical activity for 64.6% of the 90 min (58.1 min). These total count times equate to a MET rate of 3.4 per 90 min of wear time.

## Psychosocial Outcomes

### *Preliminary Analyses*

Item analyses revealed acceptable internal consistency reliability for mastery climate, performance climate, personal responsibility, and social responsibility ($\alpha > .70$). However, one reverse-scored item on the personal responsibility subscale ("I do not make any goals") had low interitem correlations and was deleted from further analysis. It is possible that the negatively worded item was confusing to children (Horn, 2004). Perceived physical competence showed lower internal consistency (.62 at pre; .63 at post), but this may be influenced by the relatively small sample size, and we retained the scale to carry out our purpose. For overall means, children perceived relatively high levels of mastery climate and personal and social

responsibility. Perceived competence was around the midpoint of the scale, and performance climate was relatively low. Table 1 shows the means for the variables.

**Table 1**
*Means, Standard Deviations, and Effect Size for Change on Survey Variables*

| Variable | Pre *M* (*SD*) | Post *M* (*SD*) | Cohen's *d* |
|---|---|---|---|
| Perceived competence | 2.73 (.62) | 2.81 (.75) | .13 |
| Personal responsibility | 4.10 (.80) | 4.31 (.65) | .27 |
| Social responsibility | 4.08 (.86) | *4.51 (.52) | .66 |
| Mastery climate | — | 4.33 (.72) | |
| Performance climate | — | 2.13 (1.03) | |

*Note*. Perceived competence is on a 1 to 4 scale; all other variables are on a 1 to 5 scale. Cohen's *d* of .2 is a small effect, .5 is a medium effect, and .8 is a large effect.

* $p < .05$.

### *Main Analyses*

In terms of pre- to postseason change, paired *t* tests revealed a significant increase in social responsibility from pre- to postassessment ($p < .05$), with a medium effect size (Cohen's $d = .66$; Cohen, 1988). This means that children reported more often helping and respecting others in the service-learning program compared to a recent physical education or sport program. Perceived competence and personal responsibility remained statistically stable with an increasing trend (see Table 1). Three multiple regression analyses were conducted and determined whether motivational climate predicted each postprogram outcome (mastery and performance climate were independent variables). The models were significant for perceived competence, $F(2, 39) = 3.89$, $p < .05$; personal responsibility, $F(2, 40) = 8.94$, $p < .05$; and social responsibility, $F(2, 40) = 2.78$, $p < .05$ (see Table 2). Mastery climate was significantly and positively related to all outcomes; performance climate did not significantly predict any of the outcomes. This means that when children perceived

their coaches to encourage learning new skills, trying their best, and helping each other learn (i.e., mastery climate), they reported higher physical ability and were more likely to try hard and respect others. The models explained a large amount of variance in each outcome: 41% of the variance in perceived competence, 56% in personal responsibility, and 35% in social responsibility.

**Table 2**
*Standardized Beta Coefficients and* t *Values for Each Dependent Variable in the Regression Analyses*

| | Perceived competence | | Personal responsibility | | Social responsibility | |
|---|---|---|---|---|---|---|
| **Independent variable** | **β** | ***t*** | **β** | ***t*** | **β** | ***t*** |
| Mastery climate | .36 | *2.37 | .51 | *3.67 | .34 | *2.20 |
| Performance climate | -.10 | -0.68 | -.12 | -0.87 | -.02 | -0.12 |

*$p < .05$.

## Discussion

We assessed children's experiences in a service-learning program designed to promote physical activity in an MMC while teaching cooperation, participation, and respect (CPR). Our sample included underserved children, who tend to have fewer opportunities for physical activity (e.g., Lumeng et al., 2006). Results supported our hypotheses that (a) children perceived coaches to create a mastery climate, (b) children were engaged in moderate-to-vigorous physical activity during the program, and (c) greater perceptions of a mastery climate were associated with higher perceived physical competence, personal responsibility, and social responsibility. Results partially supported our hypothesis about improvements in perceived competence, personal responsibility, and social responsibility. Social responsibility increased, indicating children were more likely to help and respect others in the service-learning program compared to recent sport or physical education experiences, but the other two variables remained stable. Taken collectivity, these results show preliminary support that this service-learning program is benefiting youth participants.

Children in the service-learning program agreed that their coaches created a mastery motivational climate by emphasizing the

importance of effort, skill improvement, and cooperative learning. They reported relatively low levels of a performance climate, meaning they did not perceive coaches to punish for mistakes, give more attention to the best students, or emphasize outperforming their peers. Thus, the preservice teachers who had been trained to use a mastery approach did in fact create an MMC during the program, as perceived by the children. The discussion of our findings can be interpreted in the context of this environment.

In terms of physical activity, the Office of Disease Prevention and Health Promotion (2008) recommends 60 min or more of daily physical activity for children, and most of that activity should be moderate or vigorous intensity. While the number of minutes for our participants did not directly meet recommendations, students were engaged in some type of movement for an average of 64.6% of the session time (58.1 min), and 23 of those minutes were moderate-to-vigorous intensity. The service-learning program provided supplemental opportunities for participants outside of their school-based physical education program and other school opportunities (e.g., recess) for play and recreation. This finding is particularly salient given the limited opportunities and barriers (e.g., proximity, safety, affordability) for participation in out-of-school physical activity for many underserved youth (Lumeng at al., 2006; Woodfield et al., 2002). It is important to note the coaches were *preservice* physical educators. The service-learning program occurs prior to the preservice educators' student teaching and entry into their professional career. As such, the coaches were likely attending to other factors (e.g., organization, time on task, behavioral management), so maximizing MVPA is an area for improvement. Lonsdale et al. (2013) conducted a review on physical education interventions designed to increase students' MVPA during a physical education lesson. They noted the small number of rigorous studies but did find evidence that interventions can increase time spent in MVPA during physical education lessons. Effective interventions included professional development focused on classroom management and the addition of high-intensity activities to regular physical education lessons. However, few investigations have explored preservice teachers' influence on children's participation in light, moderate, and vigorous physical activity. One study showed that preservice teachers conducting an MMC program

engaged overweight youth in more moderate bouts of activity compared to the youths' physical education class (Griffin et al., 2013). Utilizing our findings as a teaching tool for preservice educators will be important for identifying strategies to engage children in MVPA.

In terms of change from pre- to postassessment, children reported significantly higher social responsibility, including being kind, helpful, and respectful to peers and coaches, in the service-learning program compared to their usual physical education class or sport practice. After program activities, coaches debriefed the youth so they could share examples of CPR, for instance, "Was there a time today when you saw a student help someone?" These purposeful strategies help explain why social responsibility was higher in this program compared to physical education or sport. Personal responsibility (e.g., trying hard, setting goals) was high and stable across physical education/sport and the service-learning program, indicating the importance of effort and goal-setting in both domains. Children maintained an average level of perceived physical competence (right above the midpoint of the scale). Coaches taught different activities each day of the program; the variety promotes enjoyment, but children may not have had the opportunity for improvement over time. A longer program may be needed to see substantive improvement in perceived ability. For example, Galvan et al. (2018) found that youth in a 10-week PETE service-learning program were perceived by the preservice teachers to have improved in effort and confidence in physical activities. Overall, our participants' increases in social responsibility across settings and their high stable scores for personal responsibility demonstrate the preservice teachers were successful in promoting a climate that nurtures personal and social responsibility, which aligns with the National Physical Education Standards (SHAPE America, 2014).

Regression analyses showed that youth who perceived a higher mastery climate reported higher physical ability (perceived competence), greater effort and goal-setting (personal responsibility), and more helping and respecting others (social responsibility). Perceived competence and personal responsibility are clearly linked with a mastery climate because of the emphasis on skill improvement and effort. Another aspect of mastery climate involves cooperative learning or an emphasis on children helping each other succeed. This

aspect, which is reinforced with the CPR theme (cooperation, participation, respect), helps explain the link between mastery climate and social responsibility. Findings are consistent with research showing a positive relationship between perceptions of a mastery climate in physical education and students' psychosocial and behavioral outcomes, including perceived competence, enjoyment, sportsmanship, persistence, and physical activity (e.g., Ferrer-Caja & Weiss, 2000; Gutierrez & Ruiz, 2009; Johnson et al., 2017; Parish & Treasure, 2003). For example, Johnson et al. (2017) found that middle school physical education students' perceptions of mastery climate dimensions (i.e., effort and improvement, important role) were predictive of greater enjoyment in physical education. In our study, perceptions of a performance climate were not significantly associated with any of the outcomes; it is possible the low mean with small variability contributed to the nonsignificant relationship. Other studies have shown a negative relationship between performance climate and effort, persistence, and physical activity (Ferrer-Caja & Weiss, 2000; Johnson et al., 2017).

Results support social cognitive theory (Bandura, 1986). Children in the service-learning program were engaged in 23.4 min of MVPA per session, on average. Thus, the *environment*, which emphasized an MMC, set the stage for children's physical activity *behavior*. The mastery environment was also significantly associated with children's perceived competence (personal factor) and personal and social responsibility (behavioral factors). Understanding the impact of the environment on learners' personal factors and behaviors is relevant for both preservice teachers and physical education practitioners. The pedagogical strategies teachers infuse during instruction affect students' learning and experiences. Consistent with social cognitive theory, findings from this investigation support the contention that an MMC can help foster children's perceived competence, personal and social responsibility, and participation in physical activity.

Limitations of this study are noted. First, our sample size was small as this was a preliminary investigation of the service-learning program. Our findings provide a step toward moving to a larger scale program. Second, we did not include a control group, so causal inferences are limited. For example, increases in social responsibility could be due to factors not related to the program. A control group

in future research would allow us to draw more rigorous conclusions about program effects. Third, at the presurvey, youth reported personal and social responsibility in a general sense (i.e., "behavior during physical activities"). We did not assess whether their prior sport coaches or physical education instructors used an MMC, which could be helpful when interpreting the pre- to postprogram difference in scores. It may be beneficial for future studies to collect more detailed information on these contexts for comparison. Finally, children under age 8 did not complete a survey, so we were not able to assess psychosocial outcomes for the younger children. Future research could include a pictorial survey or brief interviews to determine their experiences.

In conclusion, our results suggest benefits resulting from the MMC-based service-learning program, including greater socially responsible behavior and participation in light, moderate, and vigorous physical activity. Results also show that when children perceived a higher mastery climate, they reported greater physical ability and higher personal and social responsibility. Results reinforce the psychosocial and behavioral benefits associated with a mastery-oriented environment. Teachers in the program should continue reinforcing skill learning, placing value on giving their best effort, and encouraging cooperation and respect. The partnership between preservice teachers and underserved children in the community, in the form of service-learning, provides a unique opportunity for children to engage in fun physical activities while learning about and demonstrating social responsibility.

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